



Course Approval Form

For approval of new courses and deletions or modifications to an existing course.

registrar.gmu.edu/facultystaff/curriculum

Action Requested:

Create new course Delete existing course

Modify existing course (check all that apply)

Title Credits Repeat Status Grade Type

Prereq/coreq Schedule Type Restrictions

Other: _____

Course Level:

Undergraduate

Graduate

College/School: Department:

Submitted by: Ext: Email:

Subject Code: Number: Effective Term: Fall Spring Summer

Year:

(Do not list multiple codes or numbers. Each course proposal must have a separate form.)

Title: Current

Banner (30 characters max including spaces)

New

Credits: (check one) Fixed Variable

Repeat Status: (check one) Not Repeatable (NR) Repeatable within degree (RD) Repeatable within term (RT)

Maximum credits allowed:

Grade Mode: (check one) Regular (A, B, C, etc.) Satisfactory/No Credit Special (A, B, C, etc. +IP)

Schedule Type Code(s): (check all that apply) Lecture (LEC) Lab (LAB) Recitation (RCT) Internship (INT)

Independent Study (IND) Seminar (SEM) Studio (STU)

Prerequisite(s):

Corequisite(s):

Instructional Mode:

100% face-to-face

Hybrid: ≤ 50% electronically delivered

100% electronically delivered

Special Instructions: (list restrictions for major, college, or degree; hard-coding; etc.)

Are there equivalent course(s)?

Yes No

If yes, please list _____

Catalog Copy for NEW Courses Only (Consult University Catalog for models)

Description (No more than 60 words, use verb phrases and present tense)	Notes (List additional information for the course)
Management of geospatial data by means of a database system. Communication of geospatial data over the Internet using browser-based interfaces.	

Indicate number of contact hours: Hours of Lecture or Seminar per week: Hours of Lab or Studio:

When Offered: (check all that apply) Fall Summer Spring

Approval Signatures

Unit Name	Unit Approval Name	Unit Approver's Signature	Date

Department Approval _____ Date _____ College/School Approval _____ Date _____

If this course includes subject matter currently dealt with by any other units, the originating department must circulate this proposal for review by those units and obtain the necessary signatures prior to submission. Failure to do so will delay action on this proposal.

For Graduate Courses Only

Graduate Council Member _____ Provost Office _____ Graduate Council Approval Date _____

Course Proposal Submitted to the Curriculum Committee of the College of Science

1. COURSE NUMBER AND TITLE:

Course Prerequisites:

GGS550 or approval of instructor

Catalog Description:

Management of geospatial data by means of a database system. Communication of geospatial data over the Internet using browser-based interfaces.

2. COURSE JUSTIFICATION:

Course Objectives:

The goals of this course are to enable students to develop a good understanding of the principles and techniques of spatial databases. Students will learn how to apply these principles and techniques in designing and building a spatial databases; and use spatial databases to perform common types of queries and spatial analyses. In addition, the course prepares students to design, develop, and implement custom web mapping applications using open standards and open source software. Students will learn how to build and deploy a complete web mapping solution including selecting the spatial data, the server and client software. The course will cover a variety of open source software packages for web mapping and will provide pointers to commercial solutions where appropriate.

Course Necessity:

Basic course in management of geospatial data as well as communicating such data using browser-based interfaces and the Internet.

Course Relationship to Existing Programs:

Elective course in the following programs:

- PhD in EARTH SYSTEMS AND GEOINFORMATION SCIENCES
- MS in EARTH SYSTEM SCIENCE (ESS)
- MS IN GEOINFORMATICS AND GEOSPATIAL INTELLIGENCE
- GRADUATE CERTIFICATE IN GEOSPATIAL INTELLIGENCE
- GRADUATE CERTIFICATE IN GEOGRAPHIC INFORMATION SCIENCES

Course Relationship to Existing Courses:

Introduces basic technology underlying GIS software. As such the course is related to GGS553 in that it deals with spatial data and how to store it. However, the approach in this course relates to data management topics, i.e., data modeling, data types, and focusing on developing a Web application for publishing the data.

The course does complement the existing GGS772 course.

3. APPROVAL HISTORY:

Approved by GGS departmental vote, Oct. 20, 2013

4. SCHEDULING AND PROPOSED INSTRUCTORS:

Semester of Initial Offering:

Fall 2014 (the course is offered as GGS590 during fall 2013).

Proposed Instructors:

Dieter Pfoser

5. TENTATIVE SYLLABUS:

see attached pdf.



Department of Geography and GeoInformation Science

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GGS 590
WebGIS
Fall 2013

1. General Information

Instructor: Dr. Dieter Pfoser
Where: Fairfax Campus, Exploratory Hall 2103 (Computer Lab)
When: Wed 7:20pm to 10:00pm.
Course website: Blackboard
Credits: 3.0
Prerequisites: Graduate Students: GGS 550 or permission of instructor.

Instructor's Office Hours: tbd with students

2. Course Objectives

The goals of this course are to enable students to develop a good understanding of the principles and techniques of spatial databases. Students will learn how to apply these principles and techniques in designing and building a spatial databases; and use spatial databases to perform common types of queries and spatial analyses. In addition, the course prepares students to design, develop, and implement custom web mapping applications using open standards and open source software. Students will learn how to build and deploy a complete web mapping solution including selecting the spatial data, the server and client software. The course will cover a variety of open source software packages for web mapping and will provide pointers to commercial solutions where appropriate.

3. Course schedule

The course will be taught as a combination of lectures, topic/problem oriented discussion, and tutorials based on independent reading and class discussion.

4. Textbooks

Required textbooks:

- *Spatial Databases with Application to GIS*. Philippe Rigaux, Michel O. Scholl, Agnes Voisard. Morgan Kaufmann Publishers, 2002. (Available online at GMU Library <http://magik.gmu.edu/cgi-bin/Pwebrecon.cgi?BBID=2818292>)
- *PostGIS in Action*. Regina Obe, Leo Hsu. Manning Publishers, 2011. (Available online at GMU Library <http://magik.gmu.edu/cgi-bin/Pwebrecon.cgi?BBID=2792897>)

Additional readings:

- Selected readings from research journals, technical reports, and other sources will be distributed via the course website.
- *Spatial Databases, a tour*. Shashi Shekhar, Sanjay Chawla. Prentice Hall, 2003 (GMU Library link <http://magik.gmu.edu/cgi-bin/Pwebrecon.cgi?BBID=1030458>)

5. Course outline (tentative)

In this course we will cover the following topics (please note that the topics and their order are subjected to change at the discretion of the instructor, any changes will be announced in class):

Week of	Lec. #	Topic	Assignment
8/28	1	Introduction and overview of spatial databases and Web mapping approaches	
09/04	2	Spatial databases and simple query processing I	Lab 1 (Simple Query Processing)
09/11	3	Spatial databases and simple query processing II	
09/18	4	Data Modeling I	Lab 2 (Data Modelling)
09/25	5	Data Modeling II	
10/02	6	Spatial data types and relationships	Lab 3 (Adv. Query Processing)
10/09	7	Adv. Spatial queries and optimization	
10/16	8	Mid-term, brief introduction to Javascript for Web mapping applications	
10/23	9	Geospatial Web application stack , Rendering maps and delivering spatial data over the Web	
10/30	10	Browser-based mapping and consumption of Web data sources (OpenLayers)	Project assignment
11/06	11	Web services (Web Map Server - WMS, Web Feature Server - WFS)	
11/13	12	Web interfaces implementation	
11/20	13	Web interfaces implementation	
11/27	-	Thanksgiving break	
12/04	14	Project presentations	Final projects due

6. Attendance

You are required to attend all class meetings. Your active participation in the class is essential to the success of this course.

7. Grades

Each assignment and written exam will be given a numerical grade on a 0-100 scale. Some assignments may include bonus tasks. At the end of the term all the marks will be totaled as a weighted average according to the following weights:

Lab assignments	40%
Midterm	25%
Project	35%

Please note that in general all assignments will not have the same weight. The weight of each individual assignment will be indicated on the assignment form. Final grades at the end of the course will be assigned using a **combination of absolute achievements and relative standing in the class**.

8. Exams

The course includes a mandatory written exam. The material covered in the exams will be announced in class. A student who cannot write a course examination or complete a course assignment because of an incapacitating illness, severe domestic affliction or other compelling reasons can apply for extension of time to complete an assignment.

9. Assignments:

The course will include several written assignments on selected topics from the material covered in class and in the assigned reading. Assignments may include tasks such as database queries, analysis of data processing results, and discussion/analysis of theoretical concepts and test cases. All assignments are mandatory. Typically, two weeks will be allocated for every assignment (please see Section 10 for details on late submission policies).

Assignments should be done **through the Blackboard course website**.

Please note: Assignments should be submitted only through the Assignment submission section of the Blackboard system - DO NOT email assignments directly to the instructor.

10. Late lab submission:

Labs submitted **after the due date will not be accepted**. Exceptions to this policy may be made given serious circumstances at the discretion of the Instructor.

Please note: Deferred of term work is a privilege and not a right; there is no guarantee that a deferral will be granted. Please make sure you notify the instructor as soon as you know a deferral is required.

11. Project:

The course will include one project addressing a Web mapping application and including data modeling, data management aspects as well as communicating this data over the Web using the tools and techniques discussed in class. The project will include (i) a written report, (ii) a software demonstrator and (iii) an in-class presentation of the project results incl. a live demonstration.

The specific format and timing of the project will be discussed in class.

The project will be graded based on the following criteria.

- **Academic merit** of your project
- **Quality of the written report.** The project results need to be communicated in a written report. Please remember that your report is a professional document, and should therefore be formatted and constructed accordingly. A template will be made available. Submission of a hardcopy of the report will be made in class; submission of a softcopy (in PDF) will be made through Blackboard.
- **Quality of the demonstrator** as assessed by the instructor and fellow students during the presentation of the project.
- **Quality of the presentations of the project results** as assessed by the instructor and fellow students. Students will be required to present their results in-class. The presentation will include a demonstration of the developed system.

12. Course website:

The course has a Blackboard website. This website will provide you a single portal through which you may obtain lecture notes, retrieve assignment data and, review links to additional materials, and receive special announcements. You are required to visit the course website **regularly**. Please notify ITU (and, if necessary, the instructor) if you encounter any problems accessing this website.

13. Electronic communication:

All course related email correspondence, including submission of assignments, should be made through the course Blackboard website. Please DO NOT send emails to the instructors' @gmu.edu address.

14. Students with special needs:

If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS - <http://ods.gmu.edu>. Please do not hesitate to contact me regarding your special needs if you encounter any problems.

15. Academic integrity:

George Mason University is committed to the **highest standards** of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect. Students are particularly urged to familiarize themselves with the provisions of the GMU honor code (online at <http://academicintegrity.gmu.edu>).

16. General guidelines for ASSIGNMENT preparation and submission

- a. Grades of assignments will be based on:
 - **Academic merit** of your answers.
 - **Conciseness and completeness** of your answers. Please write to the point and explicitly address the question or task. Avoid using unnecessary graphics (figures, tables, graphs etc.) unless they serve a specific purpose. Make sure to use captions and to refer to the graphics you include in your written answer. Graphics without any reference or accompanying explanation will be disregarded.
 - **Organization and presentation.** Remember that your assignment report is a reflection of your thinking and learning process. Please organize your report in a logical fashion so that your answers could be easily identified. A general format for your presentation should, as a minimum, include the following components: (1) Question number, (2) Your written answer and/or description and discussion of your results, and (3) Visualization of your results, e.g. images, graphs, tables, as necessary.
- b. Please remember that your assignment is a **professional document**, and should therefore be formatted and constructed accordingly. All assignments are to be typed. Hand-written assignments will not be accepted.
- c. Submission of a hardcopy will be made in class; submission of a softcopy will be made through Blackboard.
- d. The electronic submission of your assignment report has to be in **PDF format**.
- e. If more than one file is submitted, you may submit a single **ZIP** file containing all the assignment files.
- f. Each assignment submission should include a cover page with the following information: assignment title, assignment number, student name, and submission date.
- g. Please make sure you have a backup of all the materials you submit.

17. Other useful campus resources:

- a. The writing center: A114 Robinson Hall; (703) 993-1200; <http://writingcenter.gmu.edu>
- b. The University libraries "ask a librarian"; <http://library.gmu.edu/mudge/IM/IMRef.html>
- c. Counseling and Psychological Services (CAPS): (703) 993-2380; <http://caps.gmu.edu>

Disclaimer: Any typographical errors in this Course Outline are subject to change and will be announced in class. The date of the final examination is set by the Registrar and takes precedence over the final examination date reported by the instructor.

Note: Recording is permitted only with the prior written consent of the professor or if recording is part of an approved accommodation plan.