

Geography 499

Open Source Geographic Information Technologies

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Class website: <http://www.archaeoworld.com/classes/osgit/>

1 Class Times and Rooms

Tuesdays, 5:30-8:00. Bandelier East 106

2 Office Hours

Tuesdays 4:00-5:30, and by appointment

3 Class Objectives

The objective of this class is to provide an overview of and practical experience with Open Source Geospatial Technologies in solving geospatial problems. The concepts and skills covered will include:

- Open Source software concepts and overview
- Geospatial data types and formats
- Data and service standards
- Geospatial data management (import/export, conversion)
- Data visualization (mapping)
- Automation of geospatial analyses through scripts
- Geospatial data and attribute management within a relational database
- Delivery of geospatial data and maps over the Internet

While a wide variety of Open Source applications will be introduced in the course, the primary focus of the class will be upon the GRASS GIS application, the PostgreSQL database application and spatial extension through PostGIS, and MapServer – an Open Source Internet mapping server.

4 Homework

Over the course of the semester there will be 4 homework assignments that include both theoretical and applied exercises that reinforce the concepts covered in the lectures and in lab. The homework assignments will be posted on the class website. You are encouraged to consult with other students and ask for help with assignments, but you must perform your own work and writeup for all assignments. Late homework assignments will accrue and immediate 10% score reduction when not turned in during the class session in which they are due. An additional 10% reduction will accrue for each additional day delay in turning in the assignment. Electronic homework assignment submissions may be made via email to the instructor's email address (above). The timestamp of the submitted email will be used to determine timeliness.

Students taking the class for graduate credit must also complete an independent project defined in consultation with the instructor. This project will consist of the definition of a specific problem, acquisition and processing of needed data, and generation of output appropriate for the problem being addressed. The product of the project will be a 5-page writeup that will be due during the final class session (5/2).

5 Laboratory Exercises

Weekly laboratory sessions will provide an opportunity to practice the analytic methods described in the lectures, with a close linkage between the laboratory activities and the homework assignments described

above. Class sessions will consist of a combination of lecture and hands-on lab work with the technologies described in the lectures.

6 Course Calendar

Wk.	Dates	Reading	Topic
1	1/17		Class Introduction, Open Source software
2	1/24	Raymond, Stallman (ch. 1,3), Neteler (ch. 1)	Geospatial libraries and utilities
3	1/31	Benedict	Open Standards – W3C and OGC
4	2/7	Neteler (ch. 2,3)	GRASS GIS – Introduction, Data Acquisition and Processing
5	2/14	Neteler (ch. 4)	GRASS GIS – Data import/export, management
6	2/21	Neteler (ch. 5-7)	GRASS GIS – Manipulation and Analysis
7	2/28	Neteler (ch. 8)	GRASS GIS – Visualization and Cartography
8,9	3/7,14	No class	
10	3/21	Review Cooper (ch. 1-8)	GRASS GIS – Automation
11	3/28	Midterm	
12	4/4		PostgreSQL/PostGIS – Database introduction, SQL
13	4/11		PostgreSQL/PostGIS – Geospatial data management, import/export
14	4/18		PostgreSQL/PostGIS – Access by other applications
15	4/25		MapServer – Template based online mapping
16	5/2		MapServer – Enabling OGC services
	5/9	Final Exam, 7:45-9:45 pm	

7 Examinations

There will be two examinations for this course, one mid-term exam and a final. Both the mid-term and final will be hands-on, problem oriented applications of the technical concepts covered in the lectures and practiced in the lab exercises. Make-up exams will only be allowed when an acceptable reason (e.g. documented illness, automobile accident, family emergency) is provided, and the exam can be completed within two days of the originally scheduled exam. In an extreme case, at the instructor’s discretion, an analysis and report specified by the instructor may be substituted for a make-up exam.

8 Grading

All class work will total 300 points. 100 points for each of the two examinations, and 25 points for each of the 4 homework assignments. The grade breakdown will be as follows:

270-300 pts	A
240-269 pts	B
210-239 pts	C
180-209 pts	D
<180 pts	F

+ and – grades will be assigned to the upper and lower thirds of each of the above ranges (except F). If necessary, the final grades may be curved.

9 Course Texts

Neteler, Marcus, and Helena Mitsova (2004). *Open Source GIS: A GRASS GIS Approach*. 2nd Ed. Springer, New York.

Erle, Schuyler, Rich Gibson, and Jo Walsh (2005). *Mapping Hacks, Tips & Tools for Electronic Cartography*. O’Reilly, Sebastopol, CA. (recommended)

9.1 Additional Readings

Benedict, Karl (2005). The Open Geospatial Consortium Web Map, Web Feature and Web Coverage Service Standards - An Overview. Paper presented at the Summer Meeting of the Federation of Earth Science Information Partners. San Diego. June, 2005. Electronic version available from the class website: <http://www.archaeoworld.com/classes/osgit/readings/ogcworkshop.pdf>

Cooper, Mendel (2005). Advanced Bash-Scripting Guide. Online resource accessed 1/2006 at <http://www.tldp.org/LDP/abs/html/>. Electronic copy available on class website at: <http://www.archaeoworld.com/classes/osgit/readings/Advanced%20Bash%20Scripting%20Guide.pdf>

Raymond, Eric S. (2001). The Cathedral and the Bazaar, in *The Cathedral & the Bazaar, Musings on Linux and Open Source by an Accidental Revolutionary*. O'Reilly, Sebastopol, CA. p.p.. 19-64. Electronic version available from the class website at: <http://www.archaeoworld.com/classes/osgit/readings/cathedral-bazaar.pdf>

Stallman, Richard M. (2002). *Free Software, Free Society: Selected Essays of Richard M. Stallman*. Available from the class website at <http://www.archaeoworld.com/classes/osgit/readings/rms-essays.pdf>

additional software documentation highlighted in class.

10 Academic Honesty

From the Student Handbook <http://www.unm.edu/~sac/policies.htm#academicdishonesty>

Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or otherwise fails to meet the standards. Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course. Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.