SIE 510
GIS Applications with Python
Spring 2015

Instructor: Kate Beard
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Course Website: http://www.spatial.maine.edu/~beard/sie_510.htm
Tues and Thur 9:30-10:45 Room 326

Course Objective
The purpose of this course is to investigate theoretical and practical aspects of GIS applications and application development using the Python programming language. The course will review GIS models and operations, various application areas, and dependencies between models and applications. The course will cover the process of application development from requirements analysis to conceptual data modeling, database development, analytical steps and customization. The basics of Python programming will be covered along with specifics of using Python for GIS scripting. Course grades will be based on completion of several lab and programming exercises, presentations and class participation, a midterm exam, and development and completion of an application project.

The application project involves working with a client(s), some level of requirements analysis to determine the client's needs, specification of requirements, and development of application prototypes to serve the client's needs. Projects require a final presentation to the class and clients and submission of a final project report at the end of the semester.

Final project presentations will be during exam week.

Class Presentations: Students are responsible for researching and presenting on one of the designated application areas.

Lab Exercises: Students are responsible for completing several lab exercises. The objective of the labs is to introduce and familiarize you with GIS software and scripting using Python. Labs will use ArcGIS

If you require course adaptations or accommodations because of a disability, please contact the coordinator for Services for Students with Disabilities, Onward Program at 581-2319.

Grading

Class participation/presentations		10%
Lab exercises		20%
Midterm – Take home exam		25%
Final project		45%
Preliminary reports	5%	
Presentation	20%	
Written report	20%	

SIE 510 Approximate Schedule of Lectures and Assignments

Wk	Day	Date	Topic	Reading Assignments	Lab Assignments	Lab Data
1	T	Jan 15	Course introduction	Worboys and Duckham pp 55-65. from, GIS a	Ex 4. Map Design	

				Computing Perspective.		
	TH	Jan 17	Conceptual Modeling	Worboys and Duckham	Ex. 1 Conceptual Modeling	
2	T	Jan 22	Python Fundamentals		Ex 2 Python Programming	
	TH	Jan 24	Relational Databases and Beyond	Worboys and Duckham		
3	T	Jan 29	Normalization	W. Kent	Ex 3 Normalization	
	TH	Jan 31	Python -arcpy: descriptions and			
4	T	Feb 5	Designing effective maps	ArcMap Tutorial	Ex 4. Map Design	
	TH	Feb 7	Python – arcpy working with tools			
5	T	Feb 12	Terrain and hydrological models	Weibel and Heller	Ex 5. Hydro modeling	
	TH	Feb 14	Python – working with text		Ex 6. Python text parsing	
6	T	Feb 19	Network based models	K. Curtin	Ex 7. Linear referencing	
	TH	Feb 21	Python – writing functions			
7	T	Feb 26	Time in GIS	Time in GIS-Peuquet		
	TH	Feb 28	Python – arcpy miscellaneous		Ex 8. Python Data Access Cursors	
	T	Mar 5	Spring Break			
	TH	Mar 7	Spring Break			
	T	Mar 12	Spring Break			
	TH	Mar 14	Spring Break			
8	T	Mar 19	Cadastral Systems			

	TH	Mar 21	Python Topics		Ex 9 Site Location	
9	T	Mar 26	Business Applications			
	TH	Mar 28	Location Based Service Apps		Ex 10	
10	T	Apr 2	Requirements Analysis			
	TH	Apr 4	Projections			
11	T	Apr 9	Web Maps			
	TH	Apr 11	Data Quality			
12	T	Apr 16	Data Quality			
	TH	Apr 18	Metadata			
13	T	Apr 23	Project development			
	TH	Apr 25	Project development			
14	T	Apr 30	Project development			
	TH	May 1	Project Presentations			
15	T	May 7	Final Exam Week (Exam time to be determined		Final Projects due	