Course syllabus for:
GEOG 489
Programming for GIS
Fall, 2015

Course website: https://compass2g.illinois.edu/

Instructor:
Dr. Jonathan Greenberg
259 Computing Applications Building
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Meeting times/locations:
2:00PM - 3:30PM Tuesday and Thursday (338 Davenport Hall)

Office hours: Tuesdays from 3:30pm to 4:30pm in 338 Davenport Hall.

Course Goals:

- To learn the basics of programming using the R statistical computing language.
- To learn to expand GIS capabilities programmatically, including advanced techniques to import, manipulate, analyze, and export geospatial data.

Text Books (optional, but highly recommended):

- Matloff, N. (2011). *The Art of R Programming*. No Starch Press.
- Bivand, R. S., Pebesma, E. J., & Gómez-Rubio, V. (2013). *Applied spatial data analysis with R, Second Edition*. Springer.

Evaluation:

- 13 weekly assignments worth 10 points each.
- Only 10 of the assignments are required, but the first three assignments are **NOT OPTIONAL**.
- If you turn in more than 10 assignments, I will use the 10 assignments you did best on to calculate your grade.
- Total possible score: 100 points.

Plus/minus grades will be given. Minimum guaranteed grade based on percentage:
A: ≥90%; B: ≥80%; C: ≥70%; D: ≥60%; F: <60%

If the mean final percentage for the class is under 75%, I will adjust the final grade such that the mean score is 75%. The curve will be calculated separately for undergraduates and graduates.

Course Outline (Subject to Change):

Week	Topic	Reading
8/25 - 8/27	Introduction, Vectors and Matrices, Debugging	Matloff Ch. 1-3, 13
9/1 - 9/3	Lists, Data Frames, Factors and Tables	Matloff Ch. 4-6
9/8 - 9/10	R Programming Structures	Matloff Ch. 7
9/15 - 9/17	Math, Simulations, and Object Oriented Programming	Matloff Ch. 8-9
9/22 - 9/24	Basic I/O, String Manipulation, and Basic Graphics	Matloff Ch. 10-12
9/29 - 10/1	Code Performance, Parallel Code, Introduction to IDEs	Matloff Ch. 14, 16
10/6 - 10/8	Introduction to GIS in R, Spatial Classes, Visualizing Spatial Data	Bivand et al. Ch. 1-3
10/13 - 10/15	Spatial Data I/O, Basic Vector Geoprocessing, Customizing Spatial Classes and Methods	Bivand et al. Ch. 1-6
10/20 - 10/22	Vector Analysis	Bivand et al. Ch. 7-10
CLASS ON 10/27; NO CLASS ON 10/29	Raster Analyses 1: Basic Raster Math and Parallel Code	TBD
11/3 - 11/5	Raster Analyses 2: Remote Sensing	TBD
11/10 - 11/12	Raster Analyses 3: GLM and GAMs	TBD
NO CLASS ON 11/17 - CLASS ON 11/20	Raster Analyses 4: Local Window Analysis	TBD
11/25 - 11/27	NO CLASS	
12/1 - 12/3	Documentation and Creating R packages for distribution; Version Control Systems	TBD
12/8	Conclusions	TBD