Geog 542 Spatial Statistics
Course Syllabus
Fall 2007

Instructor: Raymond Dezzani
Phone: 208/885-7360
E-mail: dezzani@uidaho.edu
Office Hours: MW 11:00 – 1:00, (or by appointment)
Office: 305C McClure Hall

Instructor: Jerry Fairley
Phone: 208/885-9259
E-mail: jfairley@uidaho.edu
Office Hours: M 4:30 – 5:30, Th 2:30 – 3:30 (or by appointment)
Office: 303A McClure Hall


Course Outline

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8/24</td>
<td>Spatial data analysis (basics), terminology and nomenclature; point vs. area processes/topology models; distance, metrics; map projections &amp; coordinate systems, measurement error.</td>
</tr>
<tr>
<td>2</td>
<td>8/31</td>
<td>Spatial analysis of point patterns/processes; sampling, complete spatial randomness, topology, measure, and tessellation for point patterns.</td>
</tr>
<tr>
<td>3</td>
<td>9/7</td>
<td>Spatial weighting matrices, inverse distance weighting; nearest neighbor statistics, Ripley’s K statistic; quadrat methods and scale analysis</td>
</tr>
<tr>
<td>4</td>
<td>9/14</td>
<td>Random functions/regional variable theory; stationarity, isotropy, homo/heteroscedasticity. Continuous and indicator variables. Measures of spatial correlation: covariance and semivariograms, cross-semivariograms, correlograms, madograms, etc. Acceptable models of spatial correlation, variogram modeling.</td>
</tr>
<tr>
<td>5</td>
<td>9/21</td>
<td>Continuous and categorical variable Kriging: SK, OK, KT, block Kriging</td>
</tr>
<tr>
<td>6</td>
<td>9/28</td>
<td>Kriging (cont’d): co-Kriging</td>
</tr>
<tr>
<td>7</td>
<td>10/5</td>
<td>Simulation Handout mid-term exam (take home)</td>
</tr>
</tbody>
</table>
Spatial analysis of area patterns/processes: areas, polygons, topology; lattice models, tessellation connectivity duals; spatial weighting matrices, stationarity, CSR, spatial dependence.

**MID-TERM DUE.**

Linear algebra review
Measures of spatial dependence: Moran’s I, Geary’s c, other global; Getis-Ord, LISA, other local.

Measures of spatial dependence (cont’d)

Regression models (including GWR, simultaneous auto-regression, and conditional auto-regression); space-time models.

Regression models (cont’d)

Regression models (cont’d)

**Hand out final exam (take home)**

**Fall Recess**

Regression models (cont’d), other topics
Final exam discussion

**Dead week**

**FINAL EXAM DUE**

**Final Exam week**

**Grading:**
Approximately 6 assignments, points divided equally for 60% of overall grade
Mid-term exam 20%
Final exam 20%
Total: 100%

- Reasonable accommodations are available for students who have a documented disability. Please notify your instructor during the first week of class regarding accommodation(s) needed for this course. All accommodations must be approved through Disability Support Services, located in the Idaho Commons Building, Room 306 (phone: 885-6307, email: dss@uidaho.edu).