Passaic County Community College
Science Department
SC 108 – Applications of GIS

Course Syllabus (Fall 2006)

Course Title: Applications of GIS
Catalog / Ref. No.: SC 108
Class Times: Wednesday Evening 5:30-7:50 Lecture, 8:00-9:00 lab (An on-line Component makes up the rest of the lab time)
Room: PCCC Community Technology Center, Room-102B
Prerequisites: Basic computer proficiency and/or instructor permission
Instructor / Office: Dr. William W. Montgomery / New Jersey City University
Telephone / Email: (201) 200-3367 / wmontgomery@njcu.edu
Office Hours: Mondays 8-10 PM through WebCT Chat
For Information: Contact Prof. Mike Mikhaiel at 973-684-6827, Prof. Miriam Rinkerman at 973-684-6034, or Dr. Bill Montgomery at 201-200-3367
WebCT Support: rperdew @pccc.edu; 973-684-5790

Catalog Description: Geographic Information system (GIS) computer technology allows one to store, retrieve, map, and analyze different types of data (scientific, political, cultural, economic, etc.). GIS skills are utilized in a variety of job settings. Students will learn the basic theory behind GIS and be exposed to applications in various disciplines.

Expanded Course Description: Geographic Information Systems (GIS) technology combines mapping with spreadsheet / database storage and computing power, making it an outstanding tool for visualization, analysis, and problem-solving in many disciplines, including environmental science, health science, criminal justice, political science, and business. This course will introduce you to GIS systems: what they are, the kinds of data they need and produce, and ways that objects and data are retrieved, stored, edited, and mapped. We will also examine analytical techniques and evaluate data output (maps, tables, etc.). Lab exercises are a critical part of the course. You will "roll up your sleeves" and learn much about GIS theory by practicing its application. Lab exercises will require independent work outside of class that will entail WEB-based activities supported by WebCT and facilitated by ESRI® ArcGIS software.

Course Objectives / Expected Learning Outcomes: The student will:
- Develop technological competence and improved self-confidence
- Improve critical thinking, analytical, and problem-solving skills
- Develop new knowledge about database development and spatial analysis
- Develop judgment concerning appropriate applications of GIS to problem-solving
- Develop knowledge about the use of GIS in the student’s area(s) of interest
- Develop presentation and communication skills through completion of an independent project to be presented in both written and oral form.

Lab: Ormsby et al, Getting to Know ArcGIS, ESRI Press;
NOTE: For Lab Text, buy NEW TEXT ONLY (6-month software CD included for home use)

Lecture notes, assignments, exercises, and review questions may be found at http://webct.pccc.edu &/or http://faculty.njcu.edu/wmontgomery
Course Calendar (see WebCT Calendar for more details):

<table>
<thead>
<tr>
<th>Week</th>
<th>Start Date</th>
<th>Subject / Task</th>
<th>Read</th>
<th>Asst / or Exam Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>M, 9-04</td>
<td>Install software / Asst01</td>
<td>Ch 1</td>
<td>Review WebCT: welcome, syllabus, calendar</td>
</tr>
<tr>
<td>2</td>
<td>M, 9-11</td>
<td>Start Exr01</td>
<td>Ch 2</td>
<td>Asst01 due W 6 PM; open chat M 8-10 PM</td>
</tr>
<tr>
<td>3</td>
<td>M, 9-18</td>
<td>Spatial Data / Finish Exr01</td>
<td></td>
<td>Open chat M, 8-10 PM</td>
</tr>
<tr>
<td>4</td>
<td>M, 9-25</td>
<td>Spatial Data Model / Asst02</td>
<td>Ch 3</td>
<td>Exr01 due W 6 PM; open chat M 8-10 PM</td>
</tr>
<tr>
<td>5</td>
<td>M, 10-02</td>
<td></td>
<td>Ch 4</td>
<td>Asst02 due W 6 PM; open chat M 8-10 PM</td>
</tr>
<tr>
<td>6</td>
<td>M, 10-09</td>
<td>Attribute Data / Exr02</td>
<td></td>
<td>Exr02 due M 6 PM; open chat M 8-10 PM</td>
</tr>
<tr>
<td>7</td>
<td>M, 10-16</td>
<td></td>
<td>Ch 5</td>
<td>Exm01 &amp; Asst03 due W 6 PM; no chat</td>
</tr>
<tr>
<td>8</td>
<td>M, 10-23</td>
<td>Data input &amp; edit / Exr03</td>
<td></td>
<td>Open chat, M 8-10 PM</td>
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<tr>
<td>9</td>
<td>M, 10-30</td>
<td></td>
<td>Ch 6</td>
<td>Exr03 due W 6 PM; open chat M 8-10 PM</td>
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<tr>
<td>10</td>
<td>M, 11-06</td>
<td>Data Analysis / Asst04</td>
<td>Ch 7</td>
<td>Asst04 due W 6 PM; open chat M 8-10 PM</td>
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<td>11</td>
<td>M, 11-13</td>
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<td>Exr04 due W 6 PM; open chat M 8-10 PM</td>
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<tr>
<td>12</td>
<td>M, 11-20</td>
<td>Analytical Model / Tksgiving</td>
<td>Ch 8</td>
<td>Open chat, M 8-10 PM</td>
</tr>
<tr>
<td>13</td>
<td>M, 11-27</td>
<td></td>
<td></td>
<td>Exr04 due W 6 PM; open chat M 8-10 PM</td>
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<tr>
<td>14</td>
<td>M, 12-04</td>
<td>Focus upon research project</td>
<td>None</td>
<td>Exr02 due W 6 PM; no chat</td>
</tr>
<tr>
<td>15</td>
<td>M, 12-11</td>
<td>Research project / Peer Evals</td>
<td>None</td>
<td>Ppr &amp; Ppt due W 6 PM; open chat M 8-10 PM</td>
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<tr>
<td></td>
<td>M, 12-18</td>
<td>Student Research evaluations</td>
<td>None</td>
<td>Stdnt Ppt Scoresheets due W 6 PM; no chat</td>
</tr>
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Evaluation & Assessment Measures
- 4 exercises @ 40 pts each = 160 pts
- 4 assignments @ 10 pts each = 40 pts
- 2 exams @ 100 pts each = 200 pts
- Research project: 500-word paper & Powerpoint presentation = 50 pts + 50 pts = 100 pts
- Participation: online chat & peer evaluation of Ppt presentations = 50 pts + 50 pts = 100 pts
- Total = 600 pts

Grading System
- Traditional point system modified by bell curve analysis and test score clusters
- +/- 90-100% = A-, A
- +/- 80-89% = B-, B, B+
- +/- 70-79% = C-, C, C+
- +/- 60-69% = D
- < 60% = F

Exercises, Assignments, and Writing Requirements
- 4 exercises involving work with data, with computer programs (MS Excel, MS Word, MS Powerpoint, ArcGIS), and with maps will hone your critical thinking and problem-solving. You will describe your methodology and results in a 250-word (minimum) write-up accompanying each exercise. 4 assignments will test / reinforce conceptual knowledge.

Research Project & Presentation
- For an independent research project, you’ll select a topic that will benefit from GIS mapping and analysis, hopefully a real problem related to your major field of study. You may choose to work in teams of 2 if you find common interest in a problem or issue, and if your project is large enough in scope. A written summary of at least 500 words describing purpose, methodology, data, and results will accompany your maps and data. You will also create a powerpoint presentation that summarizes your work and post it in WebCT for instructor and peer evaluation.
Attendance
16% of your final grade is based upon attendance and class participation, both in-class and online. Attendance is taken at the beginning of each class; be present at the time your name is called or you will receive an unexcused absence. More than 3 unexcused absences from class will result in a drop of one full letter from your course grade. Absences due to work, family, or other scheduling problems will be excused if adequate documentation is provided. Students are also expected to attend at least 10 WebCT open chat sessions that will be held 8-10 PM Mondays.

Expectations of Behavior
- Treat yourself and others with respect – the only dumb question is the one you don’t ask.
- Attend class – you’ll enjoy yourself and earn points too.
- If you miss an exam, you must contact the instructor prior to the exam, document the nature and severity of your illness, and take the exam immediately upon your return to class.
- Integrity is critical in business and in life – cheating on exams will not be tolerated. If you are a party (willing or unwilling) to cheating, your exam score will be zero and you may be subject to academic discipline.
- Plagiarism is a form of cheating; it is theft. There is nothing wrong with using someone else’s work, but you must clearly indicate that it is not yours by referencing the original author and using quotation marks for any writing that is not your own.
- Class sessions should be lively, but disruptive behavior negatively affects the entire class. In these cases, the instructor will request that the disruption cease. If it doesn't, the offending student(s) will be asked to leave the class and will receive an unexcused absence for that class period.
- Cellular telephones: Please turn them off or switch to “vibrate”.

Students with Disabilities:
If you have a disability and believe that you need accommodations, please see a counselor in the Center for Student Success. If you require testing accommodations, please notify your instructor at least one week in advance of the test.