What is “Advanced GIS”? 
This course builds upon the skills and knowledge you acquired during the “Introduction to GIS” course. I prefer to think of “Advanced GIS” as “Advanced and Applied GIS” in the sense that the content of this course is designed to be applicable to your own interests and needs.

Essentially, we are taking GIS beyond merely dealing with specific tasks and problems and extending our application towards larger problems and projects – using GIS as a tool.

We will spend the first few weeks of the semester refreshing our knowledge of ArcGIS and then explore new themes/aspects of GIS, for example joining/relating of attribute tables, map projections, digital elevation models, 3-D mapping, site location analysis, GPS mapping, and georeferencing.

➔ Success in this course depends entirely on your own motivation!

Dates/Times/Location
Monday 16:30 to 18:00 Wilson 139
Wednesday 16:30 to 18:30 Wilson 139

Throughout the semester, it will/may be necessary to meet (occasionally) at different/longer times/locations in order to complete some of the (GPS) mapping and data collection tasks in the field. It may also be necessary (and beneficial) to meet on the weekend.

We will make every effort possible to account/compensate for everyone’s needs and responsibilities when scheduling extra/longer meetings.

Your Instructor
Dr. Carsten Braun (cbraun@wsc.ma.edu 413.572.5595)
Office: Bates 06 (basement, next to the lab room)
Office Hours: MWF, 12:15 to 13:15 (or anytime by appointment)

➔ If you feel that you are not progressing as well as you hoped, please feel free to talk to me during my office hours or a mutually convenient time – the sooner the better! My job is to help you succeed.

Textbook: Getting to Know ArcGIS Desktop (Second Edition)
Basics of ArcView, ArcEditor, and ArcInfo, Updated for ArcGIS 9
Ormsby, Napoleon, Burke, Groess, and Feaster
Available from amazon.com or others ($39.57)
We will not cover every single chapter of this book, but rather focus on selected aspects and themes. This book, however, is an invaluable resource and reference book to supplement the extensive help functions included in ArcGIS.

Each book chapter contains conceptual material followed by scripted software exercises. Readers acquire skills in a variety of areas—map symbology, data overlay, map projection, and data conversion, to name a few—as they make maps and analyze geographic data. The book culminates with a set of spatial modeling exercises using the ModelBuilder technology of ArcGIS version 9. ModelBuilder is a graphical environment for representing, automating, and solving spatial analysis problems.

Included with the book is a fully functioning 180-day trial version of ArcView 9.1 software on CD-ROM, as well as a CD of data for working through the book's exercises. Once installed and registered, the single-use software cannot be reinstalled, and the time limit cannot be extended.

In addition, we will be using three tutorials published by ESRI. These tutorials (and the associated data) are available on each PC and on the server.

1. ArcGIS 9 Getting Started With ArcGIS
2. ArcGIS 9 Using ArcGIS 3D Analyst
3. ArcGIS 9 Using ArcGIS Spatial Analyst

These (and other excellent books and manuals) are also available as hard copies from ESRI (prices vary between $20 and $50 each).

http://store.esri.com/esri/category.cfm?SID=2&Category_ID=27

Other Required Resources

2. A notebook.
3. A three-ring binder to organize notes and hand-outs.

Projects

In addition (and in parallel) to the course schedule (see below), we will be working on six projects over the course of the semester. These projects will form the basis for your evaluation.

Project #1: Review Project
“Getting Started with ArcGIS” (Chapters 4 to 8). The scenario for this project involves finding the best site for a new wastewater treatment plant for the fictitious city of Greenvalley. This project provides an excellent review of the skills and tools learned in the fall. It also introduces you to a range of new tricks and skills, which you can further explore in the other projects.

Start Date: 01/29/2007
Due Date: 03/07/2007
10 percent of your final grade

Project #2: Spatial Analyst Project (Site Location Analysis)
“Using ArcGIS Spatial Analyst” (Exercises 1 to 3). This project and tutorial will introduce you to many of the available tools in ArcGIS Spatial Analyst and will give you a solid basis from which you can start to think about your own specific site location analysis.

Start Date: 03/26/2007 (or sooner)
Due Date: 04/18/2007
10 percent of your final grade
Project #3: Demographics Project
Analyze population demographics for U.S. cities, counties, and states and create a series of choropleth maps depicting population patterns of interest.
Start Date: 02/05/2007
Due Date: 03/07/2007
10 percent of your final grade

Project #4: Digital Elevation Model (DEM) Project
Here, you will create a series of 3-dimensional maps (using a digital elevation model) for towns located in the Westfield River watershed. Topographic maps, aerial photographs, and vector data can be “draped” over a DEM to visualize the landscape in 3-D. In addition, you will derive quantitative topographic data (e.g. slope, aspect, etc.) to serve as a basis for site location analysis.
Start Date: 03/19/2007
Due Date: 04/18/2007
15 percent of your final grade

Project #5: (Group) Mapping Project at WSC
In small groups, we will create an original map of an area of interest on/near campus. We will collect the spatial data using GPS, supplemented by appropriate attribute data. Possible mapping tasks include: mapping the proposed new access road to campus from Route 20, trail mapping/environmental mapping in Stanley Park, mapping the environmental walk along the north side of campus.
Start Date: 04/02/2007 (or sooner!)
Due Date: 05/02/2007
25% of your final grade

Project #6: Your own GIS Project
Anything goes (with prior approval!). You should plan, conduct, and complete this project on your own (exceptions require prior approval!), but you can share resources and skills with other students in the class.
Start Date: asap!
Due Date: 05/02/2007
Project Presentations 05/07 and 05/09 2007
<table>
<thead>
<tr>
<th>Week</th>
<th>Class</th>
<th>Date</th>
<th>Theme</th>
<th>Details / Assignments</th>
</tr>
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<tbody>
<tr>
<td>Week 1</td>
<td>Class 1</td>
<td>1/17 (We)</td>
<td>Course Overview</td>
<td>Monmonier (2005), Ch.1/2/3/4</td>
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<td>Class 2</td>
<td>1/22 (Mo)</td>
<td>“Lying with Maps”</td>
<td>Choropleth maps MA, Ch.5/6/7</td>
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<td>Class 3</td>
<td>1/24 (We)</td>
<td>“Lying with Maps”</td>
<td>Choropleth maps MA, Ch.5/6/7</td>
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<td>Week 2</td>
<td>Class 4</td>
<td>1/29 (Mo)</td>
<td>Review Project I</td>
<td>Finish Ch. 1/2/3/4/5/6/7</td>
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<td>Class 5</td>
<td>1/31 (We)</td>
<td>Review Project II</td>
<td>Finish Ch. 1/2/3/4/5/6/7</td>
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<td>Week 3</td>
<td>Class 6</td>
<td>2/5 (Mo)</td>
<td>Attribute Table Queries I</td>
<td>Ch.8, Demographics Project</td>
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<td>Class 7</td>
<td>2/7 (We)</td>
<td>Attribute Table Queries II</td>
<td>Ch.8, Demographics Project</td>
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<td>Class 8</td>
<td>2/12 (Mo)</td>
<td>Tables: Joins/Relates</td>
<td>Ch.9 + GIS Tutorial</td>
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<td>Class 9</td>
<td>2/14 (We)</td>
<td>Tables: Joins/Relates</td>
<td>Ch.9 + GIS Tutorial</td>
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<td>Week 5</td>
<td>Class 10</td>
<td>2/20 (Tu=Mo)</td>
<td>(Map) Projections I</td>
<td>Ch.13 + MassGIS</td>
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<tr>
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<td>Class 11</td>
<td>2/21 (We)</td>
<td>(Map) Projections II</td>
<td>Ch.13 + MassGIS</td>
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<tr>
<td>Week 6</td>
<td>Class 12</td>
<td>2/26 (Mo)</td>
<td>DEM: Introduction</td>
<td>Mount St. Helens: Before/After</td>
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<tr>
<td></td>
<td>Class 13</td>
<td>2/28 (We)</td>
<td>DEM: Visualization</td>
<td>Using ArcGIS 3D Analyst</td>
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<tr>
<td>Week 7</td>
<td>Class 14</td>
<td>3/5 (Mo)</td>
<td>DEM: Quantification</td>
<td>Using ArcGIS 3D Analyst</td>
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<tr>
<td></td>
<td>Class 15</td>
<td>3/7 (We)</td>
<td>Finish Projects</td>
<td>Project #1 / #3 are due</td>
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<tr>
<td>Week 8</td>
<td>Class 16</td>
<td>3/12 (Mo)</td>
<td>Spring Break</td>
<td></td>
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<tr>
<td></td>
<td>Class 17</td>
<td>3/14 (We)</td>
<td>Spring Break</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Class 18</td>
<td>3/16 (Fr)</td>
<td>Spring Break</td>
<td></td>
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<td>Week 9</td>
<td>Class 19</td>
<td>3/19 (Mo)</td>
<td>MassGIS: DEM</td>
<td>Creating a DEM for Western MA</td>
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<td>Class 20</td>
<td>3/21 (We)</td>
<td>MassGIS: DEM</td>
<td>Creating a DEM for Western MA</td>
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<td>Week 10</td>
<td>Class 21</td>
<td>3/26 (Mo)</td>
<td>Site Location Exercise</td>
<td>Using ArcGIS Spatial Analyst</td>
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<td>Class 22</td>
<td>3/28 (We)</td>
<td>Site Location Exercise</td>
<td>Using ArcGIS Spatial Analyst</td>
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<tr>
<td>Week 11</td>
<td>Class 23</td>
<td>4/2 (Mo)</td>
<td>Mapping with GPS I</td>
<td>Basics of GPS</td>
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<tr>
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<td>Class 24</td>
<td>4/4 (We)</td>
<td>Mapping with GPS II</td>
<td>Data Collection / Attribute Data</td>
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<tr>
<td>Week 12</td>
<td>Class 25</td>
<td>4/9 (Mo)</td>
<td>Mapping from Home</td>
<td>Google Earth, Terraserver, etc.</td>
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<tr>
<td></td>
<td>Class 26</td>
<td>4/11 (We)</td>
<td>Georeferencing</td>
<td>Making new base maps</td>
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<tr>
<td>Week 13</td>
<td>Class 27</td>
<td>4/16 (Mo)</td>
<td>Patriots Day (No class)</td>
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<tr>
<td></td>
<td>Class 28</td>
<td>4/18 (We)</td>
<td>Work on Projects</td>
<td>Project #2 / #4 are due</td>
</tr>
<tr>
<td>Week 14</td>
<td>Class 29</td>
<td>4/23 (Mo)</td>
<td>Work on Projects</td>
<td></td>
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<tr>
<td></td>
<td>Class 30</td>
<td>4/25 (We)</td>
<td>Work on Projects</td>
<td></td>
</tr>
<tr>
<td>Week 15</td>
<td>Class 31</td>
<td>4/30 (Mo)</td>
<td>Work on Projects</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Class 32</td>
<td>5/2 (We)</td>
<td>Work on Projects</td>
<td>Project #5 / #6 are due</td>
</tr>
<tr>
<td>Week 16</td>
<td>Class 33</td>
<td>5/7 (Mo)</td>
<td>Project Presentations</td>
<td></td>
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<tr>
<td></td>
<td>Class 34</td>
<td>5/9 (We)</td>
<td>Project Presentations</td>
<td></td>
</tr>
</tbody>
</table>
Notes on the Schedule

- Adjustments to the course schedule may be required to account for unforeseeable situations during the semester.
- Tuesday (02/20/2007) follows a Monday schedule at WSC.
- Monday (04/16/2007) is Patriots Day holiday in the Commonwealth of Massachusetts. Go to Boston and watch/run the marathon!

⇒ Refer to the Spring 2007 course booklet and academic calendar for more information

The Fine Print...

- Please be on time (i.e. get there before class starts).
- Don’t leave before the end of class.
- Turn off your cell phones.
- Attendance is Mandatory.

⇒ The Three Secrets To Success: (1) Mutual Respect, (2) Shared Responsibilities, and (3) Proactive Communication.

Westfield State College Academic Calendar

<table>
<thead>
<tr>
<th>EVENT</th>
<th>DATE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Martin Luther King’s Birthday (No Classes)</td>
<td>Monday, January 15</td>
</tr>
<tr>
<td>Classes Begin</td>
<td>Tuesday, January 16</td>
</tr>
<tr>
<td>President’s Day (No Classes)</td>
<td>Monday, February 19</td>
</tr>
<tr>
<td>Tuesday follow Monday Schedule</td>
<td>Tuesday, February 20</td>
</tr>
<tr>
<td>Session A Classes End</td>
<td>Friday, March 9</td>
</tr>
<tr>
<td>SPRING BREAK</td>
<td>Monday, March 12 - Friday March 16</td>
</tr>
<tr>
<td>Session B Classes Begin</td>
<td>Monday, March 19</td>
</tr>
<tr>
<td>Patriot’s Day, Observed (No Classes)</td>
<td>Monday, April 16</td>
</tr>
<tr>
<td>Last Day of Classes</td>
<td>Wednesday, May 9</td>
</tr>
<tr>
<td>Exam Period Begins</td>
<td>May 10, 11, 14, 15</td>
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<tr>
<td>Senior Grades Due</td>
<td>Wednesday, May 16</td>
</tr>
<tr>
<td>Commencement</td>
<td>Saturday, May 19</td>
</tr>
<tr>
<td>All Other Grades Due by Noon</td>
<td>Tuesday, May 22</td>
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