Spring 2-1-2020

ANTY 452.01: GIS in Archaeology

Ethan P. Ryan

University of Montana, Missoula, ethan.ryan@umontana.edu

Follow this and additional works at: https://scholarworks.umt.edu/syllabi

Let us know how access to this document benefits you.

Recommended Citation

Ryan, Ethan P., "ANTY 452.01: GIS in Archaeology" (2020). University of Montana Course Syllabi. 11153. https://scholarworks.umt.edu/syllabi/11153

This Syllabus is brought to you for free and open access by the Open Educational Resources (OER) at ScholarWorks at University of Montana. It has been accepted for inclusion in University of Montana Course Syllabi by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.
ANTY 452 – GIS in Archaeology
Spring 2020
Tuesday/Thursday 8:00 am – 9:20 am
Classroom: Social Sciences Rm. 258

Instructor: Ethan Ryan (email: ethan.ryan@umontana.edu)
Office: Social Sciences 216
Office hours: MW 10:00am-12:00 pm or by appointment

Course Description

Archaeology focuses on the study of material culture as a means to explain, examine, and extrapolate about human behavior in the past. This class will examine how Geographic Information Systems (GIS) can be utilized in archaeology by providing the theoretical and methodological background necessary for such research. Focus will be given to (1) gaining a basic understanding of how to utilize ArcGIS, (2) how to use ArcGIS to display, analyze, and present data, (3) how to properly present archaeological data to create informative ethical maps, and (4) utilizing ArcGIS to answer archaeological questions. Students who satisfactorily complete the course will gain an understanding of how a GIS can be used to answer archaeological questions through hands-on experience acquiring data, summarizing results, spatial analysis and producing visual representations/maps.

Course Goals and Learning Outcomes:

- Gain a basic understanding of ArcGIS, mapmaking, spatial analysis, and how best to present spatial data
- Design research strategies to answer theoretical questions within archaeology
- Techniques to acquire and assemble spatial datasets within a study area
- Create, present, and write a conference poster or paper concerning archaeological data
- Understand the underlying principles in archaeological research and geospatial representations

This course requires extensive work using the ArcGIS program. Access to this program will be in-class and is available on campus computers in the library (the “multimedia use computers”) as well as in Stone Hall (Stone 106 Lab). It is highly recommended that you get a copy of the program for your own personal computer by seeing me for a student license for ArcGIS.

Required Readings and Reading Journal:

There will be required readings each week that we will discuss in class and that will relate directly to your GIS exercises. However, I will provide ALL required readings for this course in the form of pdf articles, book scans, digital copies, links, etc. You have enough expenses in other classes. Only purchase books if you want them in your personal library.
In order to pack in all concepts and lessons into a single semester, there will be a required weekly reading journal for the assigned readings. These will be **due at midnight on Monday nights**. The purpose of this exercise is to test students reading comprehension and critical reading skills. The assigned readings will relate to the GIS exercise that will be completed that week, showing you how the field of archaeology approaches spatial issues in the real world.

**Recommended Resources:**

Bodenhamer, David J., John Corrigan, and Trevor M. Harris  

James Conolly and Mark Lake  

Michael Law and Amy Collins  
*3rd edition also fine*

**Grade Determination:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Points</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mid-Term Exam</td>
<td>70</td>
</tr>
<tr>
<td>Final Project</td>
<td>100</td>
</tr>
<tr>
<td>Lab Exercises</td>
<td>120 (10 points each)</td>
</tr>
<tr>
<td>Reading Journal</td>
<td>60 (5 points each)</td>
</tr>
<tr>
<td>Total</td>
<td>350</td>
</tr>
</tbody>
</table>

A 315+ points (90% or greater)  
B 280-314 points  
C 245-279 points  
D 210-244 points  
F < 210 points

**Late Work Policy:**

A point will be deducted each day (from what you score) for late lab exercises and reading journals. Exercises are due the Sunday after the exercise is assigned at midnight. The mid-term and final will not be rescheduled unless reasoning with official documentation is provided (i.e. doctor’s note, SARC note, etc.).
Other Policies

Disability Accommodations: Students with disabilities will receive accommodations in this course. To request course modifications, please contact me as soon as possible as well as talk with Disability Services. For more information, visit the Disability Services website (http://www.umt.edu/dss/) or call (406) 243-2243 (Voice/Text).

Drop Course: February 3rd (5:00pm) is the last day to drop or switch grade mode on Cyberbear without additional fees or instructor permission. March 24th (5:00pm) is the last day to drop or switch grade mode with approval (from myself and your advisor) and a fee – late withdrawals are marked with a “W” on transcript. May 1st (5:00 pm) is the last day to drop, change, or switch grade mode with approval from instructor, advisor, and dean and a fee – these are marked WP or WF on transcript.

Incomplete: An incomplete will only be considered if requested by the student. Typically, this will be granted if a student has missed a substantial number of classes due to documented health or personal problems. Students have one year to complete the course with requirements being negotiated on a case-by-case basis.

Student Conduct: All students are expected to practice academic honesty and should read the Student Conduct Code. Academic misconduct, such as plagiarism, will not be acceptable in this class, regardless of intention. Academic misconduct also includes copying material from another student during an exam, submitting another’s work as one’s own, or allowing someone to copy your work. Academic misconduct will be subject to an academic penalty (receiving a grade of “F”) and/or disciplinary action by the University.

Title IX Policy: The University of Montana is committed to providing an environment that emphasizes the dignity and worth of every member of its community and that is free from harassment and discrimination based upon race, color, religion, national origin, creed, service in the uniformed services (as defined in state and federal law), veteran status, sex, age, political ideas, marital or family status, pregnancy, physical or mental disability, genetic information, gender identity, gender expression, or sexual orientation. Such an environment is necessary to a healthy learning, working, and living atmosphere because discrimination and harassment undermine human dignity and the positive connection among all people at our University. The University will take appropriate action to eliminate, prevent and address the effects of discrimination, harassment, sexual misconduct, stalking and retaliation.

Important Dates

March 10/12 Mid-Term Exam (Due March 12 by midnight)
April 28/30 Presentations
May 8 Final Project Due (by 5 pm)
Class Structure

The class is structured in a way so that students can get the most out of the class without being bogged down by “busy” work. Class will meet Tuesday and Thursday each week. Tuesdays will be comprised of a short discussion about that week’s reading assignment(s), followed by a group critique of each other’s final map(s) from the previous week’s exercise, wrapping up with an introduction of the current week’s assignment. Any remaining time on Tuesday’s will be spent working on the exercise. Each Thursday class period will be spent working on that week’s exercise. This should provide adequate time to finish the GIS assignment each week, though some may need to finish the assignment outside of class.

Reading List and Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Reading</th>
<th>Exercise</th>
</tr>
</thead>
<tbody>
<tr>
<td>January 14/16</td>
<td>Bodenhamer et al. 2010 (Chapter 3)</td>
<td>Exercise 1: Getting to Know ArcGIS</td>
</tr>
<tr>
<td></td>
<td>Conolly and Lake 2006 (Chapter 1/2)</td>
<td></td>
</tr>
<tr>
<td>January 21/23</td>
<td>Bodenhamer et al. 2010 (Chapter 3)</td>
<td>Exercise 2: Working with Coordinate Systems and Projections</td>
</tr>
<tr>
<td></td>
<td>Conolly and Lake 2006 (Chapter 1/2)</td>
<td></td>
</tr>
<tr>
<td>January 28/30</td>
<td>Ristow 1968</td>
<td>Exercise 3: Georeferencing and Digitizing Data</td>
</tr>
<tr>
<td></td>
<td>Conolly and Lake 2006 (Chapter 5)</td>
<td></td>
</tr>
<tr>
<td>February 4/6</td>
<td>Conolly and Lake 2006 (Chapter 4)</td>
<td>Exercise 4: Building Geodatabases and Adding Data</td>
</tr>
<tr>
<td>February 11/13</td>
<td>Schmader and Graham 2015</td>
<td>Exercise 5: Mapping Historic Data</td>
</tr>
<tr>
<td>February 18/20</td>
<td>Gillings 2017</td>
<td>Exercise 6: Viewshed Analysis</td>
</tr>
<tr>
<td></td>
<td>Conolly and Lake 2006 (Chapter 10)</td>
<td></td>
</tr>
<tr>
<td>February 25/27</td>
<td>Bodenhamer et al. 2010 (Chapter 7)</td>
<td>Exercise 7: Data Prep, Buffers, Clips, etc.</td>
</tr>
<tr>
<td>March 3/5</td>
<td>Ullah et al. 2014</td>
<td>Exercise 8: Creating Raster Surfaces, Interpolation</td>
</tr>
<tr>
<td>March 10/12</td>
<td>Midterm/Final Project Workday</td>
<td></td>
</tr>
<tr>
<td>March 17/19</td>
<td><strong>Spring Break</strong></td>
<td></td>
</tr>
<tr>
<td>Date</td>
<td>Text Source and Chapter/Section</td>
<td>Activity</td>
</tr>
<tr>
<td>-------------</td>
<td>---------------------------------</td>
<td>---------------------------------------------</td>
</tr>
<tr>
<td>March 24/26</td>
<td>Conolly and Lake 2006 (Chapter 6)</td>
<td>Exercise 9: Using and Creating Topographic Data (DEM, Contours, etc.)</td>
</tr>
<tr>
<td>March 31/April 2</td>
<td>Supernant 2017 Conolly and Lake 2006 (Chapter 11)</td>
<td>Exercise 10: Least Cost Path Analysis</td>
</tr>
<tr>
<td>April 7/9</td>
<td>Conolly and Lake 2006 (Chapter 8)</td>
<td>Exercise 11: Spatial Analysis</td>
</tr>
<tr>
<td>April 14/16</td>
<td>Bodenhamer et al. 2010 (Chapter 8)</td>
<td>Exercise 12: Web Mapping</td>
</tr>
<tr>
<td>April 21/23</td>
<td></td>
<td>Work on Final Project</td>
</tr>
<tr>
<td>April 28/30</td>
<td></td>
<td>Final Project Presentations</td>
</tr>
</tbody>
</table>

**May 8– Final Project Due**
Reading List

Bodenhamer, David J., John Corrigan, and Trevor M. Harris

Conolly, James and Mark Lake

Gillings, Mark

Ristow, Walter W.

Schmader, Matthew F. and Martha Graham

Supernant, Kisha

Ullah, Isaac I., Paul R. Duffy, and E.B. Banning