University of Wisconsin-Milwaukee
Department of Anthropology

Course #  Title                                               Crts
156-562  Techniques and Problems in Archaeology: Advanced Digital Mapping (U/G)  3

Prerequisite: Anthropology class; Junior standing; Instr cons. A basic understanding of geographic information systems will be useful but not necessary.

<table>
<thead>
<tr>
<th>Instructor</th>
<th>TA</th>
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<tbody>
<tr>
<td>Brian D. Nicholls</td>
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<td>Office Hours: Mon 12:15-2:00</td>
<td>Office Hours: Mon 1-2pm, Fri 12-1pm</td>
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Lecture Time and Location

<table>
<thead>
<tr>
<th>Lecture</th>
<th>Labs</th>
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<tbody>
<tr>
<td>Location: Sabin 149</td>
<td>Location: Sabin 240</td>
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<tr>
<td>Time: Mon 9:30-12:10</td>
<td>Time: Thurs 1:00-3:20pm</td>
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<td>Fri 1:00-3:20</td>
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Course Description

This course is designed to introduce students to basic concepts of surveying, map interpretation, compilation and production. General cartographic principles will be discussed but the course is designed to introduce students to the collection, integration, analysis and display/production of data digitally using GIS.

AN 562 is not intended to replace courses in basic cartography, computer assisted mapping, geographic information systems or plane surveying. However, students will be introduced to interpretation of topographic maps and aerial photographs, basic land surveying principles, and computer based data collection and production of maps.

Course Objectives

Students who successfully complete this course will with the experience in solving common mapping problems. Class participants will be bale to:

1) Read, Interpret and compile maps
2) Use total station to collect data
3) Use GPS to collect data
4) Incorporate historical maps and data into GIS project
5) Produce digital maps and supporting documentation of completed project using ArcGIS, geodatabase, and collected digital data

Required Readings Required readings will be selected from the list provided below and need to be completed before the beginning of each class. Additional readings will be provided on e-Reserve or by the course instructor as needed.

REQUIRED READING LIST
Conolly, J. and M. Lake

McPherron, S. P. and H. L. Dibble

SUPPLEMENTAL READING LIST
Additional readings will be made available throughout the semester.

Assignments and Grading
The course will follow the outline, readings and syllabus provided. Additional topics and readings may be added as deemed appropriate by the instructor based on class interest and need. Several in-class labs will be developed to familiarize participants with GIS software, datasets, and concepts. Grades will be determined based on a combination of lab assignments, class participation, a midterm exam, and completion of a class project. Class participants should be able to complete most of the lab assignments during the allotted class and lab periods.

Class Project: The final class project will consist of a mapping project identified by the instructor. Class participants will employ the topics covered in lecture and lab to aid them in completing the final project. Class participants will work in teams. The majority of the final project data collection will require the students to work outside.

Grades for the course will be determined based on the following:

1. Exam (30% of grade) – There will be one midterm exam for this course.
2. Class participation (10% of grade) – Participation in class discussions provides another means for the instructor to assess an undergraduate student’s understanding of the readings and the lecture material.
3. Lab assignments (40% of grade) – Lab assignments will be given relating to class topics. Lab assignments will assigned during “hands-on” portions of the class and will require use of ArcGIS to complete. In most cases, lab assignments can be completed during the designated class periods.
4. Final class project (20% of grade) – Every undergraduate student is expected to identify and complete a class project to be completed by the end of the semester. Undergraduate students will need to meet with the instructor to discuss individual class projects and present a formal proposal as outlined in the syllabus. Final projects will be in the form of a poster.
Graduate Students

To satisfy the Graduate School conditions for UG/G courses, all graduate students are required to fulfill an additional requirement. Graduate students will also have to produce a presentation of the final project that will include the following:

- Final project map
- Data collected
- Where data was obtained
- What modifications of the data was needed (if any)
- Discussion of analysis conducted
- Problems encountered

Undergraduates may also produce a presentation for 10 extra credit points but must follow the same presentation criteria as the graduate students as indicated above.

Course Outline, Reading Assignments, Exams, and Lab Assignments

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topics</th>
<th>Reading Assignment</th>
<th>Lab Assignment</th>
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</table>
| Week 1 |      | • Course Overview  
|        |      | • Introduction to Maps and Maps in Archaeology  
|        |      | • Locational Systems                            |                         | Lab 1          |
| Week 2 |      | • Topographic Map Interpretation  
|        |      | • Archaeological Survey  
|        |      | • GIS in Archaeology                            | • Conolly and Locke 3   | Lab 2          |
|        |      |                                                  | • Supplemental Readings |                |
| Week 3 |      | • Remote Sensing  
|        |      | • Aerial Photography                            
|        |      | • Satellite Imagery                             | • Lyons and Avery       | Lab 3          |
|        |      |                                                  | • Supplemental Readings |                |
| Week 4 |      | • Remote Sensing – Continued  
|        |      | • Historic Maps and Geo-rectification            | • Supplemental Readings | Lab 4          |
| Week 5 |      | • Spatial Data Acquisition  
|        |      | • Geodatabase Concepts, Development and Design   | • Conolly and Locke 4, 5 | Lab 5          |
|        |      |                                                  | • Arctur and Zeiler 2, 9 |                |
| Week 6 |      | • Geodatabase Concepts, Development and Design   | • Arctur and Zeiler 2, 9 | Lab 6          |
| Week 7 |      | • Archaeo-trigonometry                          | • Greenhood             | Lab 7          |
| Week 8 |      | • Projections and Coordinate Systems             | • Steede-Terry          | Lab 8          |
| Week 9 |      | • Global Positioning Systems                    | • Greenhood             | Lab 9          |
|        |      | • Introduction to Mapping Concepts               | • Fowler and Flick      |                |
| Week 10|      | • Midterm Exam                                   |                         |                |
|        |      | • Total Stations and Data Controllers            |                         |                |
|        |      | • Midterm Exam                                   |                         |                |
|        |      | • Total Stations and Data Controllers            |                         |                |

Week 10 **SPRING BREAK – NO CLASSES**
### Techniques and Problems in Archaeology: Advanced Digital Mapping

| Week 11 | • Mapping Concepts – Continued  
• Total Station  
| Week 12 | • Data Integration with GIS  
| Lab 10 | • Greenhood  
• Fowler and Flick  
|本周12 | • Conolly and Locke 12, 13  
| Lab 11 | • Spatial Analysis  
• Surface and Terrain Models  
| Week 13 | • Spatial Analysis – Continued  
• Networks, Cost paths, Catchments  
| Work on Final Project | • Conolly and Locke 6,7,8  
| Week 14 | • Archaeological Site Mapping  
| Week 15 | • Supplemental Readings  
| Work on Final Project | • Spatial Analysis – Continued  
• Networks, Cost paths, Catchments  
| Week 16 | • Maps and Digital Cartography  
• Maintaining Spatial Data  
| Work on Final Project | • Conolly and Locke 10, 11  
| Week 17 | • FINAL EXAM WEEK  
• Presentations of Projects  
| Final Project due | • Conolly and Locke 12, 13  

### Additional Class Information
- See [http://www.uwm.edu/Dept/SecU/facdocs/1895A.pdf](http://www.uwm.edu/Dept/SecU/facdocs/1895A.pdf) for information UW-Milwaukee course syllabus policy.
- Students are expected to conform to ethical guidelines for all course work. This includes all in-class work as well as written and take home materials. Additional information about the University of Wisconsin-Milwaukee policies and procedures regarding student misconduct may be found at [http://www4.uwm.edu/Dept/Acad_Aff/policy/academicmisconduct.cfm](http://www4.uwm.edu/Dept/Acad_Aff/policy/academicmisconduct.cfm).
- Attendance is required.
- Although some student collaboration is expected, students are expected to attend each class and are responsible for taking their own notes, and are responsible for all partner and group based projects.
- No make-ups will be given without an accepted excuse.