Geospatial Analysis in Archaeology

Listed as:	ANTH 373 TECH ST/ARCHAEOLOGY
Instructors:	Heather Richards Veronica Arias Judith van der Elst
Office:	Bandelier West rm. 206
Office Hours:	Wednesday 1:00 – 2:00 pm- or by appointment
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Class Description

This newly offered class is designed for students interested in applying geospatial technologies, such as Geographical Information Systems (GIS), remote sensing, and Global Positioning Systems (GPS) to anthropological and archaeological research. The class will consist of two components – a lecture and weekly lab exercises. This class provides a general introduction to geospatial technologies, from data acquisition to data integration to spatial analysis (e.g. accessibility and visibility analysis). Data for this class is provided by several New Mexico state agencies and students will work on real-world archaeological projects that will benefit the archaeological community as a whole. It is important in the 21st century to be able to communicate and collaborate with professionals within archaeology and across other disciplines. In order to facilitate student interaction with the New Mexico archaeological community, a proposed forum discussion at the end of this course will give students the opportunity to interact with a wide range of professionals.

Grading

Grading for this course will be based on class participation, weekly lab assignments, weekly evaluation sheets, a project/proposal, and your final portfolio. Lab assignments and evaluations need to be turned in weekly, no late assignments will be accepted as these need to be discussed in lab evaluation sessions.

Participation/Evaluations	25%
Lab Assignments	30%
Project/Proposal	30%
Portfolio	15%

Portfolio

At the end of this course you will have created a portfolio comprised of:

- Weekly lab exercises
- Evaluations of weekly lab exercises
- List of archaeological questions that can be addressed with geospatial methods and techniques
- Useful resources including websites, publications, tutorials, etc.
- Proposal or Project: consisting of your specific research questions, the theoretical background, description of your proposed methods, your proposed data collection, which all will enable you to answer your research question(s)

WebCT

Exercises and reports need to be turned in electronically on WebCT. You will be required to obtain a UNM login in order to access WebCT.

At the end of the course you may choose to turn in your final portfolio as hardcopy or in digital format, either uploaded on WebCT or on a CD.

*Students will be required to purchase 1 CD-R and 1 CD-RW to download data and save lab assignments.

Reading

Required Text: 2002 Wheatley D., and M. Gillings
Spatial Technology and Archaeology: The Archaeological Applications of GIS, Taylor and Francis, London and New York.

Required Readings need to be done before class. Optional Readings are for your information and can broaden your understanding of a specific topic and give you ideas for your proposal. Readings other than the required textbook will be made available online via *ereserves*. Many of these readings will be required, indicated by *(req.)* and a weekly listing of additional required readings will be made available on WebCT. We will also accumulate a list of readings based on class research throughout the semester. Students are encouraged to share their work and findings on WebCT. Any resources and/or data uploaded onto WebCT by students will be considered as Participation.

Data

New Mexico data will be provided to you for this class. Archaeological data is provided by several state agencies in New Mexico. These data should **not** be distributed or published **without permission** from those state agencies.

Scheduled Hours

Our class will meet twice a week, one lecture and one lab session:

Lecture:	Wednesday 2:00-3:00 pm	Hibben 105
Lab:	Friday 2:00-4:50 pm	DSH 143

Attendance is mandatory. Although this course is not a seminar, it is student-oriented and student discussion is strongly encouraged. Attendance to lab is essential to obtaining the varied objectives of this course and obtaining hands-on experience.

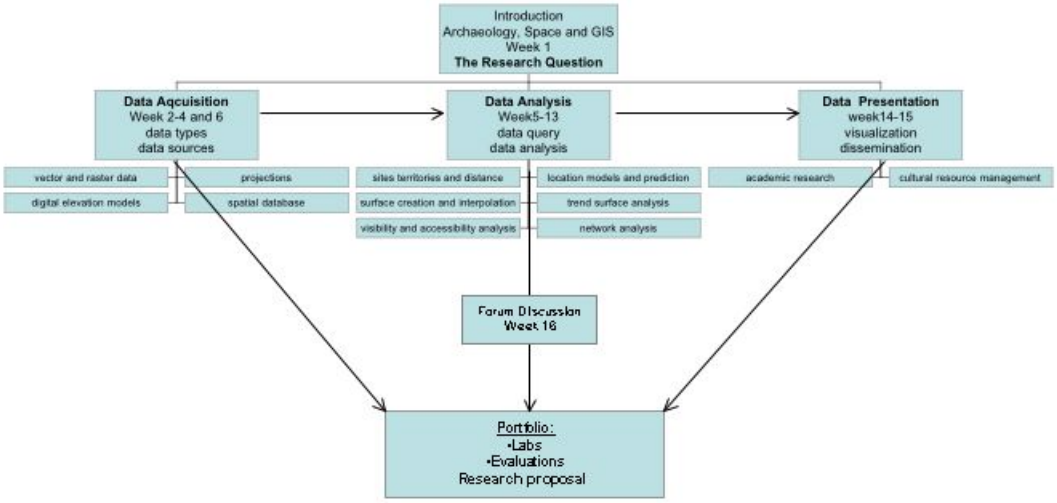
If guest lectures or field trips are scheduled during regular class hours, you are required to attend.

Guest Lecture and Field Trips

Guest lectures and field trips are planned for this class and reports of those will be part of your portfolio. Guest lectures or field trips that are scheduled during regular class hours require attendance. Additional fieldtrips and guest lectures are possible based on available time and interest, these will be discussed in class.

Speakers:	Tim Seaman – former Project Manager at ARMS
Fieldtrips:	Mike Racine – Blue Skies Consulting – ABQ airport

Each student is expected to maintain the highest standards of honesty and integrity in academic and professional matters. The University reserves the right to take disciplinary action, up to and including dismissal, against any student who is found guilty of academic dishonesty or otherwise fails to meet the standards. Any student judged to have engaged in academic dishonesty in course work may receive a reduced or failing grade for the work in question and/or for the course. Academic dishonesty includes, but is not limited to, dishonesty in quizzes, tests, or assignments; claiming credit for work not done or done by others; hindering the academic work of other students; misrepresenting academic or professional qualifications within or without the University; and nondisclosure or misrepresentation in filling out applications or other University records.


Introduction
Archaeology, Space and GIS
Week 1
The Research Question
Data Aqcuisition
Week 2-4 and 6
data types
data sources
Data Analysis
Week5-13
data query
data analysis
Data Presentation
week14-15
visualization
dissemination
vector and raster data
projections
digital elevation models
spatial database
sites territories and distance
location models and prediction
surface creation and interpolation
trend surface analysis
visibility and accessibility analysis
network analysis
academic research
cultural resource management
Forum Discussion
Week 16
Portfolio:
•Labs
•Evaluations
Research proposal

Class Schedule:

Week 1 - Jan19 / 21	**Introduction: Archaeology, Space and GIS** Textbook Reading: Ch 1 Wheatley and Gillings Ereserve Readings: Lock 2003 *(req.)*; Clarke '77; Allen et.al.'90 –ch2; Goodchild & Janelle 2004 – ch1 Intro to WebCT and ereserves Lab 1: see *Assignments* on WebCT
Week 2 – Jan 26 / 28	**What is GIS?** Spatial database – vector and raster data –projections Textbook Reading: Ch 2 Wheatley and Gillings Ereserve Readings: Kwan and Lee 2004 *(req.)*; USGW Projections Lab 2: see *Assignments* on WebCT
Week 3 - Feb 2 / 4	**Acquiring and Integrating Data** Textbook Reading: Ch 3 Wheatley and Gillings Ereserve Readings: McPherron & Dibble 2002- ch9 *(req.)*; McPherron & Dibble 2002- ch2 McPherron & Dibble Lab 3: see *Assignments* on WebCT
Week 4 - Feb 9 / 11	**Remote Sensing: data and Techniques** Textbook Reading: Ch 3 Wheatley and Gillings Ereserve Readings: Sever, 1998: Brooks and Johannes 1990 Lab 4: **Field Trip**: ABQ Airport (Mike Racine)
Week 5 – Feb 16 / 18	**What is Spatial Analysis I** Textbook Readings: Ch 4 Wheatley and Gillings Ereserve Readings: Carlstrom & Cordova 1998 (req.); Daly & Lock 2004; Westcott & Kuiper 2000 Lab 5: see *Assignments* on WebCT
Week 6 – Feb23 / 25	**Digital Elevation Models** Textbook Reading: Ch 5 Wheatley and Gillings Ereserve Readings: Llobera 2001 (req.); Christopherson 2003 Lab 6: see *Assignments* on WebCT
Week 7 – Mar 2 / 4	**What is Spatial Analysis II** Textbook Reading: Ch 4 + 6 Wheatley and Gillings Ereserve Readings: O'Sullivan 2004 (req.); Tobler 1974 (req.) Lab 7: see *Assignments* on WebCT

Week 8 – Mar 9 / 11	**Sites Territories and Distance** Textbook Reading: Ch 7 Wheatley and Gillings Ereserve Readings: Kanter 2004 (req) March 9: Tim Seaman, Guest Speaker Lab 8: see *Assignments* on WebCT
Week 9 - Spring Break	No Class
Week 10 – Mar 23 / 25	**Location Models and Prediction** Textbook Reading: Ch 8 Wheatley and Gillings Ereserve Readings: Ebert 2000 (req.); Church el al. 2000 (req.) Lab 9: see *Assignments* on WebCT
Week 11–Mar 30 /Apr 1	**Surface Creation and Interpolation** Textbook Reading: Ch 9 Wheatley and Gillings Ereserve Readings: Kvamme 1990 (req.) Lab 10: see *Assignments* on WebCT
Week 12 – Apr 6 / 8	**Trend Surface Analysis – Visibility / Accessibility** Textbook Reading: Ch 10 Wheatley and Gillings Ereserve Readings: Maples 2004 (req.) Lab 11: see *Assignments* on WebCT
Week 13 – Apr 13 / 15	**Network Analysis** Ereserve Readings: Goodall et al. 2004 (req.) Lab 12: see *Assignments* on WebCT
Week 14 - Apr 20 / 22	**Visualization and Presentation** Ereserve Readings: Stançic et al. 2002 (req.); Tufte 1983 Lab 13: see *Assignments* on WebCT
Week 15 – Apr 27 / 29	**Cultural Resource Management** Textbook Reading: Ch 11 Wheatley and Gillings Ereserve Reading: Alanen & Melnick 2000 (req.); Hardesty 2000 Lab 14: see *Assignments* on WebCT
Week 16 – May 4 / 6	**Forum** Textbook Reading: Ch 11-12 Wheatley and Gillings
Week 17 – Finals week	Turn in portfolio and proposal/project for final grade