

GIS/Remote Sensing for Archeology and Paleontology
ANT 324L / GRG 356T Fall 2018
Unique 31735, 37190

Course Meets Tu,Th 9:30-11 in RLP 1.402.

Instructor Dr. Denné Reed

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Course Description:

Geographic location plays a key role in our understanding and interpretation of anthropological phenomena from the location of primates under study, to finding hidden and remote archaeological ruins, to mapping the distribution of bones and artifacts in an excavation of field area. Computerized systems for the storage and analysis of spatial data, i.e. Geographical Information Systems, as well as the analysis imagery captured from the air, or space, i.e. Remote Sensing, have become integral components in the data collection and analytical workflows of anthropologists, geologists and paleontologists. This course surveys the most common methods and techniques in spatial analysis and remotes sensing and provides a comprehensive overview of the standard workflows used in spatial analysis. Students will learn the foundations of geospatial science, cartography and image interpretation along with a basic understanding of quantitative spatial analytical techniques.

Main Learning Objective

The fundamental principles of recording, managing and analyzing spatial data

The basic workflows applied to spatial data

Honing problem solving skill using spatial data

Developing comfort and familiarity with specialized software for spatial analysis

Understanding how spatial data is used in archaeology, paleontology and paleoanthropology

Expected Learning Outcomes

Be able to create, load, view, modify and analyze spatial data in raster and vector formats

Be able to interpret and analyze remote sensing data

Demonstrate a comprehension of the basic principles of cartography, computer systems and electromagnetism needed to properly utilize and interpret spatial data and remote sensing data.

Be knowledgeable about where and how to acquire data

Course Structure This course is organized into weekly lab activities. The Tuesday session is generally dedicated to presentation of new concepts and the Thursday session to application of those concepts to solve and complete lab activities. This course emphasizes the development of applied skills.

Prerequisites and Expectations: This is **NOT** an introductory course in GIS and remote sensing. This is an accelerated course in GIS and RS fundamentals. There are no enforced

prerequisites, but students should have a comfortable working knowledge of computers and an introductory GIS or remote sensing course is recommended but not required.

Required textbooks: The following book is required reading for this course. It is available through the University Coop as well as other campus bookstores. It is also available for direct purchase from the author in print or digital form. GIS and RS technology are developing rapidly so the latest edition of the textbook is essential.

Bolstad, P (2016) GIS Fundamentals: A first text on geographic Information systems 5ed., XanEdu: Acton, MA.

Recommended Textbooks:

The following book is recommended for those who are brand new to GIS using ESRI software: Michael Law and Amy Collings (2015) Getting to Know ArcGIS. ESRI Press: Redlands, CA.

Lectures and Lab: We will be using ESRI ArcGIS software and Leica ERDAS Imagine software for remote sensing. Each student will have access to their own GIS/RS workstation during class and in addition students have access to the GIS lab in RLP 3.104 in order to complete assignments out-side of class. The RLP 3.104 lab is open during RLP building hours and requires a UT proximity ID card for entry.

Grading: Grades for this course are based on 11 lab assignments (best 10 applied to grade) (60%) and a midterm (20%) exam, and a cumulative final exam (20%). Grading uses the +/- system. Final grades of A = 100-95, A- = 94-90, B+ = 89-87, B = 86-84, B- = 83-80 etc. Lab exercises are due by 2 PM on Wednesday the week after they are assigned. **Each lab is worth 6 points toward the final grade. Late labs will be penalized 1 point.**

Canvas. In this class we use Canvas—a Web-based course management system with password-protected access at <http://canvas.utexas.edu>—to distribute course materials, to communicate and collaborate online, to post grades, to submit assignments, and to give you online quizzes and surveys. You can find support in using Canvas at the ITS Help Desk at 475-9400, Monday through Friday, 8 a.m. to 6 p.m., so plan accordingly.

Classroom Protocol. Civil and courteous behavior is expected during lectures and labs (It's a good idea outside of class too). Cell phone ringers must be turned off prior to the beginning of lecture.

Honesty. Please pursue rigorous honesty in everything you do, including your work for this class. It will serve you well in life, and in this class as well since we report all cases of suspected academic dishonest to the dean of students. Dishonesty will result at least in a failed grade for the assignment and perhaps also for the course. For a description of academic dishonesty, see http://deanofstudents.utexas.edu/sjs/acadint_avoid.php. For more info, see <http://www.lib.utexas.edu/services/instruction/learningmodules/plagiarism>

Religious Holidays. If you will not be able to attend class due to religious services, let me know at least a week ahead of time. We will make every effort to help you keep up with course assignments in such situations.

Disability Services. Students with documented disabilities may request appropriate academic accommodations from the Division of Diversity and Community Engagement, Services for Students with Disabilities, 471-6259. Please let me know about any arrangements we can make that will assist you in your learning.

Behavior Concerns Advice Line (BCAL). If you are worried about someone who is acting differently, you may use the Behavior Concerns Advice Line to discuss by phone your concerns about another individual's behavior. This service is provided through a partnership among the Office of the Dean of Students, the Counseling and Mental Health Center (CMHC), the Employee Assistance Program (EAP), and The University of Texas Police Department (UTPD). Call 512-232-5050 or visit <http://www.utexas.edu/safety/bcal>

Resources for Learning & Life at UT Austin. The University of Texas has numerous resources for students to provide assistance and support for your learning.

- Sanger Learning and Career Center: <http://lifelearning.utexas.edu/>
- Undergraduate Writing Center: <http://uwc.utexas.edu/>
- Counseling & Mental Health Center: <http://cmhc.utexas.edu/>
- Career Exploration Center: <http://www.utexas.edu/student/careercenter/>
- Student Emergency Services: <http://deanofstudents.utexas.edu/emergency/>

Use of E-Mail for Official Correspondence to Students. E-mail is recognized as an official mode of university correspondence; therefore, you are responsible for reading your e-mail for university and course-related information and announcements. You are responsible to keep the university informed about changes to your e-mail address. You should check your e-mail regularly and frequently—we recommend daily, but at minimum twice a week—to stay current with university-related communications, some of which may be time-critical. You can find UT Austin's policies and instructions for updating your e-mail address at <http://www.utexas.edu/its/help/utmail/1564>

Emergency Evacuation Policy. Occupants of buildings on the UT Austin campus are required to evacuate and assemble outside when a fire alarm is activated or an announcement is made. Please be aware of the following policies regarding evacuation: Familiarize yourself with all exit doors of the classroom and the building. Remember that the nearest exit door may not be the one you used when you entered the building. If you require assistance to evacuate, inform me in writing during the first week of class. In the event of an evacuation, follow my instructions or those of class instructors. Do not re-enter a building unless you're given instructions by the Austin Fire Department, the UT Austin Police Department, or the Fire Prevention Services office.

Q drop Policy. Texas law limits the number of course drops for academic reasons to six. Senate Bill 1231 says: "Beginning with the fall 2007 academic term, an institution of higher education may not permit an undergraduate student a total of more than six dropped courses, including any course a transfer student has dropped at another institution of higher education, unless the student shows good cause for dropping more than that number."

Overview: The schedule below is a general outline and is subject to change. Please consult the online schedule on the Canvas website for the most up-to-date version.

Date	Topic
30 Aug.	Course Introduction
5-6 Sept.	How does this thing work? Software and hardware overview and setup
11-13 Sept.	Where am I? Locations and coordinates on earth
18-20 Sept.	Paint me a picture. Principles of cartography and map design
25-27 Sept.	Let's build it! Creating spatial datasets
2-4 Oct.	<i>Midterm Exam</i>
9-11 Oct.	Let's fix it! Modifying spatial data
16-18 Oct.	Who has what? Asking questions of your data
23-25 Oct.	What is that? Foundations of image interpretation
30 Oct. - 1 Nov.	Siri, what is that? Foundations of image classification
6-8 Nov.	How high is up? Interpreting Topography
13-15 Nov.	Where is it? Answering questions with spatial data
20-22 Nov.	Thanksgiving
27-29 Nov.	Where should I ... ? Introduction to and Suitability Analysis
4-6 Dec.	<i>Review and Final Exam</i>