**FWCE 471/571: Geographical Information Systems for Natural Resource Scientists**

**Fall 2016, 4 Credits**

Instructor: Dr. Eric Salas

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Office hours: Please make an appointment

Lecture: Mondays and Wednesdays, 2.35 to 3.50 pm, Gerald Thomas 337

Lab: Mondays and Wednesdays, 4.00 to 6.00 pm, Gerald Thomas 338

TA: Stephanie Muise (smuise91@nmsu.edu)

**Course Goals**

To build a working knowledge of ArcGIS software and to apply GIS to your own specialist field.

**Course Objectives**

The course is designed for students with little to no GIS experience. The primary objective is to help you form a good understanding of how to work with digital geographic data. Using ArcGIS 10.3, you will develop the skills to locate and display spatial data, to edit existing data and to create new data sets. You will learn how to manage and display multiple data layers in an ArcGIS map document. You will also learn how to manage raster, vector and attribute data in geodatabases. The class uses real data from the natural resource fields so that you can discover where to find data and gain knowledge of the appropriate methods for data storage, editing, processing and analysis. Further, through encountering the imperfections of real world data, you will develop an appreciation of the problems associated with using geographic data and the importance of accurate and complete metadata.

**Course materials**

There are no specific books for you to purchase for this class. Various resources have been used in the preparation of class materials and these are listed below. It is strongly recommended that you read as much as possible to support lecture notes and practical lab work. Additional reading will be required to help you answer the question/s in our Short Session Test (SST).

You may read any GIS book, but here are few references:

Albrecht, J., 2007, Key Concepts and Techniques in GIS, Sage Publications, London, UK.

Clenner, G., 2010. The GIS 20: Essential Skills. ESRI Press, Redlands CA.

DeMers, M.N., 2003, Fundamentals of Geographic Information Systems, John Wiley and Sons, NJ.

Heywood, I., Cornelius, S. and Carver, S., 1998, An Introduction to Geographic Information systems, Prentice-Hall, UK

Iliffe, J., and Lott, R., 2008, Datums and Map Projections for GIS and Remote Sensing. Whittles publishing / CRC Press, FL.

Kennedy, M., 2009, Introducing Geographic Information Systems with ArcGIS: A Workbook approach to Learning GIS, John Wiley and Sons, Hoboken, NJ.

Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W., 2005, Geographic Information Systems and Science, Wiley, Chichester, UK.

Lloyd, C., Mitchell, A., 1999. The ESRI Guide to GIS Analysis: volume 1: Geographic Patterns and Relationships, ESRI Press, Redlands, CA.

Lloyd, C., 2010, Spatial data analysis : an introduction for GIS users, Oxford University Press, NY.

Ormsby, T., Napolean, E., Burke, R., Feaster, L. and Groessl, C., 2004, Getting to Know ArcGIS, ESRI Press, Redlands, CA.

Sheklar, S. and Xiong, H., 2008, Encyclopedia of GIS, Springer Reference, New York, NY.

Skidmore A. (Ed.), 2002 Environmental Modelling with GIS and Remote Sensing, Taylor and Francis, London, UK.

Verbyla, D.L., 2002, Practical GIS Analysis, Taylor and Francis, London, UK. EBOOK through NMU library.

Wise, S., 2002, GIS Basics, Taylor and Francis, London. UK. EBOOK through NMU library.

**Megasites**

The GeoCommunity: <http://www.geocomm.com>

GIS.com: The guide to Geographic Information systems: <http://www.gis.com>

GisCafé.com: <http://www.giscafe.com>

GISLounge: <http://gislounge.com>

**Required Supplies**

You will need a flash drive or external hard drive with at least 4 GB of free space.

**Disability and Accommodations Policy**

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act Amendments Act (ADAAA) covers issues relating to disability and accommodations. If a student has questions or needs an accommodation in the classroom (all medical information is treated confidentially), contact:

Trudy Luken, Director

Student Accessibility Services (SAS) - Corbett Center, Rm. 244

Phone: (575) 646-6840 E-mail: sas@nmsu.edu

Website: <http://sas.nmsu.edu/>

NMSU policy prohibits discrimination on the basis of age, ancestry, color, disability, gender identity, genetic information, national origin, race, religion, retaliation, serious medical condition, sex, sexual orientation, spousal affiliation and protected veterans status. Furthermore, Title IX prohibits sex discrimination to include sexual misconduct: sexual violence (sexual assault, rape), sexual harassment and retaliation.

For more information on discrimination issues, Title IX, Campus SaVE Act, NMSU Policy Chapter 3.25, NMSU's complaint process, or to file a complaint contact:

Gerard Nevarez, Title IX Coordinator

Agustin Diaz, Title IX Deputy Coordinator

Office of Institutional Equity (OIE) - O'Loughlin House, 1130 University Avenue

Phone: (575) 646-3635 E-mail: equity@nmsu.edu

Website: <http://eeo.nmsu.edu/>

Other NMSU Resources:

NMSU Police Department: (575) 646-3311 [www.nmsupolice.com](http://www.nmsupolice.com)

NMSU Police Victim Services: (575) 646-3424

NMSU Counseling Center: (575) 646-2731

NMSU Dean of Students: (575) 646-1722

For Any On-campus Emergencies: 911

**Course policies**

*Class preparation*

It is your responsibility to obtain material for lectures and labs. All materials will be available for download from the class Canvas site at least 24 hours before the lecture / lab.

*Submitting lab work*

It is your responsibility to ensure that you have handed in all your lab work. **All lab work must be submitted through Canvas** (unless otherwise instructed in the lab materials). Canvas keeps track of any work you submit - or resubmit. You must check to see that your work uploads correctly. **All work is expected by the due date on Canvas**. You will lose 1 point for every day that your work is late. In exceptional circumstances (such as medical or family emergency), you may hand in work late without penalty.

*Reading Assignment*

Reading assignments (RA) are given every Wednesday. You are required to read articles published in peer-reviewed journals. A summary report has to be submitted by Monday.

*SST*

Short session tests (SST) are another form of assessment that are given before the start of the lecture session on Mondays. The questions will be mostly based on reading materials and some lecture or lab materials.

*Plagiarism*

Plagiarism (including but not limited to copying work from other students, books, articles or the internet) will not be tolerated. Plagiarism and cheating will be penalized according to the student code of conduct.

**IMPORTANT DATES FOR FALL 2016**

Holiday on Labor Day: Monday, September 5

Midterm exam: Wednesday, October 5: 3.30 pm – 5.00 pm

Last day to drop with a ‘W’: Monday, October 17

Last Day to withdraw from the University: Friday, November 11

Thanksgiving holiday for students: Monday – Friday, November 21-25

Final Project/Short presentation: Monday, December 5: 3.30 pm – 5.00 pm (Undergrad)

 Wednesday, December 7: 3.30 pm – 5.00 pm (Grad)

**Grading**

There are four components to your grade for this class: lab work, homework, the midterm and the project.

* The lab exercises are designed to help you develop the GIS techniques and knowledge. For undergraduate students, the labs are worth 50% of the final grade. For graduate students, labs are worth 40% of the final grade.
* SSTs are worth 15 % of the final grade
* RAs are worth 5% of the final grade
* Your midterm is worth 15% of the final grade. The midterm must be taken in class, no exceptions
* For undergrad, your final is worth 15 % (10% Presentation + 5% Report) of the final grade
* For grad, your final is worth 25 % (15% Presentation + 10% Project Report) of the final grade
* BONUS POINTS (max 20 points)

Grade A: 90 -100%

Grade B: 80 – 89.9%

Grade C: 70 – 79.9%

Grade D: 60 – 69.9%

Grade F: 0 - 59.9%

If your grade is borderline, your performance throughout the semester will be assessed. Attempting all labs, no late submissions and a good attendance record will indicate your grade should be raised to the next bracket.