

*Department of Society & Conservation Graduate Course – Spring 2022*

**Basic GIS for Environmental Social Scientists**

NRSM 595 Spring Semester Course Syllabus

2 credits, CRN# 34500

Thursday 3:30-5:20pm; Stone Hall (STON) 107

**Instructor:** Sapana Lohani, Ph.D.

**Office:** Room SC 405B, Charles H. Clapp Building (CHCB)

**Office Hours:** Wednesdays 10am to noon. (Email for Appointment other than office hours).

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***Course Description:***

The goal of this graduate seminar is to provide graduate students in the environmental social sciences with a basic hands-on experience in the application of Geographic Information Science (GIS) and technology to produce a variety of deliverables such as professional images for publication, basic analyses of spatial data, and more. The course is designed for students who may use GIS professionally throughout their careers but are not interested in becoming GIS specialists. Graduate students are encouraged to enroll in the course with little to no GIS experience, and will leave with maps, visualizations, and/or analyses relevant to their theses or dissertations. The course will be more impactful for students if a desired product is envisioned (i.e., map of a case study area to use in their thesis) prior to enrolling. Students do not need to collect spatial data prior to enrolling. The instructor will provide basic GIS instruction using the ArcGIS technology suite, as well as help coach students through exploration of their individual data and progress toward product development. The focus of this course will be on spatial data analysis and visualization for environmental social scientists but interested students in biophysical disciplines will find the course useful for basic geospatial data projects and visualizations.

**References (Optional Reading):**

Campbell, J. and M. Shin (2016). *Essentials of Geographic Information Systems*.

Jensen, John R. and Ryan R. Jensen (2013). *Introductory Geographic Information Systems*.

**Objectives:**

Upon completion of the course, students will be able to:

- Develop and manage geospatial data
- Conduct spatial and logical queries on geospatial data
- Describe and communicate analytical results of geospatial analyses to a non-technical audience
- Demonstrate a working knowledge of GIS software capabilities
- Design informed field data collection and management techniques

**Assignments:**

This course will consist of weekly labs with graded assignments and a final project. Each week, students may or may not finish labs within the class time. Lab assignments are always due by the beginning of the next lab period (i.e., you have one week to complete the assignment). If a lab assignment is not submitted by the end of the next lab period it is considered late, unless you have sought and received permission from the instructor prior to the lab period.

Project work includes a term project where each student is expected to use GIS tools to develop a geodatabase and perform certain GIS analysis to answer specific objectives. Students are expected to submit a project proposal by the end of 4<sup>th</sup> Class. Project proposal is a document with the title and a brief proposal (objectives, methods, and expected outcomes) of what each student plans to do. Please meet the instructor (at least once) and discuss the project topic before submitting the proposal. Project works will be shared with the class via different forms of presentations (power point / story map / ArcMap / Model builder / other) on the last two lab sessions for the course. Final project document will be submitted in the form of a word/pdf document that briefly describes the topic, objectives, methods, results, discussion and conclusion.

**All assignments must be submitted by 8:00 pm on the last day of class (May 5, 2022) in order to be graded.**

**Late Work Policy:**

In general, submitting **laboratory assignments** after the specified due date is not considered acceptable for university students. Late labs will be penalized as follows:

- 1 day late -- evaluated points MINUS 10%
- 2 days late -- evaluated points MINUS 20%

Late work will NOT be accepted more than two weekdays past the due date unless prior permission from the instructor is granted. In cases of personal challenges or excused university absences, this policy can be extended only by prior arrangement with the instructor. **Please talk to your instructor first and make necessary arrangements before missing any class.**

**Evaluation (Grading Scale & Points):**

This class is graded on the traditional A – F letter grade scale only; it is not offered under the credit/no credit option. Upon completion of the course, your points earned on lab assignments and project work will be expressed as a percentage of total points possible in the course and translated into the following grading scale:

<b><i>Grading scale</i></b>	<b><i>Points available</i></b>	
A	93-100%	Lab 1: 10 points
A-	90-92%	Lab 2: 10 points
B+	87-89%	Lab 3: 10 points
B	83-86%	Lab 4: 10 points
B-	80-82%	Lab 5: 10 points
C+	77-79%	Lab 6: 10 points
C	73-76%	Lab 7: 10 points
C-	70-72%	Lab 8: 10 points
D	60-69%	Lab 9: 10 points
F	59% and below	Lab 10: 10 points
		Project: 100 points (Project Proposal 20 / Final Report 80 points)
		<b><u>Course total: 200 points</u></b>

Problems will be graded based on: completeness and correctness of answers, neatness, and discussion. An assignment answer sheet (Word Document) will be placed in the data folder for each assignment.

**Respect, Inclusiveness and Diversity of Thoughts, Ideas and People:**

In teaching courses, I believe and act upon the idea that all students are entitled to and deserve respect, courtesy and tolerance, regardless of their race, background, religious affiliation, gender, sexual preference, disability or any other perceived difference. Likewise, faculty, staff and fellow students deserve the same treatment from other students. Therefore, within the bounds of my courses and professional responsibilities as a university instructor, I make every effort to promote and create a safe space for diverse thoughts, regardless of the form of communication. I ask that you do the same.

**Academic Honesty:**

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the [Student Conduct Code](http://www.umt.edu/studentaffairs/community-standards/default.php) (<http://www.umt.edu/studentaffairs/community-standards/default.php>).

**Plagiarism:**

I will not tolerate plagiarism in any form. Students need to be familiar with plagiarism and how to properly cite references and attribute the ideas of others to original sources in their work. The following is taken directly from the [UM Catalog Academic Policies and Procedures](https://montana-catalog.coursedog.com/academics/policies-procedures) (<https://montana-catalog.coursedog.com/academics/policies-procedures>):

*“Plagiarism is the representing of another's work as one's own. It is a particularly intolerable offense in the academic community and is strictly forbidden. Students who plagiarize may fail the course and may be remanded to Academic Court for possible suspension or expulsion.*

*Students must always be very careful to acknowledge any kind of borrowing that is included in their work. This means not only borrowed wording but also ideas. Acknowledgment of whatever is not one's own original work is the proper and honest use of sources. Failure to acknowledge whatever is not one's own original work is plagiarism.”*

**Equal Access:**

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors and [Office for Disability Equity](https://www.umt.edu/disability/) – ODE (<https://www.umt.edu/disability/>) (DSS). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with DSS, please contact DSS in Lommason 154 or call 406.243.2243. I will work with you and DSS to provide an appropriate modification.

**Absence Policies:**

Students are expected to attend and participate in all classes. All holidays (including non-religious cultural holidays), special events observed by organized religions, or travel needs will be honored for those students who show affiliation with that particular religion.

**Course Withdrawal and Deadlines:**

Students wishing to withdraw from this course MUST notify the instructor prior to nonattendance in class and execute appropriate drop or withdrawal procedures in accordance with the *UM Catalog Academic Policies and Procedures* (<https://catalog.umt.edu/academics/policies-procedures>). Any student failing to attend class for two or more successive meetings may be subject to automatic withdrawal if prior arrangements have not been made with the instructor. For important dates and deadlines please refer to *Spring 2022 Official Dates and Deadlines* (<http://www.umt.edu/registrar/calendar.php>) calendar.

Class Schedule			
Week	Date	Topic	Grading Points
Week 1	01/20/2022	Lab 1: Introduction to Arc: Arc Map tutorial; Arc Catalog, creating a Map; Navigating tools in ArcGIS	10
Week 2	01/27/2022	Lab 2: Database Development: creating, importing, navigating data, basic data queries <b>(Lab 1 Due)</b>	10
Week 3	02/03/2022	Lab 3: Data Capture: creating point, line, polygon feature, geocoding & projection <b>(Lab 2 Due)</b>	10
Week 4	02/10/2022	Open Lab: complete older labs <b>(Lab 3 Due)</b>  <b>*Project title &amp; theme are due today (make sure to meet the instructor at least once and discuss about your project).</b>	
Week 5	02/17/2022	Lab 4: GPS Data – create layers using GPS data	10
Week 6	02/24/2022	Lab 5: Basic Map Layout <b>(Lab 4 Due)</b>	10
Week 7	03/03/2022	Lab 6: DEM: Intro to DEMS – download, Using DEM in studies, hillshades, slope; creating streamlines and watersheds from USGIS seamless DEMs <b>(Lab 5 Due)</b>	10
Week 8	03/10/2022	Lab 7: Select Queries in ArcGIS <b>(Lab 6 Due)</b>	10
Week 9	03/17/2022	Lab 8: Open Lab: Project update <b>(Lab 7 Due)</b>	
Week 10	03/24/2022	<b>No class (Spring Break)</b>	
Week 11	03/31/2022	Lab 9: Suitability Analysis <b>(Lab 8 Due)</b>	10
Week 12	04/07/2022	Lab 10: Landuse landcover change / Model Builder <b>(Lab 9 Due)</b>	10
Week 13	04/14/2022	Lab 11: topic TBD <b>(Lab 10 Due)</b>	10
Week 14	04/21/2022	Lab 12: ArcGIS in R – Intro to using GIS data in R <b>(Lab 11 Due)</b>	
Week 15	04/28/2022	Open Lab: finish incomplete labs & work on your own project	
Week 16	05/05/2022	Open Lab: work on your own project  <b>* Project must be submitted by 8:00 pm on this day in order to be graded.</b>	

*Information contained in this syllabus, other than grade and absence policies, may be subject to change with reasonable notice, as deemed appropriate by the instructors.*