SIE 509 – PRINCIPLES OF
GEOGRAPHIC INFORMATION SYSTEMS (GIS)

INSTRUCTOR:
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348 Boardman Hall   581-2147

OFFICE HOURS: Tuesday & Thursday 3:30 – 5:00. Other times by appointment

CLASS MEETINGS: Tuesday & Thursday 9:30-10:45, 326 Boardman Hall
 On-line students can connect by Zoom: https://maine.zoom.us/j/989977542

TEXT: *GIS Fundamentals* (6th Edition) by Paul Bolstad, 2019.
ISBN 978-1-50669-587-7.

Softcover (about $40) and digital versions ($22) are available from XanEdu, from a search of their website.

Additional readings may be assigned.

SOFTWARE: You will be using QGIS, an open source GIS software that runs on Windows, Mac and Linux. QGIS can be downloaded from the website here

ONLINE COURSE MATERIALS:
  • Online students may view and participate in the live sessions via Zoom, but are not required to do so.
  • Archived Broadcasts**:** Links to the class broadcasts are made available at the end of each day through Blackboard (**https://bb.courses.maine.edu**).

COURSE OBJECTIVES:
        This is an introductory course designed to provide the student with:
  • An overview of basic principles of geographic information systems.
  • Practical experience in the use of GIS (a widely used open source GIS packages).
  • An understanding of the development of a GIS project.

TOPICS:
  • Introduction to GIS
  • Spatial Data Models
  • Map Projections and Coordinate Systems
  • Database Management
  • Data Input and Editing
  • Spatial Data Analysis

ASSIGNMENTS:
Lab Exercises
There will be 8-10 laboratory exercises, which are designed to supplement the lecture material. Unless otherwise stated, the lab report will be due one week from the date of distribution. All reports should be submitted as word docs. Any specified map layouts should be exported as a jpeg, and imported into your lab reports. Lab reports should be submitted to Blackboard by the specified due date and time.

Lab exercises have differing point values (25-50 Points), depending upon the length and difficulty of the exercise. Lab exercises will be graded on accuracy, completeness, promptness and tidiness. Exercises more than two weeks late will **NOT** be accepted unless previous arrangements have been made.

Lecture Exercises
There will be some recommended review questions at the end of most chapters as well as a few additional exercises. These may be discussed in class, but will not be graded, but will serve as the basis for exam questions.

Project:
The project should be implemented using GIS software. The project can be related to your research or be on another topic of interest.

- Sept. 26 - Project Proposal – A brief description of your project.

- Oct. 17 - Progress report– A list of **data files** needed and their **source**.

- Nov. 7 – Progress report (10 Pts) – A description of what you have accomplished to date includes your **data dictionary**.

- Dec. 12 – Presentations begin, continuing into the final exam period (40 Pts). Distance students can present via Zoom or submit a video recording of their presentation.

- Dec. 19 – Final report and completed project due by noon. (50 Pts)

EXAMS:
There are two take home exams, due:
Exam 1 - Oct. 22th
Exam 2 – Nov. 21th

GRADING:

Lab exercises	25%
Exams (2)	25% each
Project	25%

Plus and minus grading will be used.

University of Maine Policy Statements

Academic Honesty Statement: Academic honesty is very important. It is dishonest to cheat on exams, to copy term papers, to submit papers written by another person, to fake experimental results, or to copy or reword parts of books or articles into your own papers without appropriately citing the source. Students committing or aiding in any of these violations may be given failing grades for an assignment or for an entire course, at the discretion of the instructor. In addition to any academic action taken by an instructor, these violations are also subject to action under the University of Maine Student Conduct Code. The maximum possible sanction under the student conduct code is dismissal from the University.

Students with disabilities statement [f you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581.2319, as early as possible in the term. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with me (Connie Holden) privately as soon as possible.

Course Schedule Disclaimer (Disruption Clause): In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

Sexual Discrimination Reporting

The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell a teacher about an experience of **sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct or any form of gender discrimination** involving members of the campus, **your teacher is required to report** this information to the campus Office of Sexual Assault & Violence Prevention or the Office of Equal Opportunity.

> **If you want to talk in confidence** to someone about an experience of sexual discrimination, please contact these resources:
>
> For *confidential resources on campus*: **Counseling Center: 207-581-1392** or **Cutler Health Center: at 207-581-4000**.
>
> For *confidential resources off campus*: **Rape Response Services:** 1-800-310-0000 or **Partners for Peace**: 1-800-863-9909.
>
> **Other resources:** The resources listed below can offer support but may have to report the incident to others who can help:
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> For *support services on campus*: **Office of Sexual Assault & Violence Prevention: 207-581-1406, Office of Community Standards: 207-581-1409, University of Maine Police:**

Fall 2019 Class outline

	Topics	Readings
3 Sept	Course Overview	Bolstad Chap 1
5 Sept	Overview of Spatial Data Models	Bolstad Chap 2 p29-41
	Introduction to QGIS	
10 Sept	Mapping with GIS	Bolstad Chap 4 p183-189
12 Sept	Mapping with GIS	Bolstad Chap 9 p385-392
Lab 1	Mapping in QGIS	
17 Sept	Vector Models	Bolstad Chap 2 p42-53
19 Sept	Raster Models	Bolstad Chap 2 p54-59
Lab 2	Combined raster and vector mapping	
24 Sept	Data and File Structures	Bolstad Chap 2 p 69-75
26 Sept	Datums, Projections, Coordinate systems	Bolstad Chap 3 p 54-59
Lab 3	Data projection in QGIS	
1 Oct	Projections, Coordinate systems	Bolstad Chap3 p116-133
3 Oct	Attribute Management	Bolstad Chap 8 p331-349
Lab 4	Data selection and filtering	
8 Oct	Capturing Data	Bolstad Chap 4 p156-169
10 Oct	Transforming Data	Bolstad Chap 4 p170-182
Lab 5	Creating vector data in QGIS	
15 Oct	Fall Break – No Class	
17 Oct	More on Databases	Bolstad Chap 8 p350-356
22 Oct	Vector operations-changing geometry	Bolstad Chap 9 p392-395
24 Oct	Vector operations - proximity	Bolstad Chap 9 p396-402
	Exam 1	
29 Oct	Vector Operations	Bolstad Chap 9 p403-416
31 Oct	Geocoding	Bolstad Chap 9 p426-427
Lab 7	Vector Analysis	
5 Nov	Raster Analysis	Bolstad Chap 10 p443-459
7 Nov	Raster Analysis	Bolstad Chap 10 p460-468
Lab 8	Raster Analysis	
12 Nov	Raster Analysis	Bolstad Chap 10 p469-473
14 Nov	Terrain Models	Bolstad Chap 2 p63 Chap 11

Lab 9	Terrain Analysis	
19 Nov	Network Analysis	Bolstad Chap 9 p420-425
21 Nov	Digital Data	Bolstad Chap 7 p297-310
	Exam 2	
26 Nov	Digital Data	Bolstad Chap 7 p 311-326
28 Nov	Thanksgiving Break	
3 Dec	Data Quality	Bolstad Chap 14 p 617-632
5 Dec	Data Quality	Bolstad Chap 14 p 633-636
	Final Projects	
10 Dec	New Technologies and GIS	
12 Dec	Final Project Presentations	
	Final Projects	