GEOG 521: General Spatial Analysis (Face-to-face)

Geography Department
Advanced Diploma and Masters in GIS Applications

Fall Term 2023 – October 5 to December 4, 2023

Instructor: Dr. Paul Zandbergen

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To learn more about your instructor, please check my website at www.paulzandbergen.com.

Course Description

This course is an introduction to spatial analysis techniques, which will allow you to effectively make use of GIS data to help you solve real-world problems with GIS.

Course Objectives

Upon successful completion of the course material, the student should understand:

1. How to analyze tabular data
2. Techniques for creating useful information out of GIS data
3. How to effectively display spatial information
4. How to edit and manipulate vector and raster data
5. When raster or vector models are most appropriate for a particular analysis
6. Which overlay tool is appropriate to obtained desired information from geographic data
7. Complete common workflows to model spatial relationship and processes

Specific Software Skills

- Learn how to query and measure spatial attributes
- Learn how to assess spatial data, and determine appropriate uses for that data
- Understand how to convert data between vector and raster data types
- Learn how to create straight-line and cost-weighted distance surfaces

It is also expected that students will develop improved skills and perspectives for future independent study of GIS and Remote Sensing methods and applications.

Textbook

Required text: Paul Bolstad, GIS Fundamentals, 7th edition published in 2023 by Eider Press.

The book can be acquired here: https://www.gisfundamentals.org order. Shipping a paper copy from the US may take some time, so you are encouraged to get access to a digital copy through Redshelf or VitalSource for US $24.

Course Delivery

Dates:	October 5 – December 4, 2023
Lectures:	9:00 am to 10:00 am and 1:00 pm to 2:00 pm
Lab:	10:15 am to 12:00 pm and 2:15 to 4:00 daily
Location	Nanaimo Campus, Building 180, Room 236

Each day has two lectures and one lab. There is a 1-hour lecture in the morning and after lunch. Labs are presented after the first lecture, and you have the remainder of the day to complete them. Lab assignments are submitted and graded in VIU Learn.

Modules from ESRI Training will be assigned to get practice with the ArcGIS Pro software. Proof of completion of these modules is to be submitted together with the lab assignments.

A final exam and a lab exam will take place at the end of the course and will cover all the material discussed in the course.

Course Schedule

The course schedule outlines the activities that will take place in the course, but please bear in mind that specific details are subject to change with reasonable notice. I will communicate changes via announcements in class and on the course website.

Date	Lectures	Assignments	Due date/time
9/28/23	Course introduction	Esri Training module	10/5/2023 4:00 PM
	Raster analysis	Lab 1 Raster Analysis	10/5/2023 4:00 PM
10/5/23	Suitability modeling	Esri Training module	10/12/2023 4:00 PM
		Lab 2 Suitability Modeling	10/12/2023 4:00 PM
10/12/23	Least-cost path	Esri Training module	10/19/2023 4:00 PM
	Corridor analysis	Lab 3 Least-cost Path Analysis	10/19/2023 4:00 PM
10/19/23	Terrain models	Esri Training module	10/26/2023 4:00 PM
		Lab 4: TINs and DEMs	10/26/2023 4:00 PM
10/26/23	Watershed analysis	Esri Training module	11/2/2023 4:00 PM
		Lab 5 Watershed Analysis	11/2/2023 4:00 PM
11/2/23	Visibility analysis	Esri Training module	11/9/2023 4:00 PM
	3D analysis	Lab 6 Visibility Analysis	11/9/2023 4:00 PM
11/9/23	Vector analysis	Esri Training module	11/23/2023 4:00 PM
		Lab 7 Vector Analysis	11/23/2023 4:00 PM
11/16/23	Break		
11/23/23	GPS	Esri Training module	11/30/2023 4:00 PM
		Lab 8 GPS	11/30/2023 4:00 PM
11/30/23	Review		
12/4/23	Final Exam 9:30-11:30 am		12/4/2023 11:30 AM
	Lab Exam 1:00-4:00 pm		12/4/2023 4:00 PM

Assignments

Students are expected to complete the following assignments:

- Lab submissions (8 total, 7% each) 56%
- Esri Training Certificates (8 total, 1% each) 8%
- Lab Exam 16%
- Final Exam 20%

Grading Scale

Grade	Percentage	Comments
A+ A A-	90-100 85-89 80-84	Outstanding performance and exceptional work. Demonstrates sound critical thinking skills, innovative ideas and shows depth and breadth of understanding. Content, organization and style demonstrate ability to synthesize and apply course material. Detailed reference to existing literature is demonstrated.
B+ B B-	76-79 72-75 68-71	Strong performance and work. Demonstrates the use of critical thinking skills and clear understanding of course material. Clear reference to existing literature is demonstrated.
C+	64-67	Satisfactory performance and adequate work. Content, organization and style demonstrate basic understanding of course material. Adequate use of existing literature is demonstrated.
C C-	60-63 55-59	Marginal performance and work. Content, organization and style demonstrate poor comprehension of course material. Poor use of existing literature.
D	50-54	Marginal performance and work.
F	0-49	Did not successfully complete course requirements.
W		A grade which can be issued only by Registration when a student officially withdraws from a course. This can only be done during the first five weeks of class (students' responsibility to check calendar for deadline). Instructors cannot issue "W" grades.

Important Notes

This syllabus is the definitive description of course policy and supersedes all other course descriptions.

Students are expected to work in a professional manner. This involves respect of the facilities, colleagues, ADGISA/MGISA staff, and the educational process.

The ADGISA/MGISA staff does not wish to set up an environment that restricts the student's ability to work on the computers. Software that restricts access to the system can slow down operations and cause other problems for lab users. We prefer to simply log operations on the computers, rather than restrict access. However, the changing of any computer settings, defaults, or other components of the hardware, operating system, or application software without the express direction of either the course instructor or the GIS lab technician will not be tolerated. The distribution of pirated software or media is illegal and the use of VIU's facilities for the distribution of such will not be tolerated.

Performing analysis on your own computers is both a privilege and a responsibility. In return for the flexibility of being able to work on their own laptops, students are solely responsible for the maintenance and upkeep of their machines. This includes regular maintenance tasks, such as cleaning up hard drives, defragmenting hard drives, installing and using an appropriate firewall, and performing backups. In particular, students are expected to make backup copies of their work on a daily basis.

In this program, you receive large amounts of instructional time, unprecedented access to state-of-the-art software and equipment, a great deal of access to your instructors, and the opportunity to work with

some other fantastic students. If you use these resources effectively, you can learn an amazing amount in eight months. In this program, however, as in the real world, you are graded on your results, not on your efforts, so it is important to be efficient at producing quality work.

Handling of Student Work

- Students are responsible for retaining a copy of all submitted work.
- All assignments to be submitted to the instructor during class time or during instructor office hours.
- Every effort will be made to return assignments to students within two weeks.
- Students can make an appointment with their instructor to review and discuss their exams, assignments or course grade.
- Unclaimed assignments will be kept for one month after the grade submission deadline
- Final grades will be posted in a secure location on the Internet.

Student Support

Academic Calendar
Writing Centre
Student Affairs
Disability Services

Attendance

Attendance and participation in classes is mandatory. Students are required to contact the instructor in advance if they are unable to attend classes. Absences of more than 3 classes may result in the student being removed from the course.

Late Policy

Deadlines for all assignments are clearly indicated in the course website. Lab assignments are typically due on **Thursday at 4:00 PM** one week after the lab is assigned. The penalty for late submission of these assignments is 10% per day or part thereof. So if an assignment is due on Thursday at 4:00 PM this means that a submission posted on Thursday at 4:01 PM results in a 10% late penalty. Assignments posted more than 7 days late will not be accepted.

If, due to illness or emergency you cannot submit your assignment on time, please discuss this with the instructor prior to the due date and an individual revised due date may be established. Doctor's notes are required for medical absences.

Academic Misconduct

Violations of academic integrity, including dishonesty in assignments, examinations, or other academic performances, are prohibited and will be handled in accordance with the Student Academic Code of Conduct Procedures. If you have any concerns about possible plagiarism or other academic misconduct, please contact your instructor before handing in the assignment in question.

Academic misconduct includes, but is not limited to, the following acts:

Cheating: Cheating is an act of deception by which students misrepresent that they or others have mastered information for an academic exercise.

Fabrication: Fabrication is the intentional use of false information or the falsification of research or other findings with the intent to deceive.

Plagiarism: Plagiarism is the intentional unacknowledged use of someone else's words, ideas, or data. When a student submits work for credit that includes the words, ideas or data of others, the source of that information must be acknowledged through complete, accurate, and specific references, in a style appropriate to the area of study, and, if verbatim statements are included, through quotation marks or block format as well. By placing their names on work submitted for credit, students certify the originality of all work not otherwise identified by appropriate acknowledgments.

Facilitation of Academic Misconduct: Helping or attempting to help another to commit act(s) of academic misconduct as outlined above.

Non-attendance

Non-attendance, where attendance is deemed to be mandatory, is not acceptable. Absences due to personal illness, family illness, death of an immediate family member, religious ceremonies, or sports events in which the student represents Vancouver Island University are allowed and must be approved by the appropriate instructor or coordinator. Non-attendance must be for valid reasons and not falsified. Some departments have specific attendance requirements, and details may be obtained from the instructor, department chair, or program coordinator.

Disciplinary Action

Every reasonable effort should be made to deal with student conduct concerns at the instructional and departmental level. Formal discipline is designed for serious intentional academic misconduct.

Acts of academic misconduct may make a student subject to a range of disciplinary action – including failure for a course assignment or a course, or possible suspension by the President.

No student shall be allowed to withdraw from a course, or the University-College, to avoid receiving a failing grade based upon academic misconduct. A withdrawal under such circumstances shall result in an "F" grade being recorded on the student's transcript for the course(s) in question.

Please refer to the Student Academic Code of Conduct Procedures and the Student Conduct Code policy for information on handling breaches of this policy.

End