



COURSE OUTLINE

GEOG391: 3D Printing for Spatial Analysis

In grateful acknowledgement of the L'kwungen & WSÁNEĆ Peoples upon whose territories we are able to live and learn.

Course materials and instructions will be made available on Brightspace (bright.uvic.ca). Please read this outline and further instructions carefully.

Instructor: Drs. Ian O'Connell and Sophie Norris

Office Hours: Week 2 drop-in schedule will be shared in your first class

Contact: ianoc@uvic.ca and sophienorris@uvic.ca

Lectures: DTB-A249

You can find all assignments and supporting material on Brightspace. All lab material will be provided.

A \$25 CAD course fee is required to take this course. Payment can be made in cash at the Geography Main Office (DTB-B203). Payment must follow registration and be made by 3 pm the Friday before the class starts. This course fee helps the Geography Department recoup costs associated with printing (filament, nozzles, etc.). If payment presents a financial barrier to you, please contact the course instructor as soon as possible.

COURSE DESCRIPTION

This course will explore how spatial data can be transformed into tangible 3D models that enhance interpretation and decision-making. The course covers essential GIS concepts, spatial analysis techniques, and workflows for converting digital geospatial data into printable formats. Hands-on projects guide students through creating, editing, and printing 3D terrain, urban forms, and thematic spatial models. By the end of the course, students will understand how physical models can support communication, planning, and problem-solving in a variety of geospatial fields

COURSE OBJECTIVES

- Explore the integration of GIS with 3D modelling and printing
- Develop practical skills in digital mapping, geoprocessing, and 3D fabrication
- Apply GIS and 3D printing to real-world projects

LEARNING OUTCOMES

- Perform spatial data acquisition and analysis using GIS software
- Create and manipulate 3D models from GIS data
- Understand coordinate systems and projections for accurate 3D outputs
- Produce physical 3D printed models from geospatial datasets
- Present a final project integrating GIS analysis and 3D printing

RECOMMENDED TEXT

Oswald, C. J., Rinner, C., & Robinson, A. (2019). Applications of 3D printing in physical geography education and urban visualization. *Cartographica: The International Journal for Geographic Information and Geovisualization*, 54(4), 278–287. <https://doi.org/10.3138/cart.54.4.2018-0007>

A variety of additional research articles and book chapters will be assigned throughout the terms associated with specific lectures.

EVALUATION

The course grade will be based on the following:

		Date (or date due)	Weight	Subject
1	Labs and in class assignments	Listed below	x3 (25% total)	Lecture, text and labs topics
2	Online Quizzes	Listed below	x3 (5% each)	Lecture, text and labs topics
3	Proposal presentation	Listed below	10%	Lecture, text and labs topics
4	Final Project	Listed below	50%	Lecture, text and labs topics

GRADING SYSTEM

As per the Academic Calendar:

Grade	Grade point value	Grade scale	Description
A+ A A-	9 8 7	90-100% 85-89% 80-84%	Exceptional, outstanding and excellent performance. Normally achieved by a minority of students. These grades indicate a student who is self-initiating, exceeds expectation and has an insightful grasp of the subject matter.
B+ B B-	6 5 4	77-79% 73-76% 70-72%	Very good, good and solid performance. Normally achieved by the largest number of students. These grades indicate a good grasp of the subject matter or excellent grasp in one area balanced with satisfactory grasp in the other area.
C+ C	3 2	65-69% 60-64%	Satisfactory, or minimally satisfactory. These grades indicate a satisfactory performance and knowledge of the subject matter.
D	1	50-59%	Marginal Performance. A student receiving this grade demonstrated a superficial grasp of the subject matter.
F	0	0-49%	Unsatisfactory performance. Wrote final examination and completed course requirements; no supplemental.
N	0	0-49%	Did not write examination or complete course requirements by the end of term or session; no supplemental.

GEOGRAPHY DEPARTMENT INFO

Geography Department website: <http://geog.uvic.ca>

Undergraduate Advisor: geogadvising@uvic.ca

Department Chair: geogchair@uvic.ca

POLICY ON LATE ASSIGNMENTS

Extension on assignments will not be offered in this course. If you are unable to complete your assignment by the due date, you will receive 0% for this assignment. If an assignment is missed due to an extenuating circumstance, attend your instructor’s (Drs. Ian O’Connell or Sophie Norris) next available office hours to discuss the possibility of a make-up assignment. A new makeup assignment will be issued in extenuating circumstances only and with appropriate documentation as necessary.

POLICY ON ATTENDANCE

WEEKLY CALENDAR (tentative schedule- subject to change)

WEEK 1							WEEK 2
	Monday	Tuesday	Wednesday	Thursday	Friday	Monday-Friday	
9:00 am-12:00 pm AM Session (3 hours)	Course overview and expectations	GIS and 3D models production	Practical Session: Blender, Complete cityscape modeling + STL export + print*	Final project information	3D scanning and digital data manipulation	Final project work (print room open to students with drop-in support hours provided daily)	
	Intro to GIS & 3D Printing			3D printing fabrication and production			
Lunch Break (12:00-1:00 pm)							
1:00 pm- 4:00 pm PM Session (3 hours)	Practical Session: Spatial Data Basics Safety+ Overview + printer setup + test print	Practical Session: Creating 3D terrain models	Practical Session: Blender, Complete cityscape modeling + STL export + print	Group Project work period	Final project proposal presentation	Final project work (print room open to students)	
Assignments	<i>Online Quiz 1 due @ 11.59pm</i> <i>Lab assignment due at 4:00 pm</i>	<i>Online Quiz 2 due @ 11.59pm</i> <i>Lab assignment due at 4:00 pm</i>	<i>Lab assignment due at 4:00 pm</i>		<i>Online Quiz 3 due @ 11.59pm</i>	<i>Final project due on Friday at 4:00 pm of second week</i>	

Note: Some 3D prints may require extended time beyond scheduled lab hours. Students will set up prints during class and monitor completion as needed.

DISCLAIMER

The above schedule, policies, procedures, and assignments in this course are subject to change in the event of extenuating circumstances.

ACADEMIC INTEGRITY

It is every student’s responsibility to be aware of the university’s policies on academic integrity, including policies on **cheating, plagiarism, unauthorized use of an editor, multiple submissions, and aiding others to cheat.**

Please be advised that in this course you are not authorized to use any form of generative AI. In order to successfully complete course activities, generative AI is not required nor welcomed. Students should not make any use of generative AI tools such as ChatGPT, Grammarly, among others that use AI for content generation and editing. As the University of Victoria states on its Academic Integrity Policy “Academic integrity requires commitment to the values of honesty, trust, fairness, respect, and responsibility.” Therefore, it is expected that you comply with the course syllabus, and I encourage you to enhance your academic experience in this course by refraining from using generative AI.

Policy on Academic Integrity: <https://www.uvic.ca/calendar/archives/202205/undergrad/index.php#/policies>. If you have any questions, talk to me, your course instructor. For more information, see uvic.ca/learningandteaching/cac/index.php.

ACCESSIBILITY

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a documented disability or health consideration that may require accommodations, please feel free to approach me and/or the Centre for Accessible Learning (CAL as soon as possible <https://www.uvic.ca/services/cal/>). The RCSD staff is available by appointment to assess specific needs, provide referrals, and arrange appropriate accommodations. The sooner you let us know your needs, the quicker we can assist you in achieving your learning goals in this course.

POSITIVITY AND SAFETY

The University of Victoria is committed to promoting, providing and protecting a positive and safe learning and working environment for all its members.

SEXUALIZED VIOLENCE PREVENTION AND RESPONSE AT UVIC

UVic takes sexualized violence seriously, and has raised the bar for what is considered acceptable behaviour. We encourage students to learn more about how the university defines sexualized violence and its overall approach by visiting uvic.ca/svp. If you or someone you know has been impacted by sexualized violence and needs information, advice, and/or support please contact the sexualized violence resource office in Equity and Human Rights (EQHR). Whether or not you have been directly impacted, if you want to take part in the important prevention work taking place on campus, you can also reach out:

Where: Sexualized violence resource office in EQHR; Sedgewick C119

Phone: 250.721.8021

Email: svpcoordinator@uvic.ca

Web: uvic.ca/svp

COURSE EXPERIENCE SURVEY (CES)

I value your feedback on this course. Towards the end of term, as in all other courses at UVic, you will have the opportunity to complete an anonymous survey regarding your learning experience (CES). The survey is vital to providing feedback to me regarding the course and my teaching, as well as to help the department improve the overall program for students in the future. The survey is accessed via MyPage and can be done on your laptop, tablet, or mobile device. I will remind you and provide you with more detailed information nearer the time but please be thinking about this important activity during the course.

NOTE:

A note to remind you to take care of yourself. Do your best to maintain a healthy lifestyle this semester by eating well, exercising, getting enough sleep and taking some time to relax. This will help you achieve your goals and cope with stress. All of us benefit from support during times of struggle. You are not alone.

Counselling Services - *Counselling Services can help you make the most of your university experience. They offer free professional, confidential, inclusive support to currently registered UVic students.* uvic.ca/services/counselling/

Health Services - *University Health Services (UHS) provides a full service primary health clinic for students, and coordinates healthy student and campus initiatives.* uvic.ca/services/health/

Centre for Accessible Learning - *The CAL staff are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations uvic.ca/services/cal/. The sooner you let us know your needs the quicker we can assist you in achieving your learning goals in this course.*

Elders' Voices - *The Office of Indigenous Academic and Community Engagement (IACE) has the privilege of assembling a group of Elders from local communities to guide students, staff, faculty and administration in Indigenous ways of knowing and being. uvic.ca/services/indigenous/students/programming/elders/index.php*