



**FLORIDA INTERNATIONAL UNIVERSITY
UNIVERSITY CURRICULUM COMMITTEE**

Proposal for a New Course

DO NOT TYPE IN THIS BOX

Bulletin # : _____

Academic Year : _____

1. School/College International & Public Affairs
 Div./Dept. in Which Taught Global and Sociocultural Studies

2. GIS 5 CIP Code (Leave this blank): _____
 Alpha Prefix 1st Digit Last 3 Digits "C"-lec-lab "L"-Lab Cr. Hrs.

3. Grading Method (select one): Graded Pass/Fail

4a. Course Title Critical GIScience

b. Abbreviated course Title (for computer class schedules, transcripts) Critical GIScience
LIMITED TO 25 Characters (including spaces)

5. Statewide Course Numbering Subject Matter Area Seminar

6. Catalog Description/Major Topics (not to exceed 200 characters including spaces)
College of Medicine and College of Law: Attach description not exceeding 1,000 characters including spaces.

This seminar examines the science of GIS and new geospatial technologies. It focuses on the social implications of and social biases inherent in technologies, science, and their deployments.

7. Attach detailed syllabus course outline and course justification on separate page(s).

8. Prerequisite(s): N/A

9. Corequisite(s): N/A

10. Objective(s) of Course:

Learn the theoretical foundations of critial GIScience; Discuss social critiques of GIS; Learn alternate approaches within the field.

11. Does this course duplicate/overlap other courses at FIU? No Yes
 If yes, please explain: _____

12. What other closely related department(s) have been consulted about this course?
N/A

13. Is this course used for the assessment of a program or a certificate (if yes, then send a notification to assessment@fiu.edu)? No Yes

PROPOSAL REQUESTED BY:

Faculty Contact	- Dr. Genevieve Reid		03 / 09 / 2021
	(Type name)	(Signature)	
	greid@fiu.edu		
	(Email address)	(Phone number)	
Chairperson (Dept./Div.)	Guillermo J. Grenier		03 / 10 / 2021
	(Type name)	(Signature)	
Chairperson (Curr. Comm.)	_____	_____	/ / 20__
	(Type name)	(Signature)	
College/School Dean	_____	_____	/ / 20__
	(Type name)	(Signature)	

Submit one original form. Attach one copy of the course justification and course syllabus, course description, objectives, major topics and textbooks.

FLORIDA INTERNATIONAL UNIVERSITY UNIVERSITY CURRICULUM COMMITTEE

Course Justification

Proposal for a New Course: Critical GIScience

Department of Global and Sociocultural Studies

Dr. Genevieve Reid

March 2021

Critical GIScience includes a range of geographic information systems (GIS) research that focuses on the social implications of and social biases inherent in the science, technology, and their deployments, rather than merely considering GIS as a neutral technical tool. The field of critical GIS originated in the beginning of the 90s and evolved with growing range of themes, researchers, and advocates. With technological advancements such as Web 2.0 and big data, the discipline of Geography is transformed. A new critical GIScience encompasses many aspects of change to GIS and mapping, including volunteered geographic information, crowd mapping, location-based services and associated issues of loss of locational privacy. The proposed critical GIScience course will prepare students with a deep understanding of social, cultural, political and ethical implications associated with both GIS and new geospatial technologies.

Currently, our curricula does not include such a course to teach critical aspects of GIS and geospatial technologies to our graduate students. The proposed new course will teach students how to critically assess the design, use, and deployments of geospatial technologies in society.

The critical GIScience course complements but does not overlap with the knowledge that students gain in other GIS courses in the department of Global and Sociocultural studies or in other departments at FIU.

GENERAL INFORMATION

PROFESSOR INFORMATION

Instructor: Prof. Genevieve Reid
Phone: (305) 348-0352
Office: SIPA, room 314
Office Hours: By Appointment (zoom meeting or in my office)
E-mail: greid@fiu.edu

Course Time Zone | Eastern Standard Time (EST). Course due dates are according to this time zone.

COURSE DESCRIPTION AND PURPOSE

Critical GIScience includes a range of geographic information systems (GIS) and new geospatial technologies research that focuses on the social implications of and social biases inherent in the science, technology, and their deployments. This course is designed as a seminar to discuss the theoretical and practical questions arising from the socially-constructed nature of geographical information and GIS, and from their social impacts.

Geospatial technologies are widely used in a range of disciplines, and in public and private sector. It is an ever growing multibillion dollar global business. To be proficient in GIS and new geospatial technologies, one not only needs to understand the technology, but also the science behind the technology. This seminar explores the interconnected relationship between the society and GIS/new geospatial technologies, and explores the implications and impacts of such a relationship. With the recent evolution of geospatial technologies (geoweb, big data, web mapping tools, volunteered geographic information, etc.) critical GIScience includes the study of many aspects of changes since early GIS technologies and explore their impacts in society such as the issue of potential loss of privacy.

The course is designed as a seminar, with weekly readings, presentations, and a final literature review paper on a topic chosen by the student. The course covers topics such as the history and evolution of critical GIScience, participatory approaches to GIS, feminist GIScience, and Indigenous GIScience.

COURSE OBJECTIVES

The objective of this course is to present the theoretical foundations of the field of the critical GIScience. The course focuses on GIS and geospatial technologies, the social-theoretical critiques on these, and alternate approaches within the field. Students will develop their capability of critically assessing geospatial technologies and their use.

Upon completing this course, students will be able to:

- To list and explain the theoretical foundations of the field of GIScience
- To discuss the social critiques of GIS and geospatial technologies uses
- To characterize the role and place of geospatial information within social fabrics
- To explain the multiple ways in which space and society can be represented within GIScience
- To critically assess GIScience studies

IMPORTANT INFORMATION

COURSE PREREQUISITES

There are no prerequisites for this course.

TEXTBOOK

There is no textbook for the course. Readings will be assigned each week. Copies of book chapters and academic journal articles will be uploaded on Canvas.

EXPECTATIONS OF THIS COURSE

This is an upper level seminar class intended for Graduate students or College Seniors. If you are a Freshman or Sophomore you may find this class too difficult. There will be a high reading load, for which you should be prepared. Students are expected to have read assigned readings *before* joining class.

This class is designed as a graduate seminar experience. In the first few weeks, I will give lectures introducing students to the study of *critical GIScience*. As the course progresses, students will increasingly take charge by giving short presentations on the day's readings at the beginning of class and leading discussions. Every student is also expected to participate in the class discussions. This means that you need to be well prepared when joining class.

COURSE DETAIL

ASSIGNMENTS

Attendance and Participation (20% of final grade)

Attendance in class is necessary to achieve a passing grade. Students are responsible for all information, materials, and instructions disseminated during the class period. If you miss a class, make sure you get notes from classmates. Better still, discuss the missed material with your classmates.

To monitor attendance and participation, I award points in the following ways: 1) your presence in class; 2) through the quality and quantity of your volunteered contributions in class about the readings; 3) through the quality of your contribution in class when you are directly asked questions about the readings.

Presentation (25% of final grade; between week 5 and week 13)

At the beginning of the course, each student will choose a week to present. In their presentation, the student will cover the summary of the readings as well as the general topic for that week. Each student is expected to do additional readings about the topic.

Two days prior to the presentation, students are required to provide the presentation material to their discussant.

Additional instructions will be provided.

Discussant (25% of final grade; between week 5 and week 13)

At the beginning of the course, each student will choose another week to be the discussant and monitor the discussion at the end of another student's presentation. The discussant will receive the presentation material two days prior to the class. The discussant is expected to prepare discussion points and questions based for the class. Students will be graded on relevance of discussion points and quality of monitoring the conversation.

Students will select their discussant topic between week 5 and week 13 of the course.

Additional instructions will be provided.

Final Paper (30% of final grade; due before last class on week 15)

Each one of you will write a final paper of around 2,000 words. The final paper is a literature review on your presentation topic.

Additional instructions will be provided.

GRADING

Late Assignment Submission Policy

You will lose 1 point for every day the final paper is late.

Letter	Range (%)	Letter	Range (%)	Letter	Range (%)
A	95 or above	B	83 - 86	C	70 - 76
A-	90 - 94	B-	80 - 82	D	60 - 69
B+	87 - 89	C+	77 - 79	F	59 or less

COURSE OUTLINE

	Lecture	Topics	Readings
Week 1	Introduction to Critical GIScience	supremacy, control, power, military, gender, technocracy, positivism, dynamics of power in society, silencing, surveillance, privacy, data protection, data sovereignty, Platform economy, capitalism, democracy, digital divide, construction of geospatial technologies, ontology	No reading for this week
Week 2	Origins of critical GIS	Power of maps, Friday Harbor, qualitative turn, science wars, GIS wars	Curry, 1995; Lake, 1993; Sheppard, 1995
Week 3	Technocratic nature of GIS	History of technocracy, construction of GIS	Obermeyer, 1995; Reid and Sieber, 2020a
Week 4	Evolution of critical GIScience	Evolutions of debates and major themes in critical GIScience	Schuurman, 2000; Thatcher et al, 2016
Week 5	Dissecting components of new geospatial technologies 1	Geoweb versus GIS, new tools, new visualizations, new practices, privacy issues, surveillance	Elwood and Leszczynski, 2011
Week 6	Dissecting components of new geospatial technologies 2	VGI, Neogeography, crowdsourcing, democracy	Sieber and Haklay, 2015; Warf and Sui, 2010
Week 7	Dissecting components of new geospatial technologies 3	Big Data, Open data	Chen and Quan-Haase, 2020
Week 8	PPGIS	Participation, ladder of participation, challenges of PPGIS, digital divide	Elwood, 2006; Sieber et al. 2016
Week 9	Crisis Mapping, disease mapping, epidemiology	Temporal data, emergency mapping, digital activism,	Brandusescu and Sieber, 2018; Haworth, 2018
Week 10	Artificial Intelligence, Smart Cities	Benefits and challenges of new technologies in urban planning applications	Roche, 2016; Tenney et al, 2020
Week 11	Feminist GIScience	Feminist Theory; Data feminism; alternate representations, too much data/not enough data, gender and the geoweb; feminist digital geography	Elwood and Leszczynski, 2018; Kwan, 2002; Stephens 2013
Week 12	Qualitative GIS	Qualitative versus quantitative, visualisations practices	Taylor et al, 2020; Wilson, 2009
Week 13	Emotional mapping	Affect, care, flaneur	Kwan, 2007
Week 14	Indigenous GIScience	Epistemologies, ontologies, Indigenous Knowledges, Sharing/protecting, data sovereignty, too much data/not enough data, counter data, countermapping; to map or be mapped	Reid and Sieber, 2020b; Rundstrom, 1995
Week 15	Wrap up FINAL PAPER DUE	What have we learned? Future of critical GIScience?	Pavlovskaya, 2018; Wilson, 2017

REQUIRED READINGS

- Brandusescu, A., & Sieber, R. E. (2018). The spatial knowledge politics of crisis mapping for community development. *GeoJournal*, 83(3), 509–524.
- Chen, W., & Quan-Haase, A. (2020). Big Data Ethics and Politics: Toward New Understandings. *Social Science Computer Review*, 38(1), 3–9. <https://doi.org/10.1177/0894439318810734>
- Curry, M. R. (1995). Geographic information systems and the inevitability of ethical inconsistency. In J. Pickles (Ed.), *Ground Truth. The Social Implications of Geographic Information Systems* (pp. 68–87). Guilford Press.
- Elwood, S. (2006). Critical Issues in Participatory GIS: Deconstructions, Reconstructions, and New Research Directions. *Transactions in GIS*, 10(5), 693–708.
- Elwood, S., & Leszczynski, A. (2011). Privacy, reconsidered: New representations, data practices, and the geoweb. *Geoforum*, 42(1), 6–15. <https://doi.org/10.1016/j.geoforum.2010.08.003>
- Elwood, S., & Leszczynski, A. (2018). Feminist digital geographies. *Gender, Place & Culture*, 25(5), 629–644. <https://doi.org/10.1080/0966369X.2018.1465396>
- Haworth, B. T. (2018). Implications of Volunteered Geographic Information for Disaster Management and GIScience: A More Complex World of Volunteered Geography. *Annals of the American Association of Geographers*, 108(1), 226–240. <https://doi.org/10.1080/24694452.2017.1321979>
- Kwan, M.-P. (2002). Is GIS for women? Reflections on the critical discourse in the 1990s. *Gender, Place and Culture: A Journal of Feminist Geography*, 9(3), 271–279.
- Kwan, M.-P. (2007). Affecting Geospatial Technologies: Toward a Feminist Politics of Emotion. *The Professional Geographer*, 59(1), 22–34.
- Obermeyer, N. J. (1995). The hidden GIS technocracy. *Cartography and Geographic Information Systems*, 22(1), 78–83.
- Pavlovskaya, M. (2018). Critical GIS as a tool for social transformation. *The Canadian Geographer / Le Géographe Canadien*, 62(1), 40–54. <https://doi.org/10.1111/cag.12438>
- Reid, G., & Sieber, R. E. (2020a). Unavoidable expertise, ‘technocratic positionality,’ and GIScience: Eliciting an indigenous geospatial ontology with the Eastern Cree in Northern Quebec. *Gender, Place & Culture*, 1–23. <https://doi.org/10.1080/0966369X.2020.1811209>
- Reid, G., & Sieber, R. E. (2020b). Learning from critiques of GIS for assessing the geoweb and indigenous knowledges. *GeoJournal*. <https://doi.org/10.1007/s10708-020-10285-2>
- Roche, S. (2016). Geographic information science II: Less space, more places in smart cities. *Progress in Human Geography*, 40(4), 565–573. <https://doi.org/10.1177/0309132515586296>
- Rundstrom, R. A. (1995). GIS, Indigenous Peoples, and Epistemological Diversity. *Cartography and Geographic Information Science*, 22(1), 45–57. <https://doi.org/10.1559/152304095782540564>
- Schuurman, N. (2000). Trouble in the heartland: GIS and its critics in the 1990s. *Progress in Human Geography*, 24(4), 569–590. <https://doi.org/10.1191/030913200100189111>
- Sheppard, E. (1995). GIS and society: Towards a research agenda. *Cartography and Geographic Information Systems*, 22(1), 5–16.
- Sieber, R. E., & Haklay, M. (2015). The epistemology(s) of volunteered geographic information: A critique. *Geo: Geography and Environment*, 2(2), 122–136. <https://doi.org/10.1002/geo2.10>
- Sieber, R. E., Robinson, P. J., Johnson, P. A., & Corbett, J. M. (2016). Doing Public Participation on the Geospatial Web. *Annals of the American Association of Geographers*, 106(5), 1030–1046. <https://doi.org/10.1080/24694452.2016.1191325>
- Stephens, M. (2013). Gender and the GeoWeb: Divisions in the production of user-generated cartographic information. *GeoJournal*, 78(6), 981–996. <https://doi.org/10.1007/s10708-013-9492-z>
- Tenney, M., Garnett, R., & Wylie, B. (2020). A theatre of machines: Automata circuses and digital bread in the smart city of Toronto. *The Canadian Geographer*, 64(3), 388–401. <https://doi.org/10.1111/cag.12636>

- Thatcher, J., Bergmann, L., Ricker, B., Rose-Redwood, R., O'Sullivan, D., Barnes, T. J., Barnesmoore, L. R., Imaoka, L. B., Burns, R., Cinnamon, J., Dalton, C. M., Davis, C., Dunn, S., Harvey, F., Jung, J.-K., Kersten, E., Knigge, L., Lally, N., Lin, W., ... Young, J. C. (2016). Revisiting critical GIS. *Environment and Planning A*, 48(5), 815–824. <https://doi.org/10.1177/0308518X15622208>
- Warf, B., & Sui, D. (2010). From GIS to neogeography: Ontological implications and theories of truth. *Annals of GIS*, 16(4), 197–209. <https://doi.org/10.1080/19475683.2010.539985>
- Wilson, M. W. (2009). Towards A Genealogy of Qualitative GIS. In M. Cope & S. Elwood, *Qualitative GIS* (pp. 156–170). SAGE Publications Ltd. <https://doi.org/10.4135/9780857024541.n9>
- Wilson, M. W. (2017). Chapter 1: Criticality: The Urgency of Drawing and Tracing. In *New Lines: Critical GIS and the Trouble of the Map* (pp. 25–46). University of Minnesota Press. <https://doi.org/10.5749/j.ctt1pwt6q4>