

GEOGRAPHY AND PLANNING

GPHY 243 – Geographic Information Science



Course Instructor	Dr. Paul Belanger	Email: paul.belanger@queensu.ca	
Office	TBD		
Contact Time	Two hours lecture per week and two hours practicum per week		
Format	Lectures and practicums		
Class Assessment	Lab assignments	60%	Duration of course
	Mid-term examination	40%	Weeks 6 and 11

COURSE OVERVIEW

Contemporary Geographic Information Systems (GIS) and Geographic Information Science (GIScience) are used in diverse disciplines including planning, emergency response, public health, transportation, and across fields of study ranging from political science to anthropology to oceanography. Common to these areas of inquiry is the centrality of space, the location of objects, and the need to both display and analyze the spatial relationships between them. This course provides an introduction to digital mapping and spatial analysis using GIS as a technology and a simultaneous introduction to the underlying GIScience concepts. Students will learn to create their own maps and how to leverage GIS to analyze a suite of geographic problems and questions. Lectures will largely focus on underlying GIScience concepts and theory, while the lab practicums will afford students hands-on experience to address practical geographic problems using industry-standard GIS software.

LEARNING OUTCOMES

- To offer students a rigorous introduction to both geographic information science and geographic information systems technology.
- To provide students with hands-on experience working with a geographic information system, working with spatial data, producing thematic maps, and using spatial query and analysis techniques to answer typical business and/or research questions.
- To provide a conceptual and practical foundation for the further study of GIS in academia or industry.

COURSE TOPICS

Motivation for GISystems and GIScience; georeferencing (datums, projections, and coordinate systems); spatial scale; data quality and metadata; spatial data models; review of cartographic principles; spatial queries; primitive spatial algorithms; terrain analysis, raster algebra; web mapping, spatially-enabled relational databases; emerging trends in GIScience

COURSE READINGS

Course Text

Longley, Paul A. et al. (2015) *Geographic Information Science and Systems, 4th Edition*. Hoboken, NJ: Wiley.

Reference Texts and Readings

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

DiBiase, David et al. (2006) *Geographic Information Science and Technology Body of Knowledge, 1st Edition*. Washington, DC: AAG, [http://www.aag.org/galleries/publications-files/GIST Body of Knowledge.pdf](http://www.aag.org/galleries/publications-files/GIST_Body_of_Knowledge.pdf)