Introduction to Geographic Information Systems

IGME 384
Spring 2022

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Virtual Office Hours: By appointment use https://calendly.com/jdcgla/office-hours to sign up
Class Modality: Tuesday and Thursday 11:00 AM - 12:15 PM (ORN)-1370

Course Description
This course introduces students to Geographic Information Systems (GIS) for understanding and representing people, places, and cultures. Through applied research projects, students will learn how GIS is a support mechanism for spatially-oriented thinking, reasoning, literacy, and problem-solving at a global scale. Such global problems include international disaster management, digital humanities, climate change, and sustainable development. Course lectures, writing and reading assignments, and in-class activities cover a mix of conceptual, practical, and technical GIS topics. Topics include interactions among people, places, and cultures around the world, GIS data models, basic cartography, geodatabases, spatial data acquisition and creation, and spatial analysis. This general education course also examines GIS ethical issues such as privacy, information ownership, accuracy, and mapping, and social power.

Goals of the Course
After successfully completing this course, students will be able to:

- Engage in learning about global relationships between people and cultures using a geographic perspective
- Explain and apply theoretical and computational concepts related to GIS (e.g. spatial databases, map production and cartography, basic GIS programming)
- Address global problems using spatially-oriented thinking, reasoning, literacy, and problem-solving (e.g. disaster management, climate change, sustainable development)
- Explore problem-solving with GIS and incorporate ethical issues such as privacy, information ownership, accuracy, and mapping, and social power
- Think critically about global, regional, and local sustainable development issues
- Identify the U.N. Sustainable Development Goals

Course Prerequisites
None

Course Format
Every week will include a combination of lectures, class discussions posts, and labs. Students should read/watch any assigned articles or videos before each week. The classes are designed to deepen and broaden your understanding of the information and concepts that have been covered in assigned readings, videos, and previous lectures. Individual and group lab reports will be assigned, and we will have weekly quizzes.

Required Readings and Videos

Required readings and video links will be available electronically on https://mycourses.rit.edu.
Recommended Textbook: Getting to Know ArcGIS Pro 2.6 (2.8 was just released and matches what you will have in the lab)

Course Assignments & Evaluation Method

- **Lab Assignments:** The ability to communicate a deep understanding of a technological perspective in a written and presentation format is an essential skill for all global citizens. For this reason, you will have individual lab assignments that will test your understanding of GIS concepts and how they relate to the past, current, and future challenges facing our world. A detailed grading rubric will be provided on MyCourses. Please submit all reports to the Assignment on MyCourses.
- **Midterm:** There will not be a midterm exam but rather a midterm short paper and presentation. All the information regarding the midterm requirements are posted in MyCourses. You will choose a global challenge (e.g. natural disasters, crime, poverty, disease spread, etc.) and will report how GIS is/could be used to help address this challenge. You will employ critical thinking to determine if geospatial thinking and technologies can help to achieve the UN Sustainable Development Goals. You will create maps to support your argument. There will be two deliverable check-ins before the midterm. A 2-page paper and 3-minute elevator pitch video are the final midterm products. *Find something related to your field and use this as a talking point for an interview! *
- **Final:**
  In project groups, you will identify a research question and answer your question by demonstrating what you have learned in this class. There will be two project deliverables that will assess your group's progress along the way. There will be class time allotted for you to work with your group, but it should not be the only time that you meet. As a group, you will create a research poster detailing the analysis, methods, data sources, results, and conclusions. Your final deliverable will be a storymap that works as both a report and a presentation of your project.
- **Late Assignments and Projects**
  All late assignments will be docked 10% for each day they are late(for a maximum of 5 days) unless alternate arrangements have been made with the instructor before the due date. Athletic exceptions require a note from the coach.
- **Class Participation**: Weeks that do not have an assignment due will have a mini discussion assignment**.** These mini assignments will include showing results from the demos in class or posting about discussions about the topic for the week. These will be assigned at the beginning of the week and are due by the start of next week.

Grading Policies: Your course grade will be determined as follows:

Item	**% Percentage**
Lab Assignments	40
Midterm	25
Final research project	25
Class Participation	10
Total	100%

Letter grades:

Grade	
A	93-100%
A-	90-92%
B+	87-89%
B	83-86%
B-	80-82%
C+	77-79%
C	73-76%
C-	70-72%
D	60-69%
F	< 60%

There is no curve grading nor will an incomplete be given.

Performing any non-class related activity with computers in the classroom during class time will not be tolerated. Use of cell/smart phones for activities such as texting, playing games or any other non-class related activity during class time will not be tolerated and will result in points reduced from assignments and class participation grade.

RIT Course Information

Academic Dishonesty

Students are expected to be familiar with and abide by the Academic Honesty Policy as stated in the RIT Student Rights and Responsibilities.

You may review the posted policy on the RIT Student Rights and Responsibilities web site (http://www.rit.edu/studentaffairs/studentconduct/rr_academicdishonesty.php).

This policy covers all courses at RIT unless otherwise noted by the instructor, the department, or the college in which the course is offered.

Plagiarism in any format will **NOT BE TOLERATED**. Academic prosecution of students caught plagiarizing can and will be conducted leading to failing grades for assignments and/or

expulsion and failure of the course. If you are unsure of what constitutes plagiarism and how to avoid it, err on the side of caution and consult this guide: https://library.rit.edu/instruction/dl/stud.html or the instructor for assistance.

ADA Statement

RIT is committed to fostering an environment where students with disabilities have the same access to academic programs, support services, social events, and physical facilities as every other student.

Please review the posted policy in the Students Rights & Responsibilities (http://www.rit.edu/studentaffairs/studentconduct/rr_disabilitiesservices.php) for further information and details on the application for accommodations.

The course will be accommodated for disabilities provided that they disclosed to the instructor the first week of classes. Do not wait until you are doing poorly in the course to request accommodation; poor grades will not be altered once earned. You must have current documentation from RIT's Office for Disability Services (ODS) that confirms your disability status and supports your request for academic adjustments, auxiliary aids, and services: http://www.rit.edu/studentaffairs/disabilityservices/index.php

Discrimination Statement

RIT is committed to providing a safe learning environment, free of harassment and discrimination as articulated in our university policies located on our governance website. RIT's policies require faculty to share information about incidents of gender based discrimination and harassment with RIT's Title IX coordinator or deputy coordinators, regardless whether the incidents are stated to them in person or shared by students as part of their coursework.
If you have a concern related to gender-based discrimination and/or harassment and prefer to have a confidential discussion, assistance is available from one of RIT's confidential resources on campus (listed below).
1. The Center for Women & Gender: Campus Center Room 1760; 585-475-7464; CARES **(available 24 hours/7 days a week)** Call or text 585-295-3533.
2. RIT Student Health Center – August Health Center/1st floor; 585-475-2255.
3. RIT Counseling Center - August Health Center /2nd floor - 2100; 585-475-2261.
4. The Ombuds Office – Student Auxiliary Union/Room 1114; 585-475-7200 or 585- 475-2876.
5. The Center for Religious Life – Schmitt Interfaith Center/Rm1400; 585-475-2137.
6. NTID Counseling & Academic Advising Services – 2nd Floor Lynden B. Johnson; 585-475-6468 (v), 585-286-4070 (vp).

Other Information

Likewise, it is strongly recommended that the instructor be contacted when a crisis occurs during the semester that affects your academic performance so accommodations can be made before poor attendance or classwork affects your grade.

Course Outline:

Schedule of Topics (Subject to Change)

Date	Topics
Week 1	Course overview, What is GIS, Finding GIS Data and Metadata
Week 2	GIS data (global datasets), metadata, coordinate systems *Last day for add/drop* Finding geographic data, creating and editing vector data
Week 3	Spatial SQL and Queries, Table Joins, Working with Excel data in ArcGIS Pro Digitizing
Week 4	Cartography and Thematic Mapping, Design Principles Case study: Relief Web Maps
Week 5	Vector-based geoprocessing (buffer, clip, dissolve) Case study: Global Risk modeling
Week 6	Spatial Statistics
Week 7	Working Week for Midterm
Week 8	**Midterm Due** Humanitarian Openstreet Map
Week 9	Geovisualization, hot spot analysis

Week 10	Network Data and Analysis Case Study: Humanitarian Logistics and Evacuation
Week 11	Introduction to Open Source GIS Tools
Week 12	Model Building: creating, running models, validation, executing tools Case study: Refugee camp natural disaster resilience model
Week 13	Final Project Working Week
Week 14	Final Project Working Week
Week 15	Final Project Working Week (Final Due on date of Final Exam)