Syllabus for ANT 521: GIS Applications 1, Fall 2020
Instructor: Dr. Tora Johnson, GIS Director, Office: Science 107A
NOTE: Due to the pandemic, I will rarely be in my office. The best way to reach me is email, cell call or text, or chat via Google or Facebook.
Phone: (207) 255-1214 (office) / (207) 266-2268 (cell) ~ Email: tjohnson@maine.edu
Office Hours (SUBJECT TO CHANGE): Tuesdays & Fridays 12 - 2pm & Wednesdays 3:30 - 5pm
or by appointment
YOU MAY RESERVE TIMES TO MEET WITH TORA DURING OFFICE HOURS BY PHONE OR ZOOM AT http://bit.ly/toraofficehours. If you are meeting via Zoom, check your email at your meeting time or simply log onto https://maine.zoom.us/j/2072551214. You may use audio via your computer microphone and speakers or via telephone: US: +1 646 876 9923 or +1 669 900 6833 or +1 408 638 0968 (in Canada: +1 647 558 0588). Meeting ID: 207 255 1214

Amy Dowley, Graduate Teaching Assistant: Torrey 223A, UMM
You may reserve times to meet with Amy during UMM GIS office hours or by phone or zoom on Tuesday and Wednesday evenings at https://bit.ly/2YtgiGA.
Email: amy.dowley@maine.edu or Google Chat.
Office Hours in UMM GIS Lab: Mondays 10am - 12pm & 1 - 2pm.

1. Class Meetings:

Blended Sections:
> Lectures: Mondays & Fridays from 8:30am-9:50pm via Zoom
> Labs: Tuesdays 8:30am-10:30am

Online Sections:
> Lectures: You may "attend" the live classes via the Internet or watch the recorded lectures at your convenience click the link on the course homepage to join the Zoom session.
> Labs: Complete exercises on your own.

Online Sections are also **REQUIRED** to attend three synchronous sessions. See our course website for details and to sign up for times. **SPACE IS LIMITED FOR SYNCHRONOUS SESSIONS, SO YOU MUST SIGN UP!**

IMPORTANT: All GIS 1 students are required to use the course website on Brightspace for assignments, quizzes, discussion forums, grades and streaming lectures. No work will be accepted via email.

2. Prerequisites: There are no prerequisite courses; however, students should have a working knowledge of Microsoft Windows. Experience with spreadsheets, elementary algebra, and general knowledge of descriptive statistics are helpful. Students will be expected to spend a significant amount of time in the lab or on their own computers to complete lab activities and manage independent projects.

Students in the blended section will have access to the UMM GIS laboratory in Torrey 223 until Thanksgiving Break. After break, students may only access the lab computers remotely or by special permission.

Students in the online sections and students in the blended section after break must either…
- Have a computer (Windows only) that meets the minimum system requirements for ArcGIS software (see details here). We will provide software for free.
OR

● Have a computer (Windows or Mac--no tablets or Chromebooks) and broadband internet access to remotely access a computer in the UMM GIS lab or Nutting 254 on the Orono campus. We will provide information about how to access the computers remotely in class.

Online students must have or have access to a broadband internet connection for watching lectures and downloading and uploading data for assignments. A webcam and microphone is recommended but not required.

3. Course Description: Students will build an understanding of the fundamentals of a GIS through lecture, readings, and computer activities. Students will learn to use a specific GIS software system, ArcGIS, and to define and complete a simple GIS project using existing data. This computer-intensive course includes a detailed discussion and related computer activities on the following topics: basic geography and map concepts, what a GIS is, data sources, data quality, databases, data classification, vector and raster data, spatial analysis, project management, cartographic communication, projections, datums, coordinates, and ethics. 3 credits.

NOTE: Requirements for the graduate section of GIS I are different from those for the undergraduate section. The differences are as follows:

● ANT 521 = 3 credits/ GIS 300 = 4 credits
● ANT 521 includes a literature review assignment not required in GIS 300.
● ANT 521 students are required to do a paper for their final project; GIS 300 requires a poster or a lesson plan.
● Rubrics for ANT 521 projects (but not problem sets or labs) are different, placing greater weight on written work.
● ANT 521 students are expected to do projects related to their thesis or dissertation work.

4. Learning Outcomes
● Ability to read maps, constructively critique their cartographic design, and evaluate how they communicate information
● Ability to make maps that effectively communicate information
● Proficiency in entry- to intermediate-level use of ArcGIS software
● Ability to recognize relevant elements of a "client's" needs, translate them into GIS data models and analytical processes, and use GIS software and methods to produce maps and/or information to address those needs
● Ability to design a cartographic model, use vector-based spatial analysis to execute that model, and use both spatial and non-spatial media to communicate methods and results
● Intermediate understanding of projections, coordinate systems and georeferencing
● Familiarity with the breadth and depth of applications of GIS technologies
● Familiarity with relevant principles of cartography, information science, geography, and design

4. Methodology: This course relies heavily upon learning ArcGIS software—the industry standard—along with other commonly-used applications and applying them to geographic problems. To this end, the course includes lab exercises, lectures, activities, assignments, and discussions intended to provide students with the knowledge, skills, and perspectives they need to understand and use GIS technology.

5. Activities and Assignments: Late assignments, without PRIOR arrangement with the instructor, will receive a reduced grade.

- <u>Lab Assignments</u>: There will be weekly lab exercises on the Esri website. You will be required to hand in on Brightspace a certificate for each.
- <u>Occasional Quizzes</u>: There will be short, occasional quizzes on Brightspace.
- <u>Problem Sets</u>: There will be three or four assignments that allow students to practice and apply the course concepts and skills. The problem sets may include map-making exercises, written responses and/or discussion in the online forum. Assignments must be submitted via Brightspace to receive full credit.
- <u>Literature Review</u>: Integrated review of literature relevant to final project work.
- <u>Final Project</u>: Each student will be responsible for identifying and completing a service-learning final project applying the course concepts and skills to a problem of interest. To accomplish this, students must find a "client" (a faculty member or local organization or business) who has a need that can be addressed with GIS, translate that need into a specific GIS project, construct a cartographic model, and use that model to guide the data collection and analyses necessary to create an effective and professional map-based product (hard copy and digital). In addition to maps, the project will include thorough documentation of the process and relevant background. STUDENTS IN ANT 521 SECTION ARE REQUIRED TO COMPLETE A LITERATURE REVIEW AS PART OF THEIR FINAL PROJECT.
- <u>Final Project Presentation</u>: Each student will create a 10 minute presentation of their final project and deliver that presentation in an on-campus class at the end of the semester.

6. Attendance and Class Participation Policy:
If you watch a lecture live, you will receive an attendance code to submit on Brightspace to receive attendance credit. If you watch a recorded lecture, you will be required to submit some evidence that you completed the activity we did in class or answer a question about the material covered.

You should plan to log into the course website at least three to four times per week

<u>Blended Students</u>: Attendance in live classes is required before Thanksgiving Break. However, if you miss a class, you may watch the recording as a make-up. If you need to be away from campus, you may attend the course via Zoom using the link on the course Brightspace page.

<u>Online Section Students</u>: Lectures are available in real time or streamed at the student's convenience. A link to live lectures is on the homepage of the course website. Recorded lectures will be available on the course website on the module page for that week. Recordings are typically posted by the following morning. **The three synchronous sessions are _required_ for online students. If you are available during class time, we STRONGLY RECOMMEND that you attend live. It's more fun, and it allows you to ask questions and get help in real time.**

<u>Participation</u>: In addition to participation in the lectures, labs and/or synchronous sessions, students are expected to contribute to class discussions on Brightspace for some problem sets over the course of the semester.

7. Evaluation: Grades will be calculated as follows:

a) Attendance & Participation (10%)
b) Quizzes (10%)
c) Laboratory Exercises (15%):

d) Problem Sets (30%): Students will earn full credit for assignments that may include required written, electronic and printed components in which the assigned questions and activities are addressed completely and directly.

e) Literature Review (5%): Integrated review of literature relevant to final project work.

f) Final Project and Presentation (30%): This is a major part of the course and must receive a significant amount of each student's attention. Final project topics must be approved in advance by the instructor. Projects on unapproved topics will not be accepted and will receive a failing grade. The grade for this project will be assessed based on data modeling and management, cartographic and graphic quality of maps or digital map products, thoroughness of documentation, and applicability to the problem being addressed. Each student must create a presentation that effectively presents the results of their GIS final project. Presentations awarded full points will be professional (well-rehearsed, high-quality products) and will clearly demonstrate the student's seriousness and perseverance.

8. Grading System

	-		+
A	90-92	93-97	98-100
B	80-82	83-87	88-89
C	70-72	73-77	78-79
D	60-62	63-67	68-69
F		<60	

9. Required Materials

How to Lie with Maps. (2018), 3ed. by Mark Monmonier; Univ. of Chicago Press.
● **ISBN-10:** 022643592X
● **ISBN-13:** 978-0226435923
NOTE: This is a new edition of the textbook!

The book is available from the following websites for under $25, and as an ebook for under $20:
● UMM Bookstore
● Half.com
● Barnes and Noble
● Amazon.com

You will need to use How to Lie with Maps beginning on September 7th.

Provided for free:
● Essentials of Geographic Information Systems by Jonathan Campbell and Michael Shin, 2011 ISBN 13: 978-1-4533219-6-6; Saylor Foundation https://open.umn.edu/opentextbooks/BookDetail.aspx?bookId=67
● Esri Virtual Campus Courses
● ArcGIS Desktop Help (free online) http://desktop.arcgis.com/en/arcmap/
● Additional readings, as assigned

10. Accommodations and Special Circumstances: If you have a disability for which you may be requesting an accommodation, please contact Student Accessibility Services, 121 East Annex, 581.2319, as early as possible in the term. Students who have already been approved for accommodations by SAS and have a current accommodation letter should meet with me, Tora Johnson, privately as soon as possible.

If you have ANY other circumstance that makes it difficult for you to feel comfortable in class, complete your coursework, or access education, please feel free to let me know. Even if you are taking the class from a distance, there is a lot I can do to help.

11. Academic dishonesty policies will be strictly enforced. Academic dishonesty is bad for everybody—it's disrespectful to the cheater's fellow students and instructor, and most important, it does a disservice to the cheater. You are expected to abide by the expectations and responsibilities of academic trust as outlined in the University of Maine System's Academic Integrity Policy found at the following address: https://www.maine.edu/board-of-trustees/policy-manual/section-314/.

Assignments that are flawed by academic dishonesty will receive a zero. Two incidences of academic dishonesty will result in a failing grade for the course. **All instances of academic dishonesty will be reported to the Vice President for Academic Affairs and the Student Conduct Office.** A special consideration when using GIS data: Students must cite the source of all spatial and attribute data provided by or derived from outside sources and must abide by data usage guidelines of the data product provider.

12. A Safe and Respectful Space to Learn: NO DIScounts! In this class, you must treat your classmates, your teacher, lab staff, and yourself with respect. Let's work together to make the lab and our online space a safe, pleasant, and functional place to work and learn for everyone. Be considerate, quiet, neat, helpful, and supportive. If someone is doing something inappropriate in class, please tell me immediately.

IN CLASS, DO NOT text, peruse or post on social media, play video games, surf the web for things unrelated to class, etc.

DO NOT post or say hostile, derisive or otherwise inappropriate comments.

If I catch you doing these rude things, I will call you out immediately, and you will feel very bad. Persistent disruptive behavior in class or online will be grounds for removal from the class, which will make you feel even worse. You will get an F in the class and will not receive a refund on your tuition.

14. COVID-19 is an infectious disease caused by the coronavirus SARS-CoV-2. The virus is transmitted person-to-person through respiratory droplets that are expelled when breathing, talking, eating, coughing or sneezing. Additionally, the virus is stable on surfaces and can be transmitted when someone touches a contaminated surface and transfers the virus to their nose or mouth. When someone becomes infected with COVID-19 they may either have no symptoms or symptoms that range from mild to severe and can even be fatal. During this global pandemic, it is imperative that all students, faculty, and staff abide by the safety protocols and guidelines set forth by the university to ensure the safety of our campus. All students are encouraged to make the Clippers Care Pact/ Black Bear Care Pact to protect the health of themselves, the health of others, and the college of our hearts always.

For the health and safety of our community, only students in the blended section will have access to the GIS lab in Torrey 223 to do their GIS classwork. Please see the lab guidelines below. Students will not be allowed to physically enter the lab in Nutting 254. Instead, online students will be able to access lab computers in Torrey at UMM or Nutting at UM to do their classwork remotely.

Course Schedule Disclaimer (Disruption Clause): In the event of an extended disruption of normal classroom activities, the format for this course may be modified to enable its completion within its programmed time frame. In that event, you will be provided an addendum to the syllabus that will supersede this version.

15. Observance of Religious Holidays/Events: The University of Maine recognizes that when students are observing significant religious holidays, some may be unable to attend classes or labs, study, take tests, or work on other assignments. If they provide adequate notice (at least one week and longer if at all possible), these students are allowed to make up course requirements as long as this effort does not create an unreasonable burden upon the instructor, department or University. At the discretion of the instructor, such coursework could be due before or after the examination or assignment. No adverse or prejudicial effects shall result to a student's grade for the examination, study, or course requirement on the day of religious observance. The student shall not be marked absent from the class due to observing a significant religious holiday. In the case of an internship or clinical, students should refer to the applicable policy in place by the employer or site.

16. Sexual Discrimination Reporting: The University of Maine is committed to making campus a safe place for students. Because of this commitment, if you tell any of your teachers about sexual discrimination involving members of the campus, your teacher is required to report this information to Title IX Student Services or the Office of Equal Opportunity.

Behaviors that can be "sexual discrimination" include sexual assault, sexual harassment, stalking, relationship abuse (dating violence and domestic violence), sexual misconduct, and gender discrimination. Therefore, all of these behaviors must be reported.

Why do teachers have to report sexual discrimination? The university can better support students in trouble if we know about what is happening. Reporting also helps us to identify patterns that might arise – for example, if more than one victim reports having been assaulted or harassed by the same individual.

What will happen to a student if a teacher reports? An employee from Title IX Student Services or the Office of Equal Opportunity will reach out to you and offer support, resources, and information. You will be invited to meet with the employee to discuss the situation and the various options available to you.

If you have requested confidentiality, the University will weigh your request that no action be taken against the institution's obligation to provide a safe, nondiscriminatory environment for all students. If the University determines that it can maintain confidentiality, you must understand that the institution's ability to meaningfully investigate the incident and pursue disciplinary action, if warranted, may be limited. There are times when the University may not be able to honor a request for confidentiality because doing so would pose a risk to its ability to provide a safe, nondiscriminatory environment for everyone. If the University determines that it cannot maintain confidentiality, the University will advise you, prior to starting an investigation and, to the extent possible, will share information only with those responsible for handling the institution's response

The University is committed to the well-being of all students and will take steps to protect all involved from retaliation or harm.

If you want to talk in confidence to someone about an experience of sexual discrimination, please contact these resources:

For *confidential resources on campus*: Counseling Center: 207-581-1392 or Cutler Health Center: at 207-581-4000.

For *confidential resources off campus*: Rape Response Services: 1-800-871-7741 or Partners for Peace: 1-800-863-9909.

Other resources: The resources listed below can offer support but may have to report the incident to others who can help:

For *support services on campus*: Title IX Student Services: 207-581-1406, Office of Community Standards: 207-581-1409, University of Maine Police: 207-581-4040 or 911. Or see the OSAVP website for a complete list of services at http://www.umaine.edu/osavp/

15. Tech Support is available at Support Home » Support
- Phone support: Monday - Friday, 8 AM - 4:30 PM 1-800-696-4357 or Email: help@maine.edu
- Live Chat Support is available Monday-Friday, 8 AM - 8 PM and Saturdays & Sundays, 10 AM - 6 PM
- Brightspace Navigation and Tutorial Links for Students:
  - **Brightspace Student Video Tutorials**

16. Library Information: Merrill Library is here to serve you! Come in to study, read, and research. You can reach us via Chat, Zoom, Email, and phone (255-1234). Take a look at our Library Orientation page and our FAQs for a quick start. For more "How To" take a look at our Research Guides.

Some Advice:

- You should plan on spending at least 5 to 10 hours per week doing GIS work. So please inspect your personal weekly schedule to be sure that you budget sufficient time. You will have several problem sets due in quick succession over the course of the semester. Be careful of falling behind in the class. Late assignments will get low grades, and you can leave yourself in a real jam with your project if you fall behind. If you start slipping behind, talk to your instructor as soon as you can so we can work on getting you caught up.

- We will be using software that is the industry standard for GIS. Though it is very powerful and versatile (that's why so many people use it), it is notoriously temperamental. Save often and don't get too attached to doing things in one particular way—often you will need to work around difficult problems. Breathe, be patient, and ask for help. Don't try to memorize all the buttons and steps; it's impossible. Instead use a heuristic, "trial and error" approach to solving problems.

- Communicate with your instructor, TAs, and classmates about problems you encounter or questions you have. You will save yourself lots of time and frustration if you draw on as many resources as you can to solve GIS problems (that's how we do it in the "real world"). It's not cheating as long as all your assignments are written in your own words and reflect your own work.

- Feel free to call me on my cell (voice or text) or send a message on Facebook or Google Chat. However, please don't call or text before 8am or after 9pm unless it's an actual emergency. I actually WANT you to call with problems, rather than spending hours in frustration. Ultimately, it will save us all time and help you learn and progress.

- Plan to spend several hours per week outside of class time to complete your assignments. It's a good idea to block out time in your schedule to spend in the lab or at your computer. That way you will be sure to devote the time and won't schedule over it. Also, expect to spend more time toward the end of the semester.

- "But I only need to make one map for my project," you say. "I can probably pull a couple of all-nighters during finals week to get it done." Don't count on it. Your project will involve generating new map layers, and the technology is not always cooperative—especially during finals week.

- DO make yourself comfortable in the lab whenever you are there. Feel free to adjust the positions of chairs, monitors, mice, and keyboards.

- DO NOT plagiarize in your written assignments. Answers for all assignments should represent your original work and your own words. That means you should NEVER, EVER copy material in print or online or from any other source without setting it apart in quotes or by indentation and using proper and complete attribution. A quote will NEVER, EVER constitute a complete answer to an assigned question and may only be used as supporting information to your original answers.

- DO NOT plagiarize maps or GIS data. Assigned maps should be designed by you and must not be made from existing templates or symbologies, except where the assignment calls for a template (group projects will often involve templates, for example). Maps made from unassigned templates will not be accepted. Typically, yellow "layer" files with the .lyr extension and map template files with the .mxt extension are not to be used to make a new map, unless your assignment specifically calls for them.

Wk	Date	Topic	Reading	Assigned	Due	Weekly Lab Readings & Exercises	Synchronous Sessions for Online Sections (ATTEND ONE OF EACH)
1	Aug 31	Introduction; What is a GIS?; Geospatial Competencies; GIS Applications; What is a Map? Make your First Map	What is GIS? Read all sections, including the History and Careers sections, & view the story maps under the GIS Showcase (they're fun!). Essentials, Chapter 1: Introduction	Online Student Information Survey & Scheduling Form	Online Student Information Survey & Scheduling Form	Exploring GIS Maps (AGOL) NOTE: You will need to use your ArcGIS Online login!	Online Sections: Required Synchronous Session 1 Software Setup; Intro to ArcGIS; Get Started with Labs; Map Critique See Brightspace to sign up for a session in Week 1 or 2.
2	Sept 7 NO MONDAY CLASS LABOR DAY	Map Types; Data & Information; Naming Conventions; Data Management; Queries: Select by Attributes	Monmonier, Chapter 1: Introduction & Chapter 2: Elements of a Map Essentials, Chapter 2, Section 1: Map Types Essentials, Chapter 3: Data, Information, and Where to Find Them			Getting Information from a GIS Map (AGOL) AND Using GIS to Solve Probems (AGOL)	
3	Sept 14	Thematic Maps; Working with Attribute Tables; Attribute types, classification & unique values maps;	Essentials, Chapter 6: Data Characteristics and Visualization ArcGIS Help Tables and Attributes	PS 1: Modify Attribute Table & Make Choropleth Map		Map Voter Data to Plan Your Campaign (AGOL) Submit a link to your presentation--make sure to share it! AND	

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Dates are subject to change. Visit the course website for current info.

		Aerial Unit Aggregatio n (MAUP)				[Displaying Coordinate Data on a Map (AGOL)](#)	
4	Sept 21	Heuristics; Intro to ArcGIS Pro; Relational Databases, Joins & Relates; Select by Location	Monmonier, Chapter 3: Map Generalization & Chapter 11: Data Maps		**PS 1**	[ArcGIS Pro Basics](#) **AND** [Begin Getting Started with ArcGIS Pro](#)	
5	**Sept 28**	Existing Data Sources; Online Service Sources; Reference Maps; Map Conventio ns; Scale; Coordinate s & Coordinate Systems	[Essentials, Chapter 2.2 & 2.3](#) [ArcGIS Help Projection Basics & The Geoid, Ellipsoid, etc](#) Monmonier Appendix	PS 2: Mississippi River System Map (Pro) & Online Map Critique		[Finish Getting Stared with ArcGIS Pro](#)	
6	**Oct 5**	Geodesy & Projections	[ArcGIS Help: Projected Coordinate Systems (ALL SECTIONS)](#)		**PS2**	[Creating a Map Layout (Pro)](#) **AND** [Introductio n to Spatial Data (Pro)](#)	**Online Sections: Required Synchronous Session 2** **Work on PS; Discuss Final Projects; Data Issues** **See Brightspace to sign up for a session in Week 6 or 7.**
7	**Oct 12 NO MONDAY CLASS INDIGENO**	Map Design Elements & Principles;	[Essentials, Chapter 9: Cartographic Principles](#)	PS 3: World Map Projections (Pro), Reference		[Introductio n to Coordinate Systems (Pro)](#)	

	US PEOPLES' DAY	Color in Maps; Modifiable Areal Unit Problem	Buckley "Design Principles for Cartography" Molecular Expressions Primary Color Materials (All links within the text) Molecular Expressions Ishihara Colorblindness Test Page	Map (Pro) & Redesign of PS 1 Map (AGOL)		**AND** Managing Map Layers in ArcGIS Pro
8	**Oct 19**	The Final Project; Raster & Vector Data Models; Important Raster Types	Essentials, Chapter 4: Data Models for GIS Essentials, Chapter 5: Geospatial Data Management	Final Project		Querying Data Using ArcGIS Pro **AND** Labeling Features using ArcGIS Pro
9	**Oct 26**	Topology & Data Formats; Creating vector GIS data	Essentials, Chapter 10: GIS Project Management		**PS 3**	Editing Basics in ArcGIS Pro **AND** Getting Started with Geoprocessing
10	**Nov 2**	Spatial Analysis/ Geoprocessing Basics, Overlay & Proximity	Essentials, Chapter 7: Geospatial Analysis I: Vector Operations ArcGIS Help Geoprocessing Introduction (ALL SECTIONS)	**ANT 521 Students: Literature Review** PS 4: Beaver Model	**Project Proposal**	Integrating Data in ArcGIS Pro **AND** Introduction to Suitability Modeling

11	Nov 9 NO WEDNESDAY CLASS VETERANS' DAY	Modeling-Muskrat Habitat Suitability Model				[Building Geoprocessing Models Using ArcGIS Pro](#)	
12	**Nov 16**	Fun with Satellite Data, Wrap Up PS4 & Catch Up			**PS 4**	[Sharing Maps and Layers with ArcGIS Pro](#)	
13	Nov 23 THANKSGIVING BREAK BEGINS NOV 25				**ANT 521 Students: Literature Review**		
14	Nov 30 BEGIN ONLINE ONLY (REMOTE LAB ACCESS ONLY FOR BLENDED SECTION)	Metadata; Fun with Basic Surface Analysis & Project work				[Extra Credit: Telling Stories with GIS Maps](#)	Online Sections: Required Synchronous Session 3 Project Work; Presentations See Brightspace to sign up for a session in Week 14 or 15.
15	**Dec 7**	Making a Poster; Project Presentations			Project Update	Project Work	
Finals	**Dec 14**	**FINALS WEEK Complete Final Project due by midnight Thursday, Dec 17th**					