Syllabus: Applications of GIS (FORS 350 / GPHY 488)

Instructor
- Dr. Kyle Bocinsky
- **Office:** Forestry 307
- kyle.bocinsky@umontana.edu

Teaching Assistant
- Patrick Benson
- **Office:** Stone 213
- **Student Hours:** W 1:00–2:00

Course details
- **Lecture:** Tu/Th, 2:00–2:50, Forestry 305
- **Lab:** W 2:00–3:50, Th 3:30–5:20, Stone 218

Contacting me
- **Student Hours:** Tu 3:00–4:00, W 4:00–5:00, or by appointment
- **The best way to get reach me is to visit my student hours.** If necessary, I can be reached by email or Teams chat.

TL;DR

Good try! Read the syllabus. It is your best bet for success in this course, and any other courses you may be taking.

OVERVIEW

GIS is the science of answering spatial questions with the proper use of geographic information. The main concern is the analytical application of tools for investigating the distribution of physical and cultural phenomena on the surface of Earth. Unfortunately, the majority of maps in the modern discourse grossly distort the data and lie to the user. This most likely stems from a lack of basic cartographic knowledge and usually happens when a graphic designer is tasked with throwing data on a map. Decades of academic study into user perceptions, proper data management, and effective techniques inform a large body of geographic science that we will use as a foundation for applied GIS analysis. You will learn to ask appropriate spatial questions, construct methods for analysis, and produce maps that truthfully represent the answers.

The course will discuss major concepts and theories behind several GIS applications and put those skills into practice with laboratory exercises using GIS software. We will sample

the use of GIS science in multiple disciplines, highlighting the unique skills required to effectively use GIS in those fields.

Objectives
- To learn the tools of spatial analysis in order to properly make spatial decisions in a variety of GIS applications.
- To understand the structure and analysis of nominal, ordinal, interval, and ratio data in a spatial context.
- To become proficient in the construction of choropleth, dot density, proportional symbol, isarithmic, and cartogram maps.
- To develop software skills in programs used for GIS analysis in the modern geographic information workflow.
- To learn to overcome software limitations and produce aesthetically pleasing maps that convey design rather than automatic generation.

Learning Outcomes

By the end of this course you will:

1. Understand the terminology, structures, concepts, and theories of GIS project management.
2. Gain necessary skills to perform spatial analyses using various data within a GIS environment.
3. Learn common GIS applications associated with managing natural and cultural resources.
4. Be proficient in applying the scientific methods to spatial problem solving.
5. Know the proper styles and formats for documenting research in a scientific report.

COURSE FORMAT

The general program for each week will be Tuesday and Thursday lectures, followed by a lab section. However, this schedule is subject to change, and will vary with the needs of the class, workload, or in special circumstances. This is especially true towards the end of the semester.

Lecture days will start with announcements, and then move to group map critiques or class discussion of readings. This will be followed by a lecture on principles of GIS.

On occasional Thursdays during the lecture hour, we will hear from *Voices of GIS*. I have invited several people I feel are doing impactful work with geospatial data to join us in class and be interviewed. Each guest speaker will share a tool, paper, app, or analysis thy have had a hand in developing, and we'll have a discussion about potential geospatial careers in their field. **You will be responsible for submitting thoughtful questions for our guests ahead of time.** I'll parse through your questions and let them guide the interviews.

New lab assignments will be introduced during Tuesday lectures and will be due a week after they are assigned. The majority of the labs will not be written up in a button-by-button click format. You are expected to refer back to previous skills learned in other courses, tutorials provided by the instructor, the ESRI Help directory and outside resources found on the web. Utilize your time in the labs to ask questions of your fellow students, the TA, and the instructor.

COURSE MATERIALS

I will provide slides, and sometimes notes. In addition to those, there will be assigned readings from textbooks and reference papers.

Course Software

The labs are written for ArcGIS Pro 3.2.1 (ArcPro). ArcPro is installed on the computers in the lab in Stone Hall. You are welcome to use your own computers for the labs if you'd like, but beware as your mileage may vary. I've prepared installation instructions for Windows, MacOS (Apple Silicon), and MacOS (Intel), and the course instructors will be available during the lab section on Thursday, January 18 to troubleshoot getting it up and running on your computers. Access to ArcPro is provided at no cost to students. Be mindful of the ArcPro system requirements, but note my instructions on how to get it up and running on MacOS.

Students are welcome to attempt to do the labs using alternative software, such as QGIS, R, or Python. You won't be graded on the software you use, only on the quality of your writeup and results. The course instructors will try to advise and assist with other software as best they can.

Course Texts

Course notes for the class can be found on the course website. There will also be assigned readings from Mapping, Society, and Technology (Manson, 2017), which is available online for free reading. There will be various supplemental readings supplied as pdfs throughout the semester. The GIS&T Body of Knowledge is an impressive resource for geographic information sciences, and you'd be wise to familiarize yourself with it.

Storage

UM FCFC File Server ("T:\\ Drive")

The FCFC IT team has created a folder for our GISApps class under our **Classes/GISApps** folder on the UM FCFC file server. **The *Classes/GISApps* folder is by far the easiest place to store your ArcPro data while in this class.**

The Classes folder will automatically map for everyone in the Stone Hall labs as the "T:\\" drive. However, if you need to access the drive from the library or another location on campus, you need to follow the instructions below to map the **Classes** drive. You need to be connected to ethernet on campus, or *eduroam* wifi to access the **Classes** folder.

Drive mapping instructions: https://umtqsg.atlassian.net/l/cp/Pp2Vgu2M

- Server and Share name for Windows: **\\data.cfc.umt.edu\Classes$**
- **smb://data.cfc.umt.edu/Classes$** for MacOS (available via the **Finder menu bar → Go → Connect to Server…**)
- Username: **first.last@umt.edu** and your normal password

That will take you to the root of the classes folder, you can see some instructions for signing into available software and general lab info in the root of that folder. Your folder is GISApps and within that, you will see a **Labs** folder and a **Students** folder. **Labs** is intended to store materials/data that that we will share with you prior to the labs. **Students** will contain a folder for each student in our class where you can store whatever they want/need and is named with your NetID. The only folder students may view or modify is their own folder. The **Labs** folder is read only for students.

Flash Drive (optional)

A thumb-drive or external hard drive with at least 4 GB of space may prove useful.

Pro tip: Create a Word doc on the drive called "1st Owner Information." Use the number one in the title and it will always be on top in the file list. Type up all you contact information so when you lose your drive it can be returned.

IMPORTANT DATES

Please keep these dates in mind this semester. The course instructors will try and remind you about them. A more complete list of dates, including information on residency classification and adding classes, is available on the UM Registrar website.

Feb. 7. 2024
Last day to drop individual classes on CyberBear with no W on transcript; refunds where applicable. Spring registration bill payment deadline.

March 28, 2024
Last day to drop a class without Dean approval. Students will receive a W on their transcript.

May 3, 2024
Last day to drop a class. Requires Dean, instructor, and advisor approval. A WP or WF will appear on the transcript for dropped classes.

May 17, 2024
Grades post to CyberBear and to student transcripts on or around this date.

STUDENT HOURS

I am available Tuesday after class from 3:00–4:00, Wednesday after lab from 4:00–5:00, and by appointment. My office, Forestry 307, is located next to the lecture hall for this class (Forestry 305) and across from the Coke machine. Additionally, the course TA, Patrick Benson, will have student hours from 1–2pm on Wednesdays in Stone Hall 213.

Please watch this video:

Student hours are set times dedicated to all of you (most professors call these "office hours"; I don't[1]). This means that I will be in my office waiting for you to come by if you want to talk to me in person (or remotely) with whatever questions you have. This is the best and easiest way to find me and the best chance for discussing class material and concerns.

COURSE CONTENT

Below is a tentative schedule for the semester. A more complete, day-by-day schedule is available on the Schedule page, but is subject to change.

1. **Introduction and motivation**
   – Welcome, Syllabus, Moodle, Labs, Resources
2. **Review & points of departure**
   – How is GIS applied to the scientific method?
   – Projection, Scale, and Geodatabases
   – Scales of Measurement
   – Review of Spatial Reference
3. **Whence geospatial data?**
   – Whence Geospatial Data I: All data are spatial
   – Whence Geospatial Data II: (Mis)Placing things
   – Whence Geospatial Data III: Humans in space
4. **GIS and the analytical mind**
   – GIS as process: Organizing space, data, and analysis
   – GIS as workflow: Introducing the Model Builder
   – **LAB 1**: Exploring the Model Builder
5. **Communicating with maps**
   – Quantitative maps: Choropleth Mapping
   – Type & Color
   – **LAB 2**: Choropleth maps

---

[1] There's fairly widespread misunderstanding about what office hours actually are! Many students often think that they are the times I *shouldn't* be disturbed, which is the exact opposite of what they're for!

- – Qualitative maps: Classification
- – **LAB 3**: Graduated Symbol Maps

6. **Storytelling with maps**
   - – Spatial Storytelling I: A Human Tradition
   - – Spatial Storytelling II: Introducing ESRI StoryMaps
   - – **LAB 4**: Exploring StoryMaps
   - – Spatial Storytelling III: Maps in the Media
   - – **LAB 5**: Isarithmic Maps — Climate Analysis

7. **Lying with maps**
   - – Lying with Maps I: Little white lies
   - – Lying with Maps II: Placemaking and placetaking

8. **Applications of GIS**
   - – Watershed Hydrology in GIS
   - – Mapping Montana's Climate

9. **Tell your story**
   - – Final Project Presentations

EVALUATIONS AND GRADES

You can find descriptions for the assignments on the evaluations page. There are **2000** total points available in this course; so far, **20** points have been assigned (this will update as the semester progresses). To calculate your current grade at any point, simply divide the number of points you've earned by the number of points that have been assigned thus far.

Assignment	Points	Awarded
Syllabus Quiz	10	—
Participation/Quizzes/Check-ins	140	20
Map Tutorials (3 x 50)	150	—
Labs (5 x 100)	500	—
Resource Notebook	100	—
Voices of GIS Questions (5 x 10)	50	—
Midterm Exam	200	—
Final Exam	250	—
Final Project	600	—
Total	**2000**	**20**

Grade	Points	Percentages	GPA
A	1800–2000	90–100%	4
B	1600–1799	80–89%	3
C	1400–1599	70–79%	2
D	1200–1399	60–69%	1
F	<1200	<60%	0

COURSE POLICIES

Expectations

Emails

On a daily basis, I receive 40–50 emails that are related to the work that I do for the university. I often spend several hours a day reading and responding to emails. Before emailing me, please read the syllabus to see if your question is answered in the syllabus. Try to ask assignment questions in class when I ask if there are any questions. For questions you may not want to ask in front of the whole class, you may speak to me after class. If none of those options will work, please email me or see me during student hours.

When emailing, please compose a polite, concise email *from your UM email address* with a clear subject line. This will ensure that your email isn't inadvertently sent to my junk mail.

All professors and TAs are only expected to respond to emails during working hours and business days, and generally within two business days. Don't expect responses on the weekends. If I don't get back to you within 2 business days, please email me again.

Classroom Participation

Students are expected to attend all classes in person unless they have communicated a reason for absence with the instructor—if you are going to miss class, please communicate that to me ahead of time. Students are individually responsible for all information presented in lectures, *Voices of GIS* interviews, assigned readings, and class assignments. Classroom participation will be assessed via attendance, attention, pop-quizzes, and active participation in group-discussions. There will be several unannounced reading and participation quizzes. Combined, these quizzes and your participation total 10 percent of your grade. Thus, consistent attendance and regularly doing the readings are required to do well in the course.

Cultural Leave Policy

Cultural or ceremonial leave allows excused absences for cultural, religious, and ceremonial purposes to meet the student's customs and traditions or to participate in related activities. To receive an authorized absence for a cultural, religious or ceremonial event the student or their advisor (proxy) must submit a formal written request to the instructor. This must include a brief description (with inclusive dates) of the cultural event or ceremony and the importance of the student's attendance or participation. Authorization for the absence is subject to approval by the instructor. Appeals may be made to the Chair, Dean or Provost. The excused absence or leave may not exceed five academic calendar days (not including weekends or holidays). Students remain responsible for completion or make-up of assignments as defined in the syllabus, at the discretion of the instructor.

Family Policy

UM does not have an official family policy, so the following guidelines reflect my own beliefs and commitments towards parent students[2]

1. Babies are welcome in class as often as necessary for support feeding relationship.
2. You are welcome to bring your child to class in order to cover unforeseeable gaps in childcare.
3. If you come with babies or toddler, I ask that you sit close to the door so that, in case your little one needs special attention and is disrupting the learning of other students, you may step outside of class until their needs are met. Seats close to the door are reserved for parents attending class with their child.

Late Assignments and Exams

The lab write-ups and assignments due in class on the day indicated in the assignment description, generally the Thursday of the following week. Late lab write-ups or other assignments will not be accepted. If you anticipate problems with any deadlines, talk with or notify me prior to missing an assignment or exam. Make-up exams will only be given in the rarest of circumstances.

Classroom Etiquette

As a learning community, it is important for us to work together to ensure that we are fostering a positive and respectful learning environment for all. Below are some selected guidelines.

- Please ensure that you are prepared for class by doing the assignments, having supplies in hand, and being prepared to learn and participate.

---

[2] Shamelessly stolen/adapted from similar policy by Drs. Melissa Cheney, Guy Grossman and Rohan Alexander

- Note-taking with devices (e.g. laptops, iPads) is allowed, but please stay on task. Doing other homework, checking your Reddit, Snapchat, Tik Tok, stocks, the UM basketball score, or anything else not related to the class is not only distracting to you but also to your neighbors.
- Please be considerate about your food choices, especially those that are noisy or particularly odorous. Coffee is encouraged.
- Unless we are doing group work, please do not carry on private conversations with others.
- While I do want you to enjoy this course, please be respectful and act professionally towards your colleagues and me.
- Please do not text while I am lecturing. Why? It is really distracting to me.

Disruptive Behavior

Faculty members at the University of Montana have the independent authority to exclude a student from any class session in which the student displays disruptive behavior that threatens the learning environment and/or safety and well-being of others in the classroom.

1. If circumstances warrant dismissal from a class session for behavior reasons, the faculty member should contact the Student Conduct Officer immediately following the class to discuss the situation and make a determination about whether Student Conduct Code charges will be initiated.
2. The student remains eligible to return to the next class session.
3. The faculty member maintains the authority to remove the student from any future class session during which the student is disruptive.
4. The student may be suspended permanently from a class upon recommendation of the Dean of the college or school offering the class in accordance with the disciplinary procedures outlined in the *Article V: Proscribed General Conduct* section of the Student Conduct Code.

Academic Conduct

For a full list of regulations and procedures please see the Student Conduct Code.

Students at the University of Montana are expected to practice academic honesty at all times. Academic misconduct is subject to academic penalties by the course instructor and/or University sanctions by the University through the Provost and Vice Provost for Academic Affairs.

Academic misconduct is defined as all forms of academic dishonesty, including but not limited to:

1. **Plagiarism:** Representing another person's words, ideas, data, or materials as one's own.
2. **Misconduct during an examination or academic exercise:** Copying from another student's paper, consulting unauthorized material, giving information to another

student, collaborating with one or more students without authorization, or otherwise failing to abide by the University or instructor's rules governing the examination or academic exercise without the instructor's permission.

3. **Unauthorized possession of examination or other course materials:** Acquiring or possessing an examination or other course materials without authorization by the instructor.
4. **Tampering with course materials:** Destroying, hiding, or otherwise tampering with source materials, library materials, laboratory materials, computer equipment or programs, or other course materials.
5. **Submitting false information:** Knowingly submitting false, altered, or invented information, data, quotations, citations, or documentation in connection with an academic exercise.
6. **Submitting work previously presented in another course:** Knowingly making such submission in violation of stated course requirements.
7. **Improperly influencing conduct:** Acting calculatedly to influence an instructor to assign a grade other than the grade actually earned.
8. **Substituting, or arranging substitution, for another student during an examination or other academic exercise:** Knowingly allowing others to offer one's work as their own.
9. **Facilitating academic dishonesty:** Knowingly helping or attempting to help another person commit an act of academic dishonesty, including assistance in an arrangement whereby any work, classroom performance, examination activity, or other academic exercise is submitted or performed by a person other than the student under whose name the work is submitted or performed.
10. **Altering transcripts, grades, examinations, or other academically related documents:** Falsifying, tampering with, or misrepresenting a transcript, other academic records, or any material relevant to academic performance, enrollment, or admission, or causing falsification or misrepresentation of any of the above.

Penalties for academic misconduct

Depending on the severity of the academic misconduct, a student may incur one or more of the following penalties:

1. **Academic Penalty(ies) by the Course Instructor:** The student may receive a failing or reduced grade in an academic exercise, examination, or course, and/or be assigned additional work which may include re-examination.
2. **University Sanction(s):** The University may also impose a sanction that exceeds the academic penalty. Sanctions (c) through (f) require administrative review and approval by the Provost and Vice Provost for Academic Affairs:
a. **Disciplinary Warning:** The student is warned that further misconduct may result in more severe disciplinary sanctions.
b. **Disciplinary Probation:** The student is warned that further misconduct may result in suspension or expulsion. Conditions may be placed on continued enrollment for a specified period of time.

c. **Suspension:** The student is separated from the University for a specified period of time and may also be excluded from participation in any University-sponsored activity.
d. **Expulsion:** The student is permanently separated from the University and may also be excluded from any University-owned and/or -controlled property or events.
e. **Denial of a Degree:** A degree is not awarded.
f. **Revocation of a Degree:** A previously awarded degree is rescinded.

A Note on GenerativeAI

UM does not currently have a specific policy on the use of generative artificial intelligence (AI), as this is a new and rapidly developing technology. As such, I reviewed emerging guidance on the use of AI in courses such as this one. I've adapted the following statement from a resource at North Carolina State University. Most of the text was adapted from a conversation with the AI tool Bing Chat (powered by GPT-4).

This course permits you to use AI tools, such as chatbots, text generators, paraphrasers, summarizers, or solvers, to get guidance on assignments, as long as you do so in an ethical and responsible manner. Essentially, you can think of these tools as ways to help you learn (and to problem-solve particular ArcGIS tasks) but not to entirely create text for assignments like labs, final projects, discussion wuestions. AI is more like your tutor or TA, not a replacement for your independent thinking.

This means that you must:

- Not use AI tools to replace your own thinking or analysis or to avoid engaging with the course content.
- Cite or explain any AI tools you use. Provide the name of the AI tool, the date of access, the URL of the interface, and the specific prompt or query you used to generate the output. This is especially critical for any creative solution you come across.
- Be transparent and honest about how you used the AI tool and how it contributed to your assignment. Explain what you learned from the AI tool, how you verified its accuracy and reliability, how you integrated its output with your own work, and how you acknowledged its limitations and biases.

You are accountable for any mistakes or errors made by the AI tool. Do not rely on the AI tool to produce flawless or correct results. Always check and edit the output before submitting your work. If you discover any inaccuracies or inconsistencies in the output after submission, notify the instructor immediately and correct them as soon as possible.

Using AI tools in an unethical or irresponsible manner, such as copying or paraphrasing the output without citation or transparency, using the output as your own work without verification or integration, or using the output to misrepresent your knowledge or skills, is considered a form of academic dishonesty and will result in a zero grade for the assignment and possible disciplinary action. If you have any questions about what constitutes ethical

and responsible use of AI tools, please consult with the instructor before submitting your work.

Also, please remember that AI tools are only as unbiased as the data they are trained on. If the training data for the AI includes bias, the results generated by the AI will also be biased. In this way, AI tools can perpetuate the biases present in their original training sets, leading to discrimination against certain groups of people and reinforcing pre-existing inequalities and stereotypes. I encourage you to reflect on the limitations and potential biases of AI-generated content and to use it responsibly.

University Resources

Accessibility

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and the Office for Disability Equity (ODE). If you have a disability that adversely affects your academic performance, and you have not already registered with the ODE, please contact them in Lommasson Center 154 or 406.243.2243. I will work with you and ODE to provide an appropriate modification.

Office of Equal Opportunity, Title IX and Mandatory Reporting

The Office of Equal Opportunity and Title IX supports UM's commitment to diverse and inclusive working and learning environments free from all forms of discrimination, harassment, and sexual misconduct. We work to eliminate barriers inhibiting individuals from achieving their full potential in education, employment, and other programs at the University. To learn more: https://www.umt.edu/equal-opportunity-title-IX/

Please be aware that all university employees must, within 24 hours of receiving the information, report information they have about discrimination based on sex and sexual harassment involving students, as defined by UM's Discrimination, Harassment, and Retaliation Policy, to the EO/Title IX Coordinator. The employee must provide the EO/Title IX Coordinator with all information they have directly related to the incident. This includes, but is not limited to the names of people involved, as well as facts, including the date(s), time(s), and location(s). Dr. Bocinsky is subject to this reporting.

Curry Health Center Counseling

Curry Health Center Counseling assists students by addressing their personal counseling and psychotherapy needs for the purpose of helping them gain the most from their time on campus. When a student's mental health care needs are beyond the scope of our services, we will assist with referrals to community-based providers for specialized or longer-term care.

Services provided:

- Individual Counseling (telecounseling only)
- Group Therapy - (telecounseling only)
- Topical Seminar - (telecounseling only)

- Urgent one-time Appointments Available
- Limited Psychological Assessments
- Psychiatric Consultation
- Consultation with concerned others
- Referrals to community-based resources
- Behavioral Health Options for alcohol, other drugs, gambling, and weight management

Call 406-243-4712 to make an appointment. For crisis, call the National Suicide Lifeline at 1-800-273-8255, contact the Crisis Text Line: text MT to 741-741, or contact your nearest Emergency Department.

From Curry Health Center Counseling Services:

> We provide a confidential and inclusive environment to address the personal, behavioral, and mental health needs of all UM students. We specialize in addressing the concerns and goals of our diverse UM community. Every student must navigate a wide variety of stressors and challenges during their college career and we're here to offer support as well as assist in getting connected to resources on and off campus. Our licensed counselors, social workers, and psychologists, as well as advanced graduate students, offer individual and group therapy in addition to urgent counseling.

Career Readiness

The College of Forestry and Conservation is committed to the career success of our students and encourages you to participate in ElevateU — UM's signature career readiness program — to ensure that you graduate career-ready, with the education, skills, and tools needed to launch, carry-on, and pivot your post-graduation career. Participation in ElevateU is free and can be started at any time, no matter where you are in your academic or career journey. Suggested ways to get started with ElevateU:

- Create a profile on UM's Handshake platform to search for jobs and internships.
- Schedule an appointment with an Experiential Learning and Career Success (ELCS) career coach or advisor or with a career professional in your college.[3]
- Take the Strong Interest Inventory to explore career and/or major options aligned with your interests.
- Participate in a live group coaching session with industry experts or complete any of 22 career learning journeys within ElevateU Online.
- Find your next opportunity by connecting with employers at a career fair:

---

[3] While all UM students may utilize ELCS's services, students in the following colleges also have access to dedicated career support within their colleges: College of Business, Davidson Honors College, College of Humanities and Sciences, Missoula College.

- Industry and Trades: Careers and Internships Fair, Missoula College, 02/06/23
- Educators' Career Roundtable, ALi Auditorium, 3/14/24
- Hire Griz! Spring Career Fair, UC Ballroom, 03/28/24
- Summer Opportunities Fair, on the Oval, 04/25/24
- Attend events such as employer and alumni panels, salary negotiation workshops, networking events and more. Search and register for ELCS events in Handshake.
- **Put Together the Pieces to Improve Your Interviews** and **Stick the Landing with Applications** through ElevateU Online.

Food and Housing Insecurity

Any student who faces challenges securing food or housing, and believes that this could affect their performance in this course, is urged to contact any or all of the following campuses resources:

ASUM Bear Necessities

Bear Necessities provides support for students living through or on the edge of basic needs insecurity. Through connecting students with badly-needed resources, helping determine priorities and next steps, and providing emotional support, Bear Necessities staff can wade through difficult situations with students so they do not need to go it alone. Poverty can feel like a full-time job! We are here to help students find ways to have their needs met while also protecting their time to succeed in academics and their personal life.

UM Food Pantry

The UM Food Pantry supports UM students facing food insecurity. The pantry is open on Mondays and Wednesdays from 10:30am–3:00pm, Tuesdays and Thursdays from 5:00pm–7:00pm, and Saturdays from 11:00am–3:00pm. The main food pantry is located on the southwest side of the first floor of the University Center, down the hallway adjacent to ASUM. A Grab-N-Go shelf outside the pantry is accessible at all time the University Center is open.

TRiO Student Support Services

TRiO Student Support Services serves UM students who are low-income, first-generation college students or have documented disabilities. TRiO services include a textbook loan program, scholarships and financial aid help, academic advising, coaching, and tutoring. Students can check their eligibility (<www.umt.edu/triosss/apply.php>) for TRiO services online. If you are comfortable, please come see members of the teaching team. We will do our best to help connect you with additional resources.

Legal Support

Students can get free legal advice. To learn more: https://www.umt.edu/asum/agencies/legal/.

SYLLABUS DISCLAIMER

This syllabus is subject to change. We will follow the schedule outlined in this document to the best of our ability, but adjustments may have to be made due to unforeseen factors, including weather. Remaining in the course after reading this syllabus will signify that you accept the possibility of changes and responsibility for being aware of these changes. These changes, should they occur, will be discussed during class periods, and sent out via email.

REFERENCES

Manson, S. M. (Ed.). (2017). *Maps, society, and technology*. University of Minnesota Libraries Publishing. https://open.lib.umn.edu/mapping/