



Field Mapping Techniques

GEOL 353-201/GGS-308-201/GEOL-553-201

George Mason University

Fall 2019

Wednesdays from 1:30pm-2:45pm and Fridays from 1:30pm-5:45pm

Exploratory Hall Room 1309

Prerequisites: 30 credits including MATH 105 or equivalent and GEOG 102 or GEOL 101

Instructors: Lori Mandable

Office: 3417 Exploratory Hall – enter through Forensic Science Dept., 3400 Exploratory Hall

E-mail: lmandabl@masonlive.gmu.edu

Phone: 703-966-5316

Office Hours: Mondays from 12pm-2pm, Wednesdays from 12pm-1:15pm and by appointment

Dr. Julia Nord

Office: 3453 Exploratory Hall

Email: jnord@gmu.edu

Phone: 703-993-3395

Office Hours: by appointment

Required Textbook: None. Selected readings will be given out in class and are considered assigned material. See below for required equipment for class.

Required Field Equipment

- Field Notebook (waterproof)
- Pencils, hardness of at least 2
- Waterproof, thin ink pen – don't spend more than \$15 on this! 😊
- Protractor – 180° is sufficient, but many students prefer a 360° style
- Clipboard with Cover
- **Engineers** Rule (inches) needs to be graduated in 10ths, 20ths, 30ths, 40ths, 50ths, and 60ths.
- Smartphone (iOS or Android platform) – if this is a hardship, please see Prof. Mandable
- Mapping App (Free – we will discuss this in class)
- Calculator (with Trig Functions – most smartphones have this built in)
- Field Boots or Sturdy Shoes & Weather appropriate clothing (layers, rain gear, etc.)
- Sunscreen & Bug Repellent
- Water bottle
- Hat
- Rain Gear - a poncho or jacket is best
- Snacks

Learning Objectives

The objectives of this course are to enable you to make field measurements efficiently, assess the precision and accuracy of these measurements, and convert these data into a contextually appropriate map. By the end of the semester, the goal is to have you feel comfortable with the concepts of field mapping as well as developing the habits of performing field reconnaissance, mission planning, equipment preparation, data collection, data processing and the ability to present/communicate the data as well as its significance within the context of existing research.

Students as Scholars Class

This class is listed as a *Students as Scholars* Inquiry-level course, where students learn about the recursive process of scholarly inquiry through teamwork with weekly projects and a large-scale, original final project. We expect that you will learn content and skills that make you capable of evaluating scholarly work as well as prepare you to conduct your own scholarly research and/or projects in the future. Specifically, in this course you will:

- Articulate scholarly questions related to map products
- Engage in the elements of the scholarly process through research into background context and best methodologies used to produce a map
- Situate the concepts, practices and results of scholarship within a broader context and be able to communicate the importance and value of your projects to others.

For more information on *Students as Scholars* and undergraduate research please go to <http://oscar.gmu.edu/>.

General Information and Policies:

1. Attendance is essential to doing well in this course. Several scientific studies conclusively correlate academic success with regular class attendance. While the instructor does not take attendance for class, the coursework is entirely project and teamwork based, so absences impact both your understanding of the material and potentially that of your teammates. If you must miss a class please let the instructor know ahead of time via email or text message. It is the student's responsibility to meet with the instructor to follow up on any missed material.
2. Graded material is due as designated by the end of the class period. Late submissions of graded material will only be accepted at the discretion of the instructor for **DOCUMENTED** absences and will be penalized one point for every business day after the due date. Missed submissions of graded material receive a grade of 0. It is the student's responsibility to follow up with the instructor regarding a documented extenuating circumstance.
3. Use of electronic devices: Because this is a computer classroom, we will frequently be using the internet as a means to enhance our discussions and perform project work. Please be respectful of your peers and your instructor and do not engage in activities that are unrelated to the class. Such disruptions show a lack of professionalism and you may be asked to leave the classroom.
4. Cell phones: As a courtesy to your classmates, professor and guest speakers, please turn your cell phone off during class lectures. If you are experiencing a medical or family situation where you need to receive an incoming call, please let us know, mute the ring on your phone, and feel free to exit the class to receive your call. Please note, you will need to have access to your cell phone while out in the field as both a safety precaution and a means for your team and instructor to communicate with you.



5. Students must use their MasonLive email account to receive important University information, including communications related to this class. The instructor will not respond to messages sent from or send messages to a non-Mason email address.
See <http://masonlive.gmu.edu> for more information.
6. The instructor will return emails and text messages as quickly as possible Monday through Friday. If you send an email on Saturday or Sunday it could be a full 24-48 hours before the instructor is able to respond.
7. University Policies: The University Catalog, <http://catalog.gmu.edu>, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at <http://universitypolicy.gmu.edu/>. All members of the university community are responsible for knowing and following established policies
8. Inclement Weather and Class Cancellation: GMU posts closings on its website (www.gmu.edu.) You can receive notification from Mason Alerts via email or text to a cell phone; please let the instructor know if you need more information. **Please note: we hold class rain or shine and at any temperature so long as GMU is officially in session, so dress appropriately!**
9. Students of this course must be familiar with the GMU honor code, which can be viewed via this link: <http://www.gmu.edu/catalog/9798/honorcod.html#code>. Three fundamental and rather simple principles to follow at all times are that: (1) all work submitted be your own; (2) when using the work or ideas of others, including fellow students, give full credit through accurate citations; and (3) if you are uncertain about the ground rules on a particular assignment, ask the instructor for clarification. No grade is important enough to justify academic misconduct. Plagiarism means using the exact words, opinions, or factual information from another person without giving the person credit. Writers give credit through accepted documentation styles, such as parenthetical citation, footnotes, or endnotes. Paraphrased material must also be cited, using MLA or APA format. A simple listing of books or articles is not sufficient. Plagiarism is the equivalent of intellectual robbery and cannot be tolerated in the academic setting. If you have any doubts about what constitutes plagiarism, please see the instructor. Any violations of the honor code are taken very seriously and will be reported.
10. Occasional discussions may occur in class. Please be kind and respectful to fellow students. Remember your audience and use proper professional etiquette and language. Review the George Mason Diversity Statement below:

George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth.

An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. Diversity is broadly defined to include such characteristics as, but not limited to, race, ethnicity, gender, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected.



The reflection of Mason's commitment to diversity and inclusion goes beyond policies and procedures to focus on behavior at the individual, group and organizational level. The implementation of this commitment to diversity and inclusion is found in all settings, including individual work units and groups, student organizations and groups, and classroom settings; it is also found with the delivery of services and activities, including, but not limited to, curriculum, teaching, events, advising, research, service, and community outreach.

Acknowledging that the attainment of diversity and inclusion are dynamic and continuous processes, and that the larger societal setting has an evolving socio-cultural understanding of diversity and inclusion, Mason seeks to continuously improve its environment. To this end, the University promotes continuous monitoring and self-assessment regarding diversity. The aim is to incorporate diversity and

inclusion within the philosophies and actions of the individual, group and organization, and to make improvements as needed.

11. Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit <http://ds.gmu.edu/> for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with the instructor. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email: ods@gmu.edu | Phone: (703) 993-2474
12. As a faculty member and designated “Responsible Employee,” the instructor is required to report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s *Title IX Coordinator* per university policy 1412. If you wish to speak with someone confidentially, please contact the *Student Support and Advocacy Center* (703-380-1434) or *Counseling and Psychological Services* (703-993-2380). You may also seek assistance from *Mason’s Title IX Coordinator* (703-993-8730; titleix@gmu.edu).
13. George Mason University offers several student support resources on campus. The following link provides information regarding each of these resources and links to their pages for further information: <https://stearnscenter.gmu.edu/knowledge-center/knowning-mason-students/student-support-resources-on-campus/> and is listed at the end of this syllabus.
14. Failing to complete work or interact with the instructor **will not** result in automatically being dropped or withdrawn from the class. Students are responsible for any changes in enrollment. The grade earned will be reported at the end of the semester for all students enrolled at that time.

Important Fall Semester Dates:

First day of classes	08/26
 Labor Day no classes	09/02
Last day to drop – full refund	09/09
Final drop deadline with no refund	09/17
Student self-withdrawal	09/18-09/30
 Thanksgiving Break	11/24 – 11/30
Last day of classes	12/07

15. This course will consist of 10 projects, 6 math/contour concept packets, 4 check-in assignments and 1 final project consisting of a group paper and presentation. For projects 1-9 and the 6 math/contour concept packets, if students receive a low grade these projects may be repeated and re-submitted. If this is done, they will be re-graded, however, the maximum possible score for repeated labs will be half the difference between the original grade and the maximum possible grade. Original graded work must be re-submitted with the repeated work. **Please note:** This does **NOT** apply to the final project and presentation, **Project 11**. The table below details the coursework planned:

Grading & Grading Rubric

Item	Points
Project 1	15
Project 2	10
Check-In 1	5
Project 3	15
Math 1	5
Math 2	5
Project 4	15
Project 5	15
Math 3	5
Check-In 2	5
Project 6	15
Math 4	10
Project 7	10
Project 8	20
Check-In 3	5
Project 9	20
Math 5	10
Contour Map Worksheets	10
Project 10	20
Check-In 4	5
Project 11 Paper	35
Project 11 Presentation	20
Total	275

Grade	Percentage	Undergrad Points	Graduate Points
A+	97-100%	266.75-275.00	310.40-320.00
A	94-96.99%	258.50-266.74	300.80-310.39
A-	90-93.99%	247.50-258.49	288.00-300.79
B+	87-89.99%	239.25-247.49	278.40-287.99
B	84-86.99%	231.00-239.24	268.80-278.39
B-	80-83.99%	220.00-230.99	256.00-268.79
C+	77-79.99%	211.75-219.99	246.40-255.99
C	74-76.99%	203.50-211.74	236.80-246.39
C-	70-73.99%	192.50-203.49	224.00-236.79
D	60-69.99%	165.00-192.49	192.00-223.99
F	<60%	<165.00	<192.00

16. **Graduate Students** taking GEOL 553 or EVPP 503 will need to do a Graduate Research Project in addition to the Project work assigned as stated above. This Project will need to be original and students will need to meet with Dr. Julia Nord to have the topic approved. This Project will be graded in two parts: a proposal detailing the Project objectives, equipment needed, timeframes, etc. that is worth 15 points and the actual Project with an Executive Summary, Project outline and maps that is worth 30 points. This will make the graduate student total points possible 320 instead of the 275 shown in the chart above for undergraduate students.
17. For each Project, please hand-in the following:
- A short summary of the Project objective
 - A **readable** Xerox copy of your field notes that includes your name, team members, project date(s)/times(s), equipment used (including equipment #), measurements/field work conducted, and sketched (not to scale) map (do NOT prepare a separate copy of your data on a computer - your notes **MUST BE HANDWRITTEN**)
 - A final, drafted copy of the Project map
 - An analysis of the precision and accuracy of your results, and the sources of error inherent in this type of mapping, when noted in the project assignment
 - A reflection on the assignment noting learning outcomes that were achieved, concepts that were mastered and what you would do differently next time – if requested.
18. Projects will be graded on the basis of completeness, accuracy, error analysis, and final presentation. Remember to spell and grammar check all submissions! A rubric will be provided to detail the grading process

for each Project.

19. All students will have ID card access to the GGS Computer Lab located in Exploratory Hall 2102, which has current copies of ArcGIS, a black and white printer and a color laser printer.

20. When working in the field, please adhere to the following:

- **COME PREPARED.** Have the proper equipment, and be sure it is in proper working order. Know beforehand what you are supposed to accomplish, and be familiar with the techniques and equipment involved.
- **WORK IN TEAMS and BE PROFESSIONAL.** Be mindful that the vast majority of work in this class is done in teams and classmates as well as the instructor may not appreciate foul language, snide remarks and inappropriate jokes. If you have a conflict with a team member or instructors, it is best to communicate with that person directly regarding any issues you have in a constructive manner. If necessary, the instructors can aid in the process of constructively resolving issues.
- **WORK SAFELY.** Never work alone, especially in rugged terrain. Always tell someone where you will be, just in case you don't return. Wear proper field clothes. Always keep your wits about you. Remember to drink plenty of fluids and eat!
- **WORK EFFICIENTLY AND BUDGET YOUR TIME.** Develop a way to do your fieldwork in a comfortable, but efficient manner. Keep in mind there is a limited amount of time in which to complete the Project. Leave enough time after fieldwork to prepare the report.
- **PLOT YOUR RESULTS IN THE FIELD.** Get in the habit of collecting data, calculating, compiling, and plotting results while at the field site. This is the most important way to check your work for accuracy. **This may save you from making unnecessary trips back to the field.**

Course Schedule

Week	Date	Topic	Projects/Assign
1	August 28	Course Overview	
	August 30	Maps: Types, Context, Style, Lat/Long, UTM, Projections Topo Maps	Project 1: Maps & Topo Maps DUE: 9/13/2019
2	September 4	Safety & Equipment	Safety Presentation
	September 6	GPS	Project 2: Geocaching Project 2 Due in Class
3	September 11	Mapping Projects Field Notes/Notebooks	
	September 13	Mapping Mason Pond with a GPS/First fieldwork	Project 1 Due Project 3: Mapping Mason Pond DUE: 10/4/2019
4	September 18	Mapping Projects, ArcGIS Trigonometry Overview	
	September 20	Mapping Project: Mason Pond	Continue with Project 3 on ArcGIS
5	September 25	Mapping Apps	
	September 27	Mapping Apps Project	Project 4: Mapping Mason Pond with Selected App DUE 10/11/2019
6	October 2	360° Math/Coordinates Brunton Compasses Check-In 1	Math 1 – Trig Overview DUE: 10/9/2019 Math 2 – 360° Math/Coordinates DUE: 10/9/2019
	October 4	Clocks, Flamingoes & Orienteering, Oh My!	Project 3 Due Project 5: Clocks, Flamingos & Orienteering, Oh My! DUE 10/23/2019
7	October 9	Measurement Precision & Accuracy Bruntons Part II	Math 1 Due Math 2 Due Math 3 – Accuracy & Precision DUE: 10/23/2019
	October 11	Pace & Compass	Project 4 Due Project 6: Pace and Compass in front of Exploratory Hall DUE: 11/1/2019
8	October 16	Triangulation	
	October 18		Project 7: Where is the JC on campus? DUE 11/6/2019
9	October 23	Prep for Manassas	Project 5 Due Math 3 Due
	October 25	Manassas Field Trip	Project 8: Plotting the Cannons at the Battlefield DUE: 11/8/2019
10	October 30	Transits/Differential Leveling Check-In 2	Math 4 - Transits DUE: 11/1/2019
	November 1	Transit of Mason Pond with Transit Equipment	Project 6 Due Math 4 Due Project 9: Transit of Mason Pond DUE: 11/20/2019
11	November 6	Contours & Angles/Making Contour Maps	Project 7 Due Math 5 – Angles Revisited DUE: 11/20/2019

			Contour Map Worksheets Contour Map Worksheets DUE: 12/4/2019
	November 8		Project 8 Due Project 10: Contours of Mason Pond Project 10 DUE: 12/4/2019
12	November 13	GIS Day - Enjoy the Festivities!	
	November 15		Continue with Project 10
13	November 20	Final Project Requirements, Planning Final Project Check-In 3	Math 5 Due Project 9 Due
	November 22	Visit Final Project Field Site	Initial Planning Visit to Final Project Site
	November 23-24	Northern Virginia Mineral Show at GMU (HUB/SUB II Upstairs) Saturday 10am-6pm; Sunday 10am-4pm Free Admission with GMU ID	
14	November 27	Thanksgiving Break – Enjoy the Holidays! ☺	
	November 29		
15	December 4	Field Work Prep/Planning	Contour Map Worksheets Due Project 10 Due ALL REVISIONS TO GRADED WORK DUE Project 11 Paper & Presentation DUE: December 13 at 1:30pm
	December 6-7	Field Trip – Overnight!!!!	Project 11 Field Work
16	December 9 -13	Work on Final Project	Rough Draft of Paper and Map Due at 12pm on Thursday, December 12, 2019 via Blackboard
	Friday, December 13 th at 1:30pm	Final Presentations Check-In 4	Project 11 Presentations and Work Due

Student Support Services:

Assistive Technology Initiative (ATI)

Aquia Building, Room 238 | ati.gmu.edu | ati@gmu.edu | 703-993-4329

Assistive technology assessments, training, and support services for individuals with disabilities.

University Career Services

Student Union Building I (SUB I), 3400 | careers.gmu.edu/ | careers@gmu.edu | 703-993- 2370

A centralized career center that takes an industry-focused approach to serving our students and employers.

Counseling and Psychological Services (CAPS)

Student Union Building 1 (SUB I), Room 3129 | caps.gmu.edu/ | 703-993-2380

Individual and group counseling, workshops, and community education programs designed to enhance students' personal experience and academic performance.

Disability Services (DS)

Student Union Building 1 (SUB I), 2500 | ds.gmu.edu | ods@gmu.edu | 703.993.2474

Promotes equal access for students with disabilities, fosters partnerships, and empower students.

Office of Diversity, Inclusion and Multicultural Education (ODIME)

Student Union Building 1 (SUB I), 2400 | odime.gmu.edu | 703.993.2700

Leads Mason in creating and sustaining inclusive learning environments where all members of the Mason community are welcomed, valued, and supported.

Learning Services

Student Union Building 1 (SUB I), 3129 | learningservices.gmu.edu | 703-993-2999

Experience-based learning opportunities through which students explore a wide range of academic concerns.

Lesbian, Gay, Bisexual, Transgender, Queer and Questioning Resources (LGBTQ)

Student Union Building 1 (SUB I), Room 2200 | lgbtq.gmu.edu/ | 703.993.2702

Promotes the academic success, health and well-being of lesbian, gay, bisexual, transgender, queer, and questioning (LGBTQ) students and their allies.

Office of Military Services

Student Union Building 1 (SUB I), 1510 | admissions.gmu.edu/military/ | 703.993.1316

Assists veterans, active duty service members, guardsmen, reservists, and dependents in making a successful transition into the Mason community.

Office of International Programs and Services (OIPS)

Student Union Building 1 (SUB I), 4300 | oips.gmu.edu | 703.993.2970

Educates, celebrates, and serves Mason community, including international and domestic students, faculty and exchange visitors, by helping them reach their highest academic and personal goals.

Student Health Services

Student Union Building 1 (SUB I), 2300 | shs.gmu.edu | 703.993.2831

Provides high quality health care, counseling, health education and prevention services to George Mason University students.

Student Support and Advocacy Center (SSAC)

Student Union Building 1 (SUB I), Room 3200 | ssac.gmu.edu | 703-993-3686

Offers educational programming, one-on-one consultations, and resources in the areas of interpersonal violence, personal wellness, and alcohol and drug use.