



# OFFICE OF UNDERGRADUATE RESEARCH

## IMMERSIVE RESEARCH INTERNSHIP EXPERIENCE

### Research Internship (FIRE199)

**Term:** Summer 2024 (May 28 - July 19, 2024)

**Section:** 0112

**Professor:** Thanicha Ruangmas

**Pronouns:** she/her/hers

**Office:** Symons 2209

**Email:** ruangmas@umd.edu

**Office Hours:** TBD

**Research Setting:** Symons 2207

**Research Setting Hours:**

Mon & Tue 11am-5pm,

Wed 10am-5pm,

Thu 10am-2pm, 3pm-5pm

### Course Description

Research Internship (FIRE199) is a 3-credit course. The intent of the course is to welcome you into an authentic University of Maryland research group that will provide research training as well as personal and professional development. This course focuses on concepts related to the process of independent research, including collaboration with peers, communication of ideas, troubleshooting unexpected outcomes, and discipline-specific methodologies.

FIRE Sustainability Analytics is a stream that focuses on quantifying the impact of environmental regulation or environmental change on society. Students learn R and develop data science skills to organize, summarize, analyze, and visualize data. They learn how to use reproducible workflows that exemplify best practices in scientific research. As their skills develop, students contribute to an ongoing research topic under the guidance of the Faculty Leader and Faculty Collaborators.

### Learning Outcomes

After successfully completing this course you will be able to:

1. Select and critically evaluate areas of scholarship.
2. Critique, revise, and refine projects.
3. Effectively communicate the application of scholarship through ancillary material.
4. Build collaborative relationships representing diverse cultures, races, ages, genders, religions, lifestyles, and viewpoints to achieve a successful outcome.
5. Demonstrate proficiency in R programming language, specifically for querying, cleaning, and combining data from different sources.
6. Employ reproducible research workflow practices with GitHub.
7. Present an environmental problem or environmental regulation and how it impacts different individuals.

## Required Resources

All course materials will be posted to [ELMS](#).

## Course Structure

For the summer semester of 2024, Sustainability Analytics aims to answer whether light rail openings lead to increased air pollution in specific areas that adversely affect underserved communities. The answer to this question will help predict the air pollution impacts of the Purple Line in Maryland, which is scheduled to open in 2027. Student interns will be divided into four groups, each studying a light rail system in Charlotte, North Carolina, Houston, Texas, Minneapolis-St. Paul, Minnesota, or Phoenix-Mesa, Arizona.

In the first week of the semester, the lab will be closed, and summer interns will learn fundamental or advanced R programming asynchronously. Interns with data cleaning experience in R will learn how to visualize and manipulate spatial data. Interns with no R programming experience will take online courses in DataCamp.

In weeks 2 to 7, each student must spend at least 10 hours each week in the lab and adhere lab schedule set in the first week. Students will work in teams to locate central locations along each light rail route, estimate the change in pollution, and identify affected demographic groups. Students with no experience in R programming will also complete weekly R programming exercises to strengthen their skills. Once research results are found, students will compare their findings and prepare for the Summer Undergraduate Research Conference (SURC). Students will polish and rehearse for their presentation in the last week of the summer internship.

## Policies and Resources for Undergraduate Courses

It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include topics like:

- Academic integrity
- Student and instructor conduct
- Accessibility and accommodations
- Attendance and excused absences
- Grades and appeals
- Copyright and intellectual property

Please visit [www.ugst.umd.edu/courserelatedpolicies.html](http://www.ugst.umd.edu/courserelatedpolicies.html) for the Office of Undergraduate Studies' full list of campus-wide policies and follow up with me if you have questions.

## Course Guidelines

### Names/Pronouns and Self-Identifications:

The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering inclusive and equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to in this class, both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). Keep in mind that the pronouns someone uses are not necessarily indicative of their gender identity. Visit [trans.umd.edu](https://trans.umd.edu) to learn more.

Additionally, it is your choice whether to disclose how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

### Communication with Instructor:

- **Email:** Please email me at [ruangmas@umd.edu](mailto:ruangmas@umd.edu). I will do my best to respond to emails within 24 business hours.
- **ELMS:** I will send IMPORTANT announcements via ELMS. You must make sure that your email & announcement notifications (including changes in assignments and/or due dates) are enabled in ELMS so you do not miss any messages. You are responsible for checking your email and ELMS inbox with regular frequency.

## Assessments

### General Guidelines:

- Student learning will be measured by the assessments listed on the Course Schedule. Additional details on how assessments will be evaluated will be posted to ELMS.
- Assessments must be submitted by the due dates and times posted on ELMS. Assessments submitted late may not be counted for credit.
- Students are responsible for ensuring submitted files are of the correct type, are non-corrupted, and are the intended version of the file. Files that do not fulfill these expectations may not receive credit.
- Students are responsible for their individual contributions to team assessments. Team-based assessments will require communication, collaboration, and iteration to successfully complete.

## Final Grade Cutoffs:

Grade	Cutoff	Grade	Cutoff	Grade	Cutoff	Grade	Cutoff	Grade	Cutoff
A+	97%	B+	87%	C+	77%	D+	67%	F	<60%
A	93%	B	83%	C	73%	D	63%		
A-	90%	B-	80%	C-	70%	D-	60%		

- Final grades will be rounded to the nearest number. For example, a final grade of 89.5% will be rounded up to 90% (A-) and a final course grade of 89.4% will remain 89% (B+).

## Grading Structure:

Name	% of grade
ASN 1: Weekly Report [Individual]	35
ASN 2: DataCamp/Terra Training [Individual]	5
ASN 3: Paper Replication/GitHub Markdown Report [Team]	10
ASN 4: Resume Draft [Individual]	5
ASN 5: Final Resume [Individual]	5
ASN 7: Research Product Draft [Team]	10
ASN 8: Final Research Product [Team]	30

All assessment scores will be posted on the course ELMS page. If you would like to review any of your grades or have questions about how something was scored, please email me to schedule a time for us to meet and discuss.

## Assessment Descriptions:

ASN	Description	Learning Outcome(s)
1	Students will complete a progress report each week. The progress report in Week 1 is a survey. In weeks 2 through 7, students will share their effort hours and weekly reflections in a spreadsheet. Each week's progress report is weighted equally.	2, 3
2	Students new to R programming will complete the following exercises in DataCamp: Intro to Basics, Vectors, Data Frames, Data Wrangling, and Data Visualization. Students familiar with R programming will follow tutorials in Spatial Data Science, specifically the chapter Spatial Data with terra.	5, 6
3	Students new to R programming will work in a team to use R programming to replicate figures and papers from a published paper. The two assignments in this group are: <ul style="list-style-type: none"> <li>• ASN3A.1. Understanding the Data (5%)</li> <li>• ASN3A.2. Paper Replication: Make Figure 1 (5%)</li> </ul> Students familiar with R programming will review and compile your team's research progress on a GitHub Markdown page. The two assignments in this group are: <ul style="list-style-type: none"> <li>• ASN3B.1. Week 3 Team Report (5%)</li> <li>• ASN3B.2. Week 5 Team Report (5%)</li> </ul>	1, 2, 3, 4, 5, 6
4	Students will draft their resumes in Google Docs or LaTeX format, highlighting their experience with FIRE.	2, 3
5	Students will incorporate feedback to revise their resumes.	2, 3
6	Students will compile their results and create presentation materials for the Summer Undergraduate Research Conference (SURC).	1, 2, 3, 7
7	Students will incorporate feedback and produce professional presentation materials for the Summer Undergraduate Research Conference (SURC).	1, 2, 3, 7

## Academic Integrity






For this course, some of your assignments will be collected via Turnitin on our course ELMS page. I have chosen to use this tool because it can help you improve your scholarly writing and help me verify the integrity of student work. For information about Turnitin, how it works, and the feedback reports you may have access to, visit [Turnitin Originality Checker for Students](#).

The University's Code of Academic Integrity is designed to ensure that the principles of academic honesty and integrity are upheld. In accordance with this code, the University of Maryland does not tolerate academic dishonesty. Please ensure that you fully understand this code and its implications because all acts of academic dishonesty will be dealt with in accordance with the provisions of this code. All students are expected to adhere to this Code. It is your responsibility to read it and know what it says, so you can start your professional life on the right path. **As future professionals, your commitment to high ethical standards and honesty begins with your time at the University of Maryland.**

It is important to note that course assistance websites, such as CourseHero, or AI-generated content are not permitted sources unless the instructor explicitly gives permission. Material taken or copied from these sites can be deemed unauthorized material and a violation of academic integrity. These sites offer information that might be inaccurate or biased and most importantly, relying on restricted sources will hamper your learning process, particularly the critical thinking steps necessary for college-level assignments.

Additionally, students may naturally choose to use online forums for course-wide discussions (e.g., Group lists or chats) to discuss concepts in the course. However, collaboration on graded assignments is strictly prohibited unless otherwise stated. Examples of prohibited collaboration include: asking classmates for answers on assignments, asking for access codes to clicker polls, etc. Please visit the [Office of Undergraduate Studies' full list of campus-wide policies](#) and reach out if you have questions.

***If you are ever unclear*** about acceptable levels of collaboration, ***please ask!*** To help you avoid unintentional violations, ***the following table*** lists levels of collaboration that are acceptable for each graded exercise. Each assignment will contain more specific information regarding acceptable levels of collaboration.

Assessment	 <b>OPEN NOTES</b>	 <b>LEARN ONLINE</b>	 <b>GATHER CONTENT With AI</b>	 <b>ASK FRIENDS</b>	 <b>WORK IN GROUPS</b>
ASN1. Weekly Report	✓	—	—	—	—
ASN2. DataCamp/Terra Training	—	✓	—	—	—
ASN3. Paper Replication/Team Report	✓	—	—	✓	✓
ASN4. Resume Draft	✓	—	✓	✓	—
ASN5. Final Resume	✓	—	✓	✓	—
ASN 6. Research Product Draft	✓	—	✓	✓	✓
ASN 7. Final Research Product	✓	—	✓	✓	✓

## Course Outline

Week #	Week of	Course Activities	ASN(s) Due
1	5/28	<ul style="list-style-type: none"> <li>Complete assignments asynchronously.</li> <li>The lab will be closed.</li> </ul>	ASN 1. Weekly Report ASN2. DataCamp/Terra Training
2	6/3	<ul style="list-style-type: none"> <li>Form teams and form an understanding of the research context.</li> <li>Work on ASN3.1. Paper Replication/Team Report.</li> </ul>	ASN1. Weekly Report
3	6/10	<ul style="list-style-type: none"> <li>Query and clean data from NASA Earth Data.</li> <li>Work on ASN3.1. Paper Replication/Team Report.</li> </ul>	ASN1. Weekly Report ASN3.1. Paper Replication/Team Report
4	6/17	<ul style="list-style-type: none"> <li>Run models and form preliminary conclusions.</li> <li>Work on ASN3.2. Paper Replication/Team Report.</li> </ul>	ASN1. Weekly Report
5	6/24	<ul style="list-style-type: none"> <li>Query and clean census data.</li> <li>Work on ASN3.2. Paper Replication/Team Report.</li> </ul>	ASN1. Weekly Report ASN3.2. Paper Replication/Team Report
6	7/1	<ul style="list-style-type: none"> <li>Merge census data with previous results.</li> <li>Draft a resume.</li> </ul>	ASN1. Weekly Report ASN4. Resume Draft
7	7/8	<ul style="list-style-type: none"> <li>Compile results and draft a research product.</li> </ul>	ASN1. Weekly Report ASN6. Research Product Draft
8	7/15	<ul style="list-style-type: none"> <li>Polish research product and presentation.</li> <li>Give a presentation at the Summer Undergraduate Research Conference (SURC).</li> </ul>	ASN5. Final Resume ASN7. Final Research Product

- **The semester ends on Friday, July 19 at 5 PM. No late assignments will be accepted past this date.**
- **This course does not have a final exam.**

Note: This is a tentative schedule, and subject to change as necessary – monitor the course ELMS page for current deadlines. In the unlikely event of a prolonged university closing, or an extended absence from the university, adjustments to the course schedule, deadlines, and assignments will be made based on the duration of the closing and the specific dates missed.



## Resources & Accommodations

### Accessibility and Disability Services:

The University of Maryland is committed to creating and maintaining a welcoming and inclusive educational, working, and living environment for people of all abilities. The University of Maryland is also committed to the principle that no qualified individual with a disability shall, on the basis of disability, be excluded from participation in or be denied the benefits of the services, programs, or activities of the University, or be subjected to discrimination. The [Accessibility & Disability Service \(ADS\)](#) provides reasonable accommodations to qualified individuals to provide equal access to services, programs, and activities. ADS cannot assist retroactively, so it is generally best to request accommodations several weeks before the semester begins or as soon as a disability becomes known. Any student who needs accommodations should contact me as soon as possible so that I have sufficient time to make arrangements.

For assistance in obtaining an accommodation, contact Accessibility and Disability Service at 301-314-7682, or email them at [adsfrontdesk@umd.edu](mailto:adsfrontdesk@umd.edu). Information about [sharing your accommodations with instructors](#), [note taking assistance](#), and more is available from the [Accessibility and Disability Service](#).

### Student Resources and Services:

Taking personal responsibility for your own learning means acknowledging when your performance does not match your goals and doing something about it. I hope you will come to talk to me so that I can help you find the right approach to success in this course, and I encourage you to visit [UMD's Student Academic Support Services website](#) to learn more about the wide range of campus resources available to you.

In particular, everyone can use some help sharpening their communication skills (and improving their grade) by visiting [UMD's Writing Center](#) and scheduling an appointment with the campus Writing Center.

You should also know there are a wide range of resources to support you with whatever you might need ([UMD's Student Resources and Services website](#) may help). If you feel it would be helpful to have someone to talk to, visit [UMD's Counseling Center](#) or [one of the many other mental health resources on campus](#).

### Notice of Mandatory Reporting:

Notice of mandatory reporting of sexual assault, sexual harassment, interpersonal violence, and stalking: As a faculty member, I am designated as a "Responsible University Employee," and I must report all disclosures of sexual assault, sexual harassment, interpersonal violence, and stalking to UMD's Title IX Coordinator per University Policy on Sexual Harassment and Other Sexual Misconduct.

If you wish to speak with someone confidentially, please contact one of UMD's confidential resources, such as [CARE to Stop Violence](#) (located on the Ground Floor of the Health Center) at 301-741-3442 or the [Counseling Center](#) (located at the Shoemaker Building) at 301-314-7651.

You may also seek assistance or supportive measures from UMD's Title IX Coordinator, Angela Nastase, by calling 301-405-1142, or emailing [titleIXcoordinator@umd.edu](mailto:titleIXcoordinator@umd.edu).

To view further information on the above, please visit the [Office of Civil Rights and Sexual Misconduct's](#) website.

### **Basic Needs Security:**

If you have difficulty affording groceries or accessing sufficient food to eat every day, or lack a safe and stable place to live, please visit [UMD's Division of Student Affairs website](#) for information about resources the campus offers you and let me know if I can help in any way.

### **Veteran Resources:**

UMD provides some additional support to our student veterans. You can access those resources at the office of [Veteran Student Life](#) and the [Counseling Center](#). Veterans and active duty military personnel with special circumstances (e.g., upcoming deployments, drill requirements, disabilities) are welcome and encouraged to communicate these to me in advance, if possible.

## **Course Evaluation**

Please submit a course evaluation through Student Feedback on Course Experiences in order to help faculty and administrators improve teaching and learning at Maryland. All information submitted to Course Experiences is confidential. Campus will notify you when Student Feedback on Course Experiences is open for you to complete your evaluations at the end of the semester. Please go directly to the [Student Feedback on Course Experiences](#) to complete your evaluations. By completing all of your evaluations each semester, you will have the privilege of accessing through Testudo the evaluation reports for the thousands of courses for which 70% or more students submitted their evaluations.

## **Copyright Notice**

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