FIRE: THE FIRST-YEAR INNOVATION & RESEARCH EXPERIENCE

SUSTAINABILITY ANALYTICS

FIRE Semester 2 (FIRE198)

Term: Spring 2024
Section: 0112
Professor: Thanicha Ruangmas
Pronouns: she/her/hers
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Office Hours: TBD
Classroom: ATL2339
Class Meeting Time: Tue 11:00 am - 11:50 am
Lab: Symons 2207
Lab Hours: TBD

Course Description

FIRE Semester 2 (FIRE198) is a 2-credit course. It is the **second** in the sequence of **three** courses you will complete with the FIRE program. Through this course, you will be welcomed into your stream's discipline, receive training in authentic research methods, and begin to take ownership of part of the stream's research agenda as part of your development toward fearless career readiness.

FIRE Sustainability Analytics is a research stream that focuses on research in empirical environmental economics. We strive to understand the socioeconomic consequences of climate change and environmental regulations. We conduct impact assessments using methodology from economics, data science, and environmental studies. Students learn R and develop data science skills used to organize, summarize, analyze and visualize data. They learn how to use reproducible workflows that exemplify best practices in scientific research. At the same time, students learn what questions have been addressed in the field of environmental economics so that they can eventually ask new questions. As their skills develop, students contribute to a new or ongoing research topic under the guidance of Peer Research Mentors, the Faculty Leader, and Faculty Collaborators.

Learning Outcomes

After successfully completing this course you will be able to:

1. Demonstrate proficiency in R programming language, specifically for querying, cleaning, and combining data from different sources.
2. Employ reproducible research workflow practices with Posit Cloud and GitHub.
3. Present an environmental problem of the student's choice and how the problem impacts different individuals in society.
4. Present an environmental regulation and its intended and unintended consequences.
5. Break down and critique existing environmental economics research papers.
6. Build collaborative relationships representing diverse cultures, races, ages, genders, religions, lifestyles, and viewpoints.

Peer Research Mentors

Peer Research Mentors are experienced FIRE students who are experts on the stream's research and are dedicated to helping you.

Peer Research Mentor	Email Address
Defne	defned@terpmail.umd.edu
Tyler	tjones77@terpmail.umd.edu
Luke	lmorell1@terpmail.umd.edu
Lasya	muthyam@terpmail.umd.edu
Sriya	speddint@terpmail.umd.edu
William	wratnava@terpmail.umd.edu
Vai	vsriv81@terpmail.umd.edu
Landon	landonct@umd.edu

Required Resources

All course materials will be posted to ELMS.

Course Structure

The first half of the course integrates three learning environments each week: a self-paced online course, a 50-minute classroom session led by the Faculty Leader, and a lab session led by PRMs. Each week, students learn basic programming functions in R by completing assigned online tutorials in DataCamp. In each classroom session, the Faculty Leader discusses weekly plans and teaches additional programming skills to supplement the self-paced online course. Students then apply skills from the DataCamp chapters to transform publicly available data to replicate the data structure, figures, or tables in a published paper by Deschênes et al. (2017).

At the same time, students have to learn what questions have been addressed in the field of environmental economics so that they can eventually ask and answer new questions. To learn about the forefront of environmental economics research, students take turns reviewing working papers at the beginning of each week's classroom session.

In the second half of the course, students combine their interest and understanding of research in environmental economics to propose new research questions. Students form teams with other students with similar research interests and availability. Each team meets in the classroom and in the lab to compile annotated bibliographies to justify their questions' novelty and identify data sets that justify the questions' feasibility. At the end of the semester, each team will present their project's prospectus to Faculty Collaborators.

Support

FIRE has developed guidelines and assembled resources to help support both your life as a student and your technological success in this course. For more information, please visit the FIRE Student Support page on our website.

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 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 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. 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
A+	97%
A	93%
A-	90%
B+	87%
B	83%
B-	80%
C+	77%
C	73%
C-	70%
D+	67%
D	63%
D-	60%
F	<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
ASN1. Class Survey	2
ASN2. DataCamp Exercises	10
ASN3. Literature Review Presentation [Team]	10
ASN4. Lab Consultations	10
ASN5. Paper Replication	10
ASN6. Formative Assessment	10
ASN7. Proposal Development [Team]	43
ASN8.1. Career Readiness: Reporting	2.5
ASN8.2. Career Readiness: Reflection	2.5

Each assessment may consist of multiple assignments throughout the semester. More information on 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	Each student will complete a survey to share your research background, interests, and availability.	6
2	Each student will complete exercises in assigned DataCamp chapters to understand basic R programming functions. The five assignments in this group and their approximate percentage of the total score are: ● ASN2.1. DataCamp: Intro to Basics (1.25%) ● ASN2.2. DataCamp: Vectors,Data frames (2.5%) ● ASN2.3. DataCamp: Data Wrangling, Data Visualization (2.5%) ● ASN2.4. DataCamp: Grouping and summarizing, Types of visualizations (2.5%) ● ASN2.5. DataCamp: Joining Multiple data.tables (1.25%)	1

ASN	Description	Learning Outcome(s)
3	Each team of students will choose a forefront environmental economics paper and discuss it in class. The two assignments in this group and their approximate percentage of the total score are: ● ASN3.1. Literature Review Slides (4%) ● ASN3.2. Literature Review Presentation (6%)	3, 4, 5, 6
4	Each student will go to the lab to complete paper replication exercises with PRMs and collaborate on team projects. There are nine weeks where lab attendance is required. Each week's attendance is weighted equally. Each student gets one unexcused absence.	1, 2, 6
5	Each student will use R programming and reproducible research workflow practices to replicate figures and papers from a published paper. The three assignments in this group and their approximate percentage of the total score are: ● ASN5.1. Understanding the Data (3%) ● ASN5.2. Paper Replication: Make Figure 1 (4%) ● ASN5.3. Paper Replication: Make Table 1 (3%)	1, 2
6	Each student will apply their programming skills to answer a question about a given data set and be evaluated by a PRM.	1, 2
7	Each team of students will form a research question, identify its novelty by reviewing existing literature, identify its feasibility by conducting basic data analysis, and present their prospectus to Faculty Collaborators. The six assignments in this group and their approximate percentage of the total score are: ● ASN7.1. Form a Question (3.7%) ● ASN7.2. Identify Key Literature (3.7%) ● ASN7.3. Breakdown and Critique Existing Literature and Data (7.5%) ● ASN7.4. Research Proposal Draft (7.5%) ● ASN7.5. GitHub-Flavored Markdown Page with Summary Statistics (7.5%) ● ASN7.6. Research Proposal Presentation (3.7%) ● ASN7.7. Final Proposal (9.4%)	ALL
8.1.	Each student will complete a short survey reporting on goals for joining FIRE and measuring progress on Career Readiness.	ALL
8.2.	Each student will reflect on their experiences and accomplishments in FIRE Semester 2.	ALL

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	OPEN NOTES	LEARN ONLINE	GATHER CONTENT With AI	ASK FRIENDS	WORK IN GROUPS
ASN1. Class Survey	✔	—	—	—	—
ASN2. DataCamp Exercises	✔	✔	—	✔	—
ASN3. Literature Review Presentation [Team]	✔	✔	✔	✔	✔
ASN4. Lab Consultations	✔	—	—	✔	✔
ASN5. Paper Replication	✔	—	✔	✔	✔
ASN6. Formative Assessment	✔	—	✔	✔	✔
ASN7. Proposal Development [Team]	✔	✔	✔	✔	✔
ASN8. Career Readiness: Reporting & Reflection	✔	—	—	—	—

Course Outline

Unless otherwise noted, assignments are due before the start of our regularly scheduled class time.

Week #	Week of	Course Activities	ASN(s) Due
1	1/24	No class	NONE
2	1/29	Introduce the stream and spring semester Choose a paper for ASN3. Literature Review Presentation and form teams	ASN1. Class Survey
3	2/5	Work on ASN3. Literature Review Presentation	ASN2.1. DataCamp Exercise: Intro to Basics
4	2/12	ASN3. Literature Review Presentation for Teams 1-3 Introduce Posit Cloud and GitHub GUI	ASN2.2. DataCamp Exercises: Vectors,Data frames
5	2/19	ASN3. Literature Review Presentation for Teams 4-5 Introduce packages in R	ASN2.3. DataCamp Exercises: Data Wrangling, Data Visualization ASN4.1. Lab Consultation
6	2/26	ASN3. Literature Review Presentation for Teams 6-8 Review types of data	ASN2.4. DataCamp Exercises: Grouping and Summarizing, Types of Visualizations ASN4.2. Lab Consultation ASN5.1. Paper Replication: Understanding the Data
7	3/4	ASN3. Literature Review Presentation for Teams 9-10 Introduce data structures	ASN2.4. DataCamp Exercises: Joining Multiple data.tables ASN4.3. Lab Consultation ASN5.2. Paper Replication: Make Figure 1

Week #	Week of	Course Activities	ASN(s) Due
8	3/11	ASN3. Literature Review Presentation for Teams 11-13 Introduce ASN6. Formative Assessment	ASN4.4. Lab Consultation ASN5.3. Paper Replication: Make Table 1 ASN7.1. Proposal Development: Form a Question
9	3/18	**Enjoy your Spring Break!**	**NONE**
10	3/25	Discuss collaboration practices with GitHub	ASN6. Formative Assessment
11	4/1	Review and improve ASN7.2. Identify Key Literature	ASN7.2. Identify Key Literature
12	4/8	Review and improve ASN7.3. Breakdown and Critique Existing Literature and Data	ASN4.5. Lab Consultation ASN7.3. Breakdown and Critique Existing Literature and Data
13	4/15	Query and merge data	ASN4.6. Lab Consultation ASN7.4. Proposal Draft
14	4/22	Discuss how to make summary statistics tables and GitHub-Flavored Markdown (GFM) Pages	ASN4.7. Lab Consultation
15	4/29	Review and improve ASN7.4. and ASN7.5.	ASN4.8. Lab Consultation ASN7.5. GFM Page with Summary Statistics
16	5/6	In-class ASN7.6. Research Proposal Presentation to Faculty Collaborators	ASN4.9. Lab Consultation Due 5/9 at 5 pm: ASN7.7. Final Proposal ASN8. Career Readiness: Reporting & Reflection

- **The semester ends on Thursday, May 9 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. 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.

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.

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