



FIRE

# THE FIRST-YEAR INNOVATION & RESEARCH EXPERIENCE

**SUSTAINABILITY ANALYTICS**

## **FIRE 151 - FIRE SEMESTER 2: Sustainability Analytics**

Class: ITV 1111  
Time: Monday, 10:00am – 10:50am

Instructor: Ian Page  
Office: Symons Hall, Room 2209  
Email: [ibpage@umd.edu](mailto:ibpage@umd.edu)  
Office Hours: Monday & Thursday, 1pm – 2pm; and by appointment

Research Lab: Symons Hall, Room 2207  
Stream Website: [www.arec.umd.edu/fire](http://www.arec.umd.edu/fire)

### **Course Description**

This is the second course in the FIRE program sequence and is for students participating in the Sustainability Analytics innovation and research stream. This course will focus on concepts related to the process of independent research, including collaboration with peers, communication of ideas, troubleshooting unexpected outcomes, and analytic techniques specific to economics. Scheduled class meetings will focus on the discussion of primary literature, managing research issues, and continual review of individual and group research progress. The course requires each student to commit to 6 additional hours of independent research per week.

Sustainability Analytics is a collaborative research engagement with faculty from the Department of Agricultural and Resource Economics. Our work will focus on quantitative analysis related to resource, environmental, and energy sustainability. Research methods involve examination of how species characteristics, ecosystems, markets, technology, and trade influence the conservation or overexploitation of natural resources. Additional areas of interest include analysis of adoption trends of renewable energy technologies and interventions to encourage households and small businesses to invest in cost-effective, energy-saving technologies.

## **Course Organization**

Students will work both individually and in small groups on projects related to the continually evolving research agenda of the stream. We will begin the semester by familiarizing ourselves with all of the research topics within Sustainability Analytics and building a universal skillset for the stream. Students will later be assigned to specific research projects and will receive further training and guidance as needed.

Students will build expertise in the following areas:

1. Review of primary literature and discipline understanding
2. Collaboration and discussion of data
3. Practical methodological experience
4. Record keeping and professional writing

### 1. Review of primary literature and discipline understanding:

Students will gain experience researching the background of a topic within Sustainability Analytics. This will include understanding the proper methods required to approach a question, what has been done already within the field, and what questions still remain. Through analysis of published articles, students will gain an understanding of the expected format and tone of discipline-specific research articles, which will prepare them for the production a manuscript presenting the findings of their own research. Aggregate guided review of contemporary literature will facilitate broad understanding of the discipline engaged.

### 2. Collaboration and discussion of data:

Working within the framework of small groups and the stream, students will learn to discuss data, troubleshoot problems encountered during the course of their work, and otherwise gain confidence and capacity with the collaborative nature of research.

### 3. Practical methodological experience:

Students will be responsible for conducting research and will be trained in the theoretical background and practical execution of basic methodological techniques needed to further the research goals of the stream.

### 4. Record keeping and professional writing:

The maintenance of proper records is critical for research credibility and experimental reproducibility, thus students will be responsible for maintaining a log of their research procedures and data. Students will also prepare a final written manuscript in the form of a Research Report to outline their specific studies. Data may be collected and prepared for publication, dependent on results.

## Required Texts

Students will review academic articles related to the research being conducted, which will be provided through ELMS.

## Attendance

Due to the nature of research, students will be required to work in the dedicated Sustainability Analytics research center for 6 hours each week in addition to scheduled weekly class meetings. Students will be required to sign in and out to ensure that research hours are correctly noted.

University sanctioned absences for scheduled class time will be excused, however, the Research Educator must be notified prior to the absence. Additionally, absences due to illness require a medical excuse.

## Evaluation

Evaluation of student progress will be based on participation in discussions and evidence of work rather than research results. All assignments will be assessed based on whether they meet (**M**) the expectations set forth in the rubric or are incomplete (**I**).

- **Weekly Meeting Participation** – Students will attend a weekly meeting to allow for group discussion of student progress, troubleshooting research issues, and to review results. Students will be evaluated based on whether they have attended meetings and participated during discussion.

**M**: Student attended and contributed to discussions for at least 12 meetings;

**I**: Student attended and contributed to discussions for fewer than 12 meetings

- **Informal Progress Reports\*** – Every student will be required to deliver ~2 informal progress reports over the course of the semester. Presentations are assessed based on three points: content (1), clear communication (1), and ability to answer questions (1).

**M**: 3 points; **I**: Fewer than 3 points

- **Literature Analyses\*** – There will be ~2 discussed scholarly papers over the course of the semester. Students should prepare a write-up of each paper, including a brief summary of the background (1), methods used (1), and conclusions (1) of each article to be reviewed during the weekly meeting.

**M**: 3 or more points; **I**: Fewer than 3 points

- **Sustainable Events** – Every semester the university hosts a number of workshops, discussions, and presentations related to sustainability. Students can either attend an event from a list provided by the Research Educator or attend an alternate event with prior approval. After attending the event, students are expected to submit a summary (1-2 paragraphs) of what they learned.

**M:** Summary demonstrates an understanding of the information from the presentation;  
**I:** absence of submission or summary does not convey the main points from the event

- **Research Center Attendance** – Students are required to work in the research lab about 6 hours each week. Students must sign in and out with the Research Educator to ensure their hours are counted.

**M:** at least 72 hours recorded; **I:** Fewer than 72 hours

- **Methods and Skills\*** – Students will be assigned several training modules throughout the semester, each of which will prepare the students for various aspects of research relevant to the stream. Completion of each module will lead to files that students can submit to the Research Educator for evaluation.

**M:** file output proving the students have successfully completed the module;  
**I:** absence of file or incorrect file output

- **Research Report Draft Sections** – Drafts of each of the sections of the student's final research report will be submitted over the course of the semester. Students will receive feedback on how to improve their drafts for the final research report.

**M:** submitted draft requires no more than moderate revisions;  
**I:** no draft submitted or submission requires major revisions

- **Final Research Report** – The final research report will be an aggregation and refinement of draft sections developed throughout the semester. Reports will be assessed on four points: spelling and grammar (1), cohesive formatting (1), content (1), and completeness (1).

**M:** 3 or more points; **I:** Fewer than 3 points

\*A cumulative grade will be assigned for multiple evaluations. The cumulative score for assignments that have multiple evaluations will be the majority score of individual evaluations with the higher score awarded in the event of a majority-score tie

#	Assignment	Course Objective	M	I
1	Weekly Meeting Participation	The student attends and participates during the meetings, contributing to research discussion.		
2	Informal Progress Reports	The student is able to relate the progress of his/her research verbally to the rest of the class in an informal setting in order to receive feedback and suggestions.		
3	Literature Analyses	The student is able to discover and analyze the available scientific literature to determine relevant information for his/her final research report.		
4	Sustainable Events	The student attended at least one sustainability-related event this semester and submitted a write-up summarizing the presentation.		
5	Research Setting Attendance	The student can work independently within the research setting for a require minimum of 6 hours a week in order to work toward the goals of his/her research project.		
6	Methods and Skills	The student is capable of working independently in the lab with a basic understanding of the methods, both practical and theoretical, being utilized for the research project.		
7	Draft Report Part 1 – Introduction	The student can author an introduction to his/her research report containing background information to introduce the research topic and explain the purpose of the current research.		
8	Draft Report Part 2 – Methods	The student can author a methods section relating the proper information to duplicate experiments utilized during his/her research.		
9	Draft Report Part 3 – Results	The student can author a results section, including figures to illustrate and descriptions of the research results obtained.		
10	Draft Report Part 4 – Discussion	The student can author a discussion section, including an analysis of the current work, alternative theories, and future directions.		
11	Research Report	The student can combine the draft sections of the research report into a cohesive document outlining his/her research and experience over the course of the semester.		

The following grade scale will be used to assign final grades based on number of assignments earning an M or I designation for the 11 total assignments.

	<b>Meets (M)</b>	<b>Incomplete (I)</b>
A	11	0
A-	10	1
B+	9	2
B	8	3
B-	7	4
C+	6	5
C	5	6
C-	4	7
D+	3	8
D	2	9
F	1	10

### **Research Setting Policies**

The following policies are strictly enforced within the research center:

- Be respectful. This includes but is not limited to:
  - Listening to instructions from the Research Educator and/or fellow researchers
  - Behaving civilly to those in research setting
  - Keeping conversation to a volume so as not to disturb others that are working
- Headphones are allowed during periods of independent work, so long as instructions can still be followed and the music is not disruptive to others.
- All efforts to troubleshoot should be made amongst fellow group members and the class as a whole before the instructor becomes involved.

### **Class Cancellations and Emergencies**

All assignments are due before the beginning of the weekly meeting and are submitted online, therefore assignments will still be due even in the event of a university cancellation. In the event of an emergency, follow all UMD announcements, guidelines and policies. Class will not be held when the university is closed due to emergency, weather, or other unforeseen event. Any other cancellations will be communicated through ELMS.

### **Academic Integrity**

The University of Maryland, College Park Code of Academic Integrity is strictly enforced in this class. Assignments and classwork must reflect your own original work and must include proper citation and attribution for work that is not your own. Academic dishonesty includes:

- “Cheating: Intentionally using or attempting to use unauthorized materials, information, or study aids in any academic exercise.
- Fabrication: Intentional and unauthorized falsification or invention of any information or citation in an academic exercise
- Facilitating academic dishonesty: Intentionally or knowingly helping or attempting to help another to violate any provision of this Code
- Plagiarism: Intentionally or knowingly representing the words or ideas of another as one’s own in any academic exercise.”

For information concerning the Code of Academic Integrity see:

<http://www.shc.umd.edu/SHC/Default.aspx>

### **Academic Accommodations**

If you require academic accommodation, please provide proper documentation by the second class period and contact Disability Support Services so that we can arrange an appropriate accommodation for your needs.

DSS Phone: (301) 314-7682

DSS Web: <http://www.counseling.umd.edu/DSS/>