

Welcome to CS 110
Research Methods in Computer Science
for the
Early Research Scholars Program (ERSP)

Ziad Matni, Ph.D.

Fall 2023

ACKNOWLEDGEMENTS:

Big thank you to Prof. Diba Mirza for starting this program and giving us this excellent framework at UCSB, which, in turn, is based on the ERSP at UC San Diego developed by Prof. Christine Alvarado in the Department of Computer Science and Engineering.

Your Instructor



Ziad Matni, Ph.D.

Email:

ziad.matni@ucsb.edu

Office hours:

Tuesdays, 1:30 – 3:00 PM, or by appointment

Office:

HFH 1123

Your Graduate and Peer Course Mentors

Thomas Schibler (TA)

Email: *tschibler@ucsb.edu*

Office hours: **Mondays, 2-4 PM** (starting Week 2)

Ryan He (ULA)

Email: *ryanhe@ucsb.edu*

Office hours: **Thursdays, 1-3 PM**

Where is Everything?



MAIN WEBSITE – SCHEDULE

<https://ersp.cs.ucsb.edu/cs110-research-methods-computer-science>

MAIN WEBSITE – SYLLABUS:

<https://ersp.cs.ucsb.edu/syllabus>

HOMEWORK SUBMISSIONS: Gradescope

<https://www.gradescope.com/>

LOGS & All Other Research-Related Work: Google Drive

<https://drive.google.com>

Communication Channels: Slack

How to Contact Us?!

If you have a question – the best way is to:

Ask us in class! 😊

Or during our office hours!

Otherwise:

Please use Slack for all communication

- Good for public, mass messages AND also private direct messages

If you *need to* email Prof. Matni for private/personal matters, you can do so

You!



**Let's Take Attendance
and
Get to Know You!!!**

High Level Course Goals

This is a course designed to introduce you to the world of academic research in Computer Science

- And Scientific Research in general

You will learn the answers to *cool and important questions* like:

- “*what is this topic about?*” (deep-diving into a subject matter)
- “*how do I do XYZ?*” (methodology)
- “*why/who cares about this stuff?*” (bigger-picture/philosophy of science)
- “*how should I behave?*” (professionalism and ethics)

More Detailed Course Goals

In this course (and over the next 3 quarters) you will learn how to...

- Identify and formulate **research questions**
- Read **research papers**
- Work effectively in a **team**
- Perform a **literature search**
- Engage in **self-guided learning**
- **Design research studies**
- Perform **data analysis**
- Perform **effective time management, goal setting** and **activity logging**
- **Communicate** about research, both orally and in written form

The Trifecta of Success in this Class!



Remember:

ERSP is a **Community!**

We strive to be an inclusive community!

**Keep Up with the
Work**

**Do not miss your
Group Meetings,
Meetings with
Mentors**

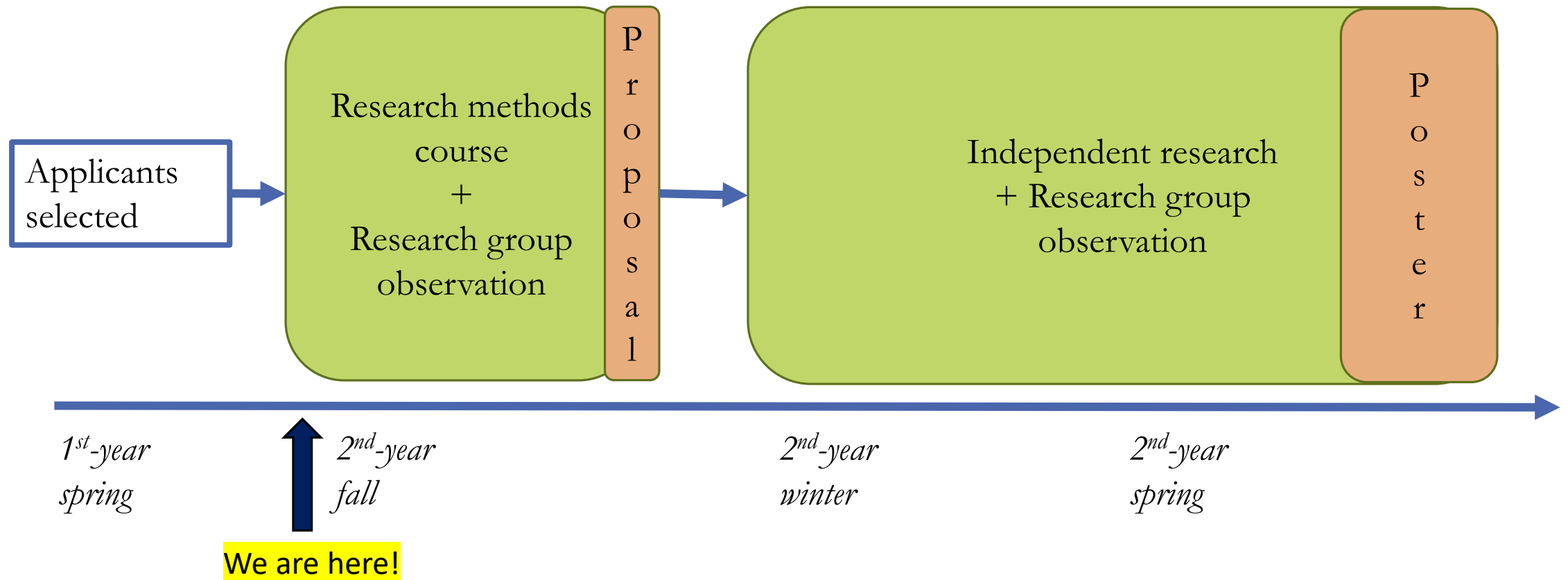
**PULL YOUR OWN
WEIGHT!**

Attend Your Classes

**Prof's, TAs', ULAs'
Office Hours**

Help through Slack

ERSP: Program Overview



Structure of CS 110

Your grade in CS110 will be based on

- **HW assignments** (due before each lecture)
- **Participation activities** (done in-class)
- **Logs** (due weekly)
- Research Group Meeting **Attendance**
- Research Group **Contribution**
- **Project proposal** (a lengthy paper)
- **Final presentation**

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Homework Assignments


Topic by week	Day	Pre-class Assignments (due by class time on the day it is listed)	In-class topic/activity
Week 1 Introduction to research and teamwork	Mon	Read the syllabus (the big button on top of this page!) Complete the project poll assignment, if you haven't already.	Introduction to CS110, ERSP, and research (slides). Template of in-class activities Project group assignment ERSP Project descriptions
	Wed	Reflection 1 Log set up CS110/ERSP contract ERSP study consent form	Group work and team building Template of in-class activities Tips on effective work

Graded on a 3-point scale as shown in the syllabus (and here):

Homework	Score
Thoughtfully completed and on-time	2
Lacking, or completed after deadline (<i>up to 24 hrs</i>)	1
Not done (<i>beyond deadline+24 hrs</i>)	0

Submit these on Gradescope

Format of Class

- HW assignments (due before each lecture)
-  Participation activities (done in-class)
- Logs (due weekly)
- Research Group Meeting **Attendance**
- Research Group **Contribution**
- **Project proposal** (a lengthy paper)
- **Final presentation**

We will meet **2 times a week** for lecture –


*some lecturing done, but mostly it'll be **group activities***

Lectures will **NOT** be recorded as a general rule

- I will share all my class notes/lecture with you after lecture is over

We will have lots of activities, readings, demonstrations & examples

Attendance & Participation

- HW assignments (due before each lecture)
-  Participation activities (done in-class)
- Logs (due weekly)
- Research Group Meeting **Attendance**
- Research Group **Contribution**
- **Project proposal** (a lengthy paper)
- **Final presentation**

Unlike many of your CS courses, ***we will take attendance every time in this class***

- You are expected to be self-driven and engaged

You must attend ***each class on time***, and ***participate actively*** in the class activities


- You may miss 1 lecture only

You will receive scores as shown in the syllabus (and here):

Attendance & Participation Level	Score
Present, on-time, actively participating	2
Present, on time, but not actively participating	1
Present and actively participating but late	1
Absent	0
Late and not actively participating	0

If you have an emergency or an extended illness, please contact Prof. Matni as soon as possible. He may ask for a doctor's note.

Logging Your Research Activities

- **HW assignments** (due before each lecture)
- **Participation activities** (done in-class)
-  ◦ **Logs** (due weekly)
- Research Group Meeting **Attendance**
- Research Group **Contribution**
- **Project proposal** (a lengthy paper)
- **Final presentation**

Throughout the ERSP program (i.e., all year)


you will keep a **regular log of your research activities and keep it updated!**

We will check your log once per week (usually on Fridays) and you will receive scores as shown in the syllabus (and here):

Log Work	Score
Log is up-to-date and complete	2
Log is partially up-to-date, or incomplete	1
Log is not updated	0

Logs go in the shared Google folder
(this is shared with the team *and* with the Prof + TA)

Research Group Meetings

- **HW assignments** (due before each lecture)
- **Participation activities** (done in-class)
- **Logs** (due weekly)
-  Research Group Meeting **Attendance**
- Research Group **Contribution**
- **Project proposal** (a lengthy paper)
- **Final presentation**

Each week you will attend a **group meeting** with your **research (project) group**

- These are weekly meetings with you + your group + research mentors

One person in each group will be designated as the *attendance taker*

- You will receive credit for attendance if you are on time and stay the full time
- You must keep the attendance sheet up to date
- You may miss up to **one** research meeting without penalty

Group Attendance records go in the shared Google folder

Research Group Contributions



- **HW assignments** (due before each lecture)
- **Participation activities** (done in-class)
- **Logs** (due weekly)
- Research Group Meeting **Attendance**
- Research Group **Contribution**
- **Project proposal** (a lengthy paper)
- **Final presentation**

At the end of the quarter, you will judge each other's contributions

- i.e., group members will rate each other

From this info + my/the TA's observations, I will make a determination about each student's contribution to the team

- In a healthy team, everyone will get full marks here
- This means **consistency** from every observer

“Big Deliverables”

- **HW assignments** (due before each lecture)
- **Participation activities** (done in-class)
- **Logs** (due weekly)
- Research Group Meeting **Attendance**
- Research Group **Contribution**
- **Project proposal** (a lengthy paper)
- **Final presentation**

Project Proposal

You will turn this in at the end of the quarter (you will be told the schedule)

Final Presentation

To be given during the final exam period (i.e., Week 11 of the quarter)

These are group submissions, but I expect to see equal contributions from ALL members.

Members will get individual scores.

Project Assignments

Project Group Assignments are done!

- I will reveal these to you in a few minutes
- I tried my best to assign you to projects you labeled “*Extremely*” or “*Very*” interested in

If appropriate, you should start attend meetings v. soon with the research labs

- More details to emerge on this during this week

Research Group Meetings

Regular Meetings with Course Mentor/TA Thomas Schibler

- As needed during his office hours
- Weekly, starting around Week 6 or 7 – will continue through-out the rest of the year

Regular Meetings with Research Advisor(s)

- Start these early, usually by week 2 thru 4

Regular Meetings within Your Group

- Start now! Set a regular time for you all to meet!

Contract Based Grading

We are grading you on your accomplishments!

To get an **A** in this class:

- Participate in **class** and be punctual (No more than 1 absence/no submission)
- Attend your research group **meetings** (No more than 1 absence)
- Complete and submit your **logs** (At least 9 on-time complete logs)
- HW Assignments: At least 13 done **on-time** and no “skips”
(i.e. all homework must be done – and the quality of your work will count as well)
- Research Group Contribution: Healthy research group **contribution**
- Final Project and final presentation: “**High Pass**” (rubrics and grading criteria will be provided)

ERSP Contract: Your responsibilities in this course. Read it by Wed.

Your Responsibilities as an ERSP Participant

1

To participate in the ERSP program **actively and fully** for the full 3-quarter duration of the program

- Each quarter you are expected to register for the course associated with the ERSP program as instructed and to complete all work associated with that course

Professionalism:

- To work (at least) the expected number of hours weekly
- To attend class and group meetings regularly and punctually (starting this week!)
- To behave professionally toward your ERSP group members and the faculty and students who comprise the research group you are placed with
- To behave ***ethically*** with each other and the instructors and mentors ([READ THIS](#))

ERSP Contract: Your responsibilities in this course. Read it by Wed.

Your Responsibilities as an ERSP Participant

2

To complete the assigned work for the ERSP course in a *timely fashion*,
and to "***pull your own weight***" within your group project

- If a group member is not doing this, it is the responsibility of the other group members to let the Prof. or the TA know

To keep an *open line of communication* between yourself, the members of your group, your course/research mentors, and Prof. Matni

- In particular, you must let Prof. Matni and TA Schibler know if any issues arise, ***as soon as they arise***.

To balance your time so as to maintain success in your other courses, as well as in ERSP

Current Research: Educational Programs

On a separate note,

Prof. Mirza and others study ERSP as part of an NSF grant

The ***ERSP-Consent-Form*** is to get your informed consent as “human participants” in this study

- Please read this (longish) form by Wednesday
- I’ll get you paper copies of the last page of it to sign on Wed.
- We hope you will give consent, *but you are not required to do so*

Project Assignments for ERSP 23-24

Prof. Balkind	Riley Chou	Aden Jo	Kate Unger	
Prof. Beyler	Alvin Wang	Edward Ding	Jennifer Zhu	Kyle Zhao
Prof. Bultan	Rick T. Zhang	Kaitlyn Tom	Shelly Zhu	Suhrit Padakanti
Prof. Chang	Peiyang Song	Lindsey Wen	Ethan Solomon	Riya Gupta
Prof. Hollerer	Ajay Liu	Qi Wu	Frank Zhong	Towela Phiri
Profs. Kruegel & Vigna	Rachel Jiang	Grace Feng	Yarwin Liu	Nikhil Kapasi
Prof. Lokshtanov	Ashwin Rajan	Xinghan Yang	Isabella Ward	Edwin Medrano Villela
Prof. Sherwood	Samantha West	Claire Pemberton	Ivan Hernandez	Mariana Rosillo
Prof. Singh	Will Corcoran	Wyatt Hamabe	Niyati Mummidivarapu	
Prof. Yang	Palvi Sabherwal	Leyang Ni	Dalia Sebat	Mitali Gaidhani

First Encounters with Research????



What is Research Anyway?!

Prof Pedro Lopes (U of Chicago)

Research/Job Talk (first 18 minutes)

<https://gauchocast.hosted.panopto.com/Panopto/Pages/Viewer.aspx?id=457314a8-8539-4b83-ae1a-b08a0064b28a>

Discussion

Start by logging into your Google Drive accounts (*you have one with your UCSB Gmail account*) and copying the template for today's in-class activity from the CS110 website

More Videos to Watch and Reflect On

Prof Giovanni Vigna (UCSB)

Computer Security Research

<https://www.youtube.com/watch?v=4tk8eib8Rlc> (10 mins + 5 min reflection)

Prof. Fei-Fei Li (Stanford)

Human-Centered Artificial Intelligence Research

<https://www.youtube.com/watch?v=FECZcSjOkRE> (short 1.5 min video)

<https://www.youtube.com/watch?v=40riCqvRoMs> (18 mins + 5 min reflection)

What's Happening on Wednesday?

Prepare by doing the listed homework on the Main Website

- OPTIONAL: Watch the videos listed in prior slides and write something on them
- Copy this template onto your Google Doc:
https://docs.google.com/document/d/1QJQa3bprwXCIsOk3p8TbOsNbABef65hJo_FuoXwU2rA

More in-class discussions and exercises

YOUR TO-DOs

Before Wednesday Lecture:

1. Read the **syllabus**, if you haven't yet! 😊
2. Make sure you can get to the course **Gradescope** module (*nothing to submit 4 now*)
3. Go over the “**pre-class assignments**” – see the Main Website
 - One is a Google Form questionnaire
 - One is to read, then answer questions, **in your log**
(that's in the new Google folder we made for you)
 - For the last 2 items (*CS110/ERSP contract, ERSP study consent form*), just read them and we'll discuss them in class

Questions? Ask us in class on Wednesday!

</LECTURE>