

# CAP 5108 Research Methods for Human-centered Computing

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# Course Information

- Course home page: <https://www.cise.ufl.edu/class/cap5108sp18/>
- Textbook: Human-Computer Interaction An Empirical Perspective, I. Scott MacKenzie
- Grading:
  - Weekly quiz (5x2pts = 10pts, individual)
  - Exam (15 points, individual)
  - Mini-project (2x10pts = 20 pts, individual)
  - Ethics training (5pts, individual)
  - Class participation (3pts, individual)
  - Peer grading (4pts for 4 grading assignments)
  - Class presentation (3pts, individual): Bring a video to class and discuss why it is relevant to the subject matter
  - Project (40 points, group): Pitch (5pts), Update (5pts), Final movie (5pts), Four page write up (25pts, 5 points by peer grading), Best project by class vote (extra credit, 2 pts)
- Grades will be curved. Tentatively, top 10% of the class can expect an A grade.

# Expectations

- All assignments marked as individual assignments – you are expected to do them on your own. It's okay to discuss the problem statement, or concepts that you don't understand, but the code is written by you.
- Late policy: -1 point for every 24 hrs past deadline. If you don't submit the assignment, you get 0.
- There will be no makeup assignments. In case of a legitimate problem (e.g., medical emergencies), the points of the last assignment will be applied to the missed assignment...in this case, the last assignment is the Project Writeup.
- Plagiarism/Cheating: At a minimum, you and the person you copied from will get a zero on that assignment, and a decrease of one letter grade on their final course grade. This is in addition to penalties given by Student Affairs.
- I expect you to do the readings before coming to class.

# Communication

- I expect formal communication, which means full sentences. Please practice this in your emails to me. Emails with incomplete sentences or spelling shortcuts (can u tell me when HW0 is due) will be ignored.
- Email: Subject should have class number followed by topic.
  - E.g. [CAP5108] Found a typo in Assignment 1
  - I use filters, so if your email does not have [CAP5108] in the subject line, it will get lost.
- Post questions to Canvas first (before you send email to me or your TA)
- You are expected to attend class. Important announcements will be made in class because I like to take your feedback into account while changing dates on exams/assignments etc.
- I have a poor memory for logistics — when in doubt, refer to class syllabus or webpage. If there is confusion, bring it up in class so that we can address it for all students together.
- I repeat — the above point is important. If you ask me the due date for an assignment over email, I will not reply because I know that I will get it wrong : )

# Soft Skills

- All students need to understand the basics of time management
  - E.g., “I have two assignments due on the same day” is not a reason to not submit the assignment.
- The successful student is a self learner. Homeworks, assignments and exams will contain two categories of questions: one category will be questions related to topics we have discussed in class, one category will be advanced topics in the textbook which will require you to learn on your own. Grading will be such that if you only do the first category of questions, you will get a B. If you want an A, you need to stretch yourself and answer the second category of questions.
- We will use R in this class. You are expected to pick it up. This is the language that is THE language of empirical data analysis today, and is a highly valuable skill when looking for jobs/internships. But we are learning the fundamentals of empirical work as it relates to human-centered computing in this class. Getting to learn R is a perk.

# What is Human-Centered Computing?

- Computing as it relates to the human condition
- Examples: Assistive technology, Rehabilitative technology, Computer Science Education, Human-computer Interaction, Social computing, Virtual Reality, Perception of Virtual Characters
- Broad, heterogenous
- Common characteristic: technology + human

# What are “Research Methods”?

- Types of research, e.g., anthropologists versus behavioral economists
- Types of data
- Principles and practices to avoid bias, confounds
- How to extract meaning (correlation, causation)
- “Rules” for citing related work, presenting your experiments, describing findings and impact

# Why do we need to study Research Methods in Human-Centered Computing?

- You will find topics in common with similar jump-start courses in Psychology, Statistics, Sociology, Political Science
- Typically, each field of study emphasizes the methods most common in that community, e.g., Sociology will emphasize interviews and observational studies, Statistics will emphasize data analysis and significance testing under different conditions.
- These are all good follow up classes to take depending on your particular research focus
- CAP 5108 provides the fundamentals needed by a beginning graduate student to design experiments relating to human-centered computing, conduct human subjects data collection, analyze and present the results to a computing audience



# But I am a CISE/CE/CS student...

- Maybe
  - You are developing an HCI/AR/VR system and you need to figure out which system works better for users?
  - You are comparing the performance of two algorithms and you need to figure out how to provide an evidence based argument for which is better?
  - You are identifying biases in large computer vision datasets, or, doing analysis on social media or news to determine trends, and you need to figure out if your findings are real or a matter of chance?

# What you should be able to do after this class

- Define a basic hypothesis
- Design an experiment to test hypothesis
- Identify basic types of data collected in human-centered research
- Understand the mechanics of collecting data from human subjects
- Test hypothesis with basic statistics
- Report your results
- *In other words, consider it an analog for Lab 101 for Biology or Chemistry or Programming Fundamentals 1*

# What this course should not be expected to achieve

- You will not magically become an expert in human-centered computing
- You will also not learn every kind of advanced statistical technique that your community has ever used
  - Remember– HCC is very heterogenous
- All of this comes through practice, and advanced course work and research work in your area.

# Some great examples of research

- Observational method <https://www.youtube.com/watch?v=51z7WRDjOjM>
- Correlational method
- <https://www.youtube.com/watch?v=q-7zAkwAOYg>
- Experimental method
- <https://www.youtube.com/watch?v=zJCD3R3LlSs>
- <https://www.youtube.com/watch?v=uO8wpm9HSB0>