Course Syllabus

Jump to Today

Please note that the specifics of this Course Syllabus are subject to change. Instructors will notify students of any changes and students will be responsible for abiding by them. Even if you print this syllabus, please check the online version often.

Description

HCDD 440: Human-Centered Capstone (3 credits)

The Human-Centered Design and Development Capstone course develops the research orientation and creative problem-solving necessary for successful careers. The capstone develops these skills in the context of a semester-long project, the solution to which requires the integration of knowledge, skills, and analytic techniques taught in the core curriculum. The capstone will also give students real-world experience in which they will need to work in teams and will be coached on ways to translate analytic outcomes into meaningful and actionable information for decision-makers.

The course is intended for seniors who have completed the core courses. The capstone projects will integrate knowledge gained in technical subjects such as usability engineering, software construction and engineering, and mobile computing as well as general information technology topics such as machine learning, data mining, data integration and visualization, and privacy and security. Students will also hone their presentation and technical writing skills, generating effective reports that not only explain their analytic processes, and assumptions underlying the processes and outcomes but also communicate the limitations of their approach and potential alternate strategies.

Prerequisites

- IST 261 or IST 361
- HCDD 340 (recommended)
- HCDD 364W

Objectives

Upon completion of this course, the student will be able to:

- Use systems theory to analyze real-world challenges of people, software, and hardware.
- Formulate a problem description to communicate with different stakeholders.
- Identify how human-centered approaches can inspire technology design.
- Develop and evaluate a socio-technological solution to a real-world problem.

- Hone project management, analytical, presentation, and technical writing skills.

Instructor and TA

- **Instructor**: Syed M. Billah (https://ist.psu.edu/directory/skb5969) (preferred name: **Billah**, email: sbillah@psu.edu (mailto:sbillah@psu.edu))
- **TA 1**: **Adrew** Woan (preferred name: **Andrew,** email: ajw6289@psu.edu (mailto:ajw6289@psu.edu))
- **TA 2**: Ho Yin Ng (preferred name: **Sam**, email: hzn5135@psu.edu (mailto:hzn5135@psu.edu))

Class Information

- **Date/Time:** Tuesday, Thursday 3:05 PM - 4:20 PM
- **Location:** Westgate Building E206
- **Instruction Mode:** In-person (class Zoom: https://psu.zoom.us/j/92699148288 (https://psu.zoom.us/j/92699148288))

Office Hour

- **In-person**: TBD (office: E308 Westgate Building)
- **Remote**: By appointment (Zoom: https://psu.zoom.us/j/92699148288 (https://psu.zoom.us/j/92699148288))

Course Structure

The goal is to give students maximum creative freedom—the freedom to choose their own work to showcase in their portfolio before graduation.

- There won't be any traditional lectures, quizzes, midterms, or final exams. Instead,
  - We'll set five milestones with well-defined rubrics (see below) for each team to meet.
  - The instructor will act as a manager, assist each team in defining the scope, and set the expectations for each team.
  - The TAs will act as the shadow group member for each team.
- Students must work in groups of two to four.
  - Single-person groups or group sizes over 4 will need special consideration.
- Since teamwork is crucial for capstone projects, we will designate Tuesdays as a "group work" day for students to brainstorm and collaborate during class time.
- We'll propose some interesting project ideas, but students are also free to come up with their own.
- Mandatory Attendance
  - At most 3 classes can be missed without penalty (students must inform team members and the instructor in advance)
- A shared document to log continuous progress report

Project Structure

- A project can be of 2 types:
  1. Implementation-focused
     - Deliverable: software/hardware artifact and demo
     - A public presentation on YouTube/IST
  2. Design-focused
     - Deliverable: design artifact and demo
     - A public presentation on YouTube/IST

• A project must meet the following requirements:

  - Should be sufficiently complex but feasible to carry out in 14 weeks
  - Should have two aspects:
    - human/social factor(s) and
    - technology/computational factor(s)
  - Should be well-positioned in the literature (i.e., prior work)
  - Should follow an appropriate methodology
  - Should have a clear contribution(s)
  - Should be suitable for group work

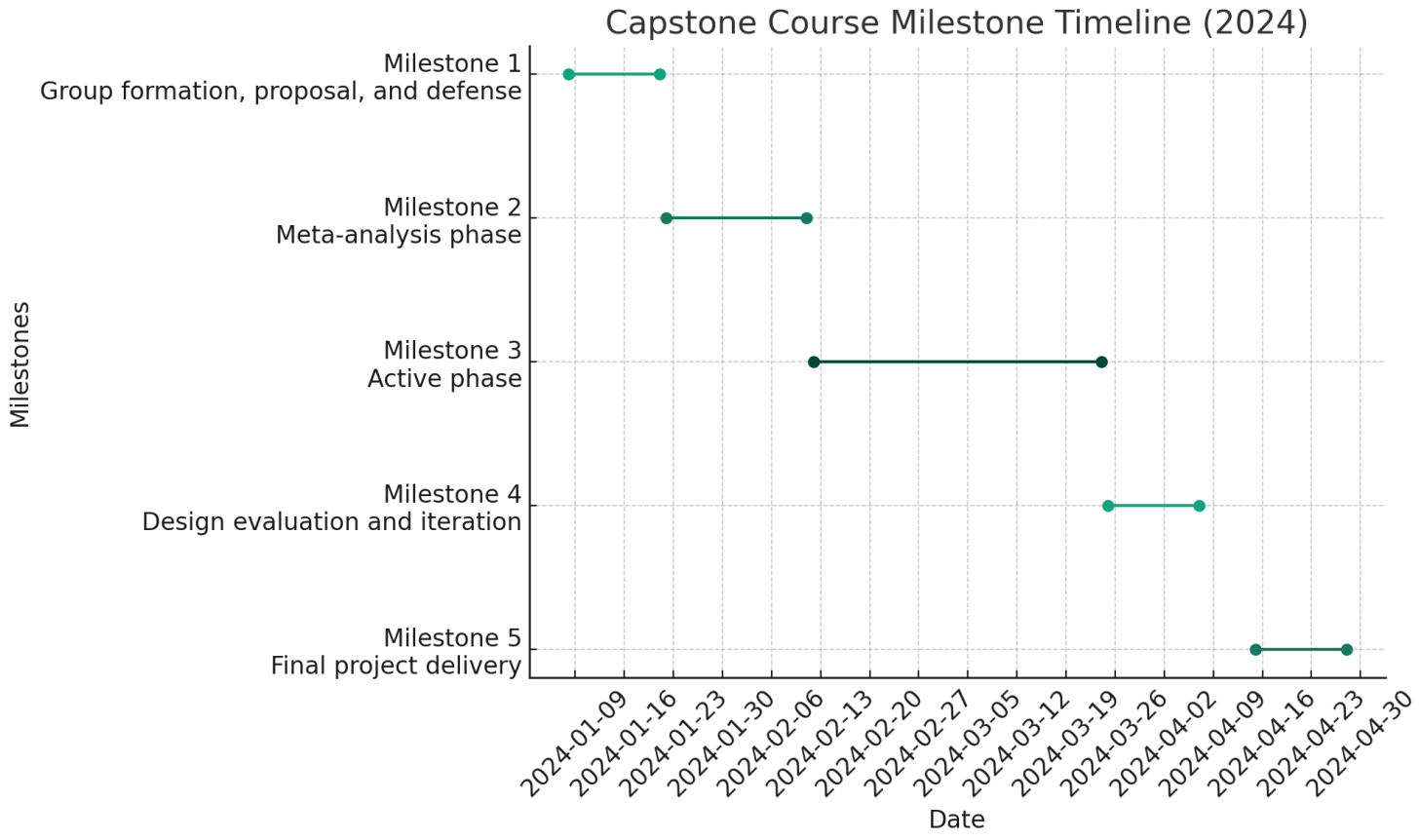
Project Eligibility Checklist

- What is the problem domain of this project?
- What is the problem statement or research question(s)?
- What type of project is this?
  - Implementation-focused (e.g., software/hardware artifact)
  - Design-focused (e.g., design artifact)
- What are the human/social factors and what are computational factors?
- Why the project is not trivial? How is it done today, and what are the limits of current practice?
- What methodologies will be used (tentatively)?
- Who will do what?
- What is the expected outcome/contribution?

Milestones

Checkpoints	**Description**	**Timeline**
Milestone 1	Group formation, project proposal, and proposal defense	Week 1 - Week 2
Milestone 2	Meta-analysis phase: project planning, literature review, background and related work, requirement analysis,	Week 3 – Week 5

	competitive analysis, stakeholder analysis, learning new tools or frameworks	
Milestone 3	Active phase: early design prototype, interview study, implementation	Week 6 – Week 11
Milestone 4	Design evaluation, iteration, and revision phase	Week 12 – Week 13
Milestone 5	Final project delivery (a recorded presentation, demo, artifacts)	Week 15 – Week 16



Materials

- In Canvas and online, posted as assigned.

Assignments & Grading

Category	Breakdown	Points (%)
Groupwork	Group collaboration, individual contribution, and attendance	25
	Groupwork as reflected by peer review (5%)	
	Individual contribution as reflected by the progress log (15%)	
	Individual contribution as indicated by the attendance (5%)	
Milestone 1	Project proposal and proposal defense	10
Milestone 2	Meta-analysis phase	10
Milestone 3	Active phase	20
Milestone 4	Evaluation, iteration, and revision phase	15
Milestone 5	Project delivery	20
	Pre-recorded presentation (for showcasing/archival) (5%)	

	Live demo, in-class presentation (5%)	
	Artifact (e.g., software, design, scholarly article) delivery (10%)	
Grand Total		**100**

Course Grading Scale

The following are the minimum cutoffs for each grade:

- 93.00% = A
- 90.00% = A-
- 87.00% = B+
- 83.00% = B
- 80.00% = B-
- 77.00% = C+
- 70.00% = C
- 60.00% = D
- less than 60.00% = F

Course Policies and Expectations

- Stay in constant contact with your group throughout the semester.
- Logging into Canvas - Students are expected to login regularly to check for course updates, announcements, emails, discussions, etc.
- Emailing through Canvas - Students are expected to use Canvas for all course email communication.

Academic Integrity

Penn State and the College of Information Sciences and Technology are committed to maintaining **Penn State's policy on Academic Integrity (http://senate.psu.edu/policies-and-rules-for-undergraduate-students/47-00-48-00-and-49-00-grades/#49-20)** in this and all other courses. We take academic integrity matters seriously and expect you to become a partner to the University/College standards of academic excellence.

For more information, please review these policies and procedures:

- **College of IST Academic Integrity Resources (https://ist.psu.edu/current/undergraduate/advising/integrity)**

While utilizing additional sources outside of this class is encouraged for gaining a better understanding of course concepts, seeking explicit answers for graded assignments from outside sources (e.g. Course Hero, Chegg, tutoring services like tutor.com, etc.) is considered CHEATING and will not be tolerated. Sanctions range from failure of the assignment or course to dismissal from the University. Additionally, sharing course content without permission is a violation of copyright and may result in university sanctions and/or legal ramifications. Contact your instructor with questions related to this topic.

University Policies

Review current information regarding various Penn State policies (such as copyright, counseling, psychological services, disability and military accommodations, discrimination, harassment, emergencies, trade names, etc.) on the **University Policies (https://docs.google.com/document/d/1FIQdII2qw3SJOIgQWTWRByCxSbsnY6DcZA0JHzL4yBk/pub)** page.

Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated and can be reported through Educational Equity via the **Report Bias webpage (http://equity.psu.edu/reportbias/)** (http://equity.psu.edu/reportbias/).

Resources

Find extensive information and links to many Penn State and IST resources (including the Penn State libraries, video conferencing tools, technology and software, writing and research help, and much more) on the **Resources (https://docs.google.com/document/d/1Zsu5Lgaic3kLLiM3co5mxWU5B7lOfu15sppAQvsym6E/pub)** page.

Schedule

The following schedule outlines the topics covered in this course, along with the associated time frames, readings, activities, and assignments. All due dates reflect Eastern Time (ET). Specifying the time zone ensures that all students have the same deadlines, regardless of where they live.

Course Summary:

Date	Details	Due
Tue Jan 9, 2024	Academic Integrity Acknowledgment (https://psu.instructure.com/courses/2312083/assignments/15887989)	due by 11:59pm
	Students' Intro (https://psu.instructure.com/courses/2312083/assignments/15887990)	due by 11:59pm
Thu Jan 11, 2024	Attendance Quiz (Jan 11) (https://psu.instructure.com/courses/2312083/assignments/15887981)	due by 3:05pm
	Group Formation and Progress Log Creation (https://psu.instructure.com/courses/2312083/assignments/15887994)	due by 11:59pm
Thu Jan 18, 2024	Attendance Quiz (Jan 18) (https://psu.instructure.com/courses/2312083/assignments/15887977)	due by 3:05pm
	Peer Eval (Jan 19) (https://psu.instructure.com/courses/2312083/assignments/15888003)	due by 11:59pm
Fri Jan 19, 2024	Weekly Progress Log Summary (Jan 19) (https://psu.instructure.com/courses/2312083/assignments/15888007)	due by 11:59pm
Tue Jan 23, 2024	Attendance Quiz (Jan 23) (https://psu.instructure.com/courses/2312083/assignments/15887984)	due by 3:05pm
Thu Jan 25, 2024	[In-class presentation] Proposal Defense (https://psu.instructure.com/courses/2312083/assignments/15888011)	due by 3pm
	Attendance Quiz (Jan 25) (https://psu.instructure.com/courses/2312083/assignments/15887978)	due by 3:05pm
	Weekly Progress Log (Sep 8) (https://psu.instructure.com/courses/2312083/assignments/15888008)	due by 11:59pm
	Project Proposal Submission (https://psu.instructure.com/courses/2312083/assignments/15888006)	due by 11:59pm
Tue Jan 30, 2024	Attendance Quiz (Jan 30)	due by 3:05pm

Date	Details	Due
	(https://psu.instructure.com/courses/2312083/assignments/15887982)	
	Project management (https://psu.instructure.com/courses/2312083/assignments/15888009)	due by 11:59pm
Thu Feb 1, 2024	Attendance Quiz (Feb 1) (https://psu.instructure.com/courses/2312083/assignments/15887980)	due by 3:05pm
	Quiz - Getting Realistic about Group Work (https://psu.instructure.com/courses/2312083/assignments/15953978)	due by 3:25pm
	Project Breakdown (https://psu.instructure.com/courses/2312083/assignments/15888010)	due by 11:59pm
Tue Feb 6, 2024	Attendance and Update Log Quiz (Sept 20) (https://psu.instructure.com/courses/2312083/assignments/15887986)	due by 9:20am
Wed Feb 7, 2024	Qualitative Coding Exercise (https://psu.instructure.com/courses/2312083/assignments/15887979)	due by 11:59pm
Thu Feb 8, 2024	Attendance and Update Log Quiz (Sept 22) (https://psu.instructure.com/courses/2312083/assignments/15887975)	due by 9:20am
	UML Refreshers (take home quiz) (https://psu.instructure.com/courses/2312083/assignments/15887988)	due by 11:59pm
Tue Feb 13, 2024	Milestone 2: Class Presentation and Report (https://psu.instructure.com/courses/2312083/assignments/15887991)	due by 2:30pm
	Peer Eval (2nd) (https://psu.instructure.com/courses/2312083/assignments/15888004)	due by 11:59pm
Thu Feb 29, 2024	Peer Eval (Oct. 13) (https://psu.instructure.com/courses/2312083/assignments/15888001)	due by 11:59pm
Thu Mar 7, 2024	Design Specification (Deliverables)	due by 11:59pm

Date	Details	Due
	(https://psu.instructure.com/courses/2312083/assignments/15887992)	
Thu Mar 14, 2024	Peer Eval (Oct. 27) (https://psu.instructure.com/courses/2312083/assignments/15888002)	due by 11:59pm
Tue Mar 19, 2024	Peer Eval (March 19) (https://psu.instructure.com/courses/2312083/assignments/15888005)	due by 11:59pm
Tue Mar 26, 2024	Early Design Demo (https://psu.instructure.com/courses/2312083/assignments/15887993)	due by 11:59pm
	One-on-One Peer Feedback (part 1) (https://psu.instructure.com/courses/2312083/assignments/15887997)	due by 11:59pm
Thu Mar 28, 2024	One-on-One Peer Feedback (part 2) (https://psu.instructure.com/courses/2312083/assignments/15887998)	due by 11:59pm
	Peer Eval (Nov. 10) (https://psu.instructure.com/courses/2312083/assignments/15887999)	due by 11:59pm
Wed Apr 17, 2024	Peer Eval (Nov. 30) (https://psu.instructure.com/courses/2312083/assignments/15888000)	due by 11:59pm
Fri Apr 26, 2024	[Milestone 5] Showcase Projects in Penn State's Learning_Factory (https://psu.instructure.com/courses/2312083/assignments/15888012)	due by 11:59pm
	Milestone 5: Final Demo and Presentation (Part 1) (https://psu.instructure.com/courses/2312083/assignments/15887995)	
	Milestone 5: Final Demo and Presentation (Part 2) (https://psu.instructure.com/courses/2312083/assignments/15887996)	
	Peer Evaluation of Group 1 (https://psu.instructure.com/courses/2312083/assignments/15887985)	
	Peer Evaluation of Group 2	

Date	Details	Due
	(https://psu.instructure.com/courses/2312083/assignments/15887987)	
	Peer Evaluation of Group 3 (https://psu.instructure.com/courses/2312083/assignments/15887983)	
	Prior Projects (https://psu.instructure.com/courses/2312083/assignments/15922085)	