

ME Capstone Design (3 or 6 cr)

Semester(s): Summer 2022 or Summer-Fall 2022

Official Meeting Times:

M-Th 11:30 am - 1:00 pm

- Most Mondays (General class sessions in EP 214)
- Tuesday-Thursdays (allocated for team meetings)

Course Schedule and Deliverables:

<https://www.webpages.uidaho.edu/mindworks/Capstone%20Design/summer-fall20.htm>

Course Resources and Guides:

www.webpages.uidaho.edu/mindworks/capstone_design_20_DC.htm

Faculty:

Kamal Kumar – ME	(kkumar@uidaho.edu)	GJ 234i
Steve Beyerlein – ME	(sbeyer@uidaho.edu)	EP 324i

Support Staff:

Becky Colpaert – Administrative Assistant	(bcolpaert@uidaho.edu)	EP 324
Ankit Gupta – Instrumentation Specialist	(ankitg@uidaho.edu)	GJ 234A
Bill Magnie – Shop Supervisor	(bmagnie@uidaho.edu)	GJ 124
Jared Gray – Grad Student Mentor		GJ 113

COURSE OBJECTIVE: Prepare engineering students for professional practice, specifically as encountered in entry-level design engineering positions.

Prerequisites:

ME 424/426:

ME 301
ME 313
ME 325
ME 330
ME 345

COURSE MATERIALS:

- **Personal logbook** for notes, calculations, sketches, responses to instructor/mentor questions, assessment and reflection, and evidence of progress toward course learning outcomes
- Logbook may be in written or electronic form (or both).

Note: The Mindworks website will act as your course textbook.

ABET LEARNING OUTCOMES

Engineering programs must demonstrate that their students attain:

1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3. An ability to communicate effectively with a range of audiences.
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5. An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

CAPSTONE COURSE ROLES & RESPONSIBILITIES

Course Instructors:

- secure sponsors, scope projects, set project budgets
- communicate course objectives, performance standards, milestone dates for project deliverables
- provide timely feedback on team processes and products
- monitor team and customer relations, facilitating open communication
- evaluate project deliverables and assign grades

Technical Advisors: Other UI faculty

- serve as external customer for competition/internal projects
- provide technical input and leadership to team/sub-teams
- provide input on evaluation of project deliverables and performance

Fabrication & Instrumentation Specialists:

- final word on shop safety and proper equipment/instrument usage
- inform advisors/guides on shop training and scheduling
- when requested, review designs for inventiveness & manufacturability

Shop Mentors:

- oversee safety, training, sign-up, and use of shop equipment
- provide consulting on prototypes, software and experimentation
- first contact for review of drawings/schematics and fabrication plans

Design Teams:

- display professional team dynamics, including high personal commitment
- take responsibility for project decisions and work areas, leading to timely and innovative products that can be attractively presented in short order
- keep advisors/guides/instructors/customers regularly informed of progress, decisions, and obstacles encountered

GRADING (COURSE EVALUATION)

Four Quadrants – Each account for 25% of course grade

-	Design Process	Design Product
Individual	<p style="text-align: right;">25%</p> 1) Logbook usage 2) Team member citizenship: - Joint contributions - Project time invested 3) One-on-one communication with instructor and mentors	<p style="text-align: right;">25%</p> 1) Team member citizenship: - Individual contributions - Value Added 2) Individual Design Assignments (i.e. Productivity) 3) Portfolio (documentation)
Team	<p style="text-align: right;">25%</p> 1) Team member citizenship: - Team Climate 2) Client interaction 3) Snapshot & EXPO Presentations 4) Instructor/Team Meetings 5) Project Management - Schedule - Budget	<p style="text-align: right;">25%</p> 1) Team member citizenship: - Work Product 2) Design/Product Quality (incl. Validation) 3) Design Reviews 4) Portfolio and Final Design Report 5) Client Acceptance

CAPSTONE PERFORMANCE EXPECTATIONS

We understand and value the learning outcomes for capstone design. We are committed to working together to achieve these at the highest possible level of performance. In doing this, we agree not to compromise the interests of our project sponsors or the rights of other students and staff associated with the course.

As an engineering professional enrolled in this course I WILL...

- Be tactful and honest in giving feedback; open-minded towards new ideas.
- Take responsibility for my actions as a prepared and trustworthy teammate.
- Proactively and resourcefully accept tasks and execute decisions.
- Fully apply all personal skills to produce high quality design work, putting interests of the team above self-interest.

As an engineering professional enrolled in this course I WILL NOT...

- Drop the ball on commitments I have made, leaving tasks incomplete.
- Freeze others out of decision-making through poor communication.
- Assign blame to others, contributing to negative team/course energy.
- Be apathetic toward producing a high-quality product in a timely manner.
- Marginalize interests of other teams and instructional staff.

As a member of the instructional staff I WILL...

- When requested, provide and accept honest feedback on performance.
- Take actions to promote self-directed learning and high-quality products.
- Mediate conflicts early, including team & customer issues.
- Clearly communicate course expectations and agendas for classes/meetings.

As a member of the instructional staff I WILL NOT...

- Remain passive or equivocal in the face of team conflict or customer issues.
- Deprive teams of decision-making authority, micro-managing work.
- Set expectations that cannot be met with resources available.
- Assign extraneous tasks that add little value.