

Panel 1A Capstone 101

Facilitator: Matthew Swenson (University of Idaho)

Sidekick: Beth DeBartolo (RIT)

Scribe: Hrushi Godbole (RIT)

Panelists:

Rachana Gupta (NC State University)

Sarah Oman (Oregon State University)

Greg Watkins (California State University – Chico)

Description: This panel is targeted for new instructors, those developing new programs, and anyone who would like to benefit from the shared wisdom of veteran instructors. Learn about best practices from people who have been there.

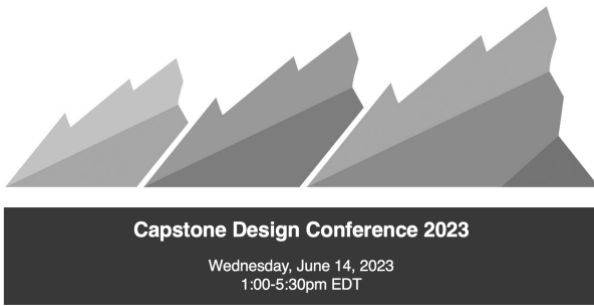
Starting Questions:

1. What is the first piece of advice that you would give a new Capstone Design instructor?
2. Where do you source your projects? Externally sponsored, community-focused, student proposed, internally created, etc. What do you see as the pros and cons of the different types of projects?
3. How much do you charge for externally funded projects, and how is the funding managed and utilized?
4. Do you take a more hands-on approach (with frequent teaching and coaching) or a more hands-off approach (letting the students management themselves) for instructing capstone design?
5. What's the best part of being a capstone instructor?

Notes:

MS - What is the first piece of advice that you would give a new Capstone Design instructor?

RG - Getting organized. Different from other courses - No strict rubric and correct answer, Team work based and dynamic. One place of all information - Course level and team level. Saves times due to logistics



Panel 1A Capstone 101

SO - Don't change many things at once. Inherit then understand and then change things later. Have someone to bounce ideas off (Capstone buddy). Be approachable beyond "professor" towards inclusive design

GW - Different class from both student and faculty perspective. Embrace chaos. Project management as opposed to teaching a class.

MS - Where do you source your projects? Externally sponsored, community-focused, student proposed, internally created, etc. What do you see as the pros and cons of the different types of projects?

GW - 100% external industry sponsored. Reach out to industry. Start with Alums and build a network. Reach out at closure as well. There is a published paper on this topic

RG - Most external sponsors - Startup, Corporate, State Agency, etc. Also, student ideas are welcomed - find mentors for them. Companies are looking to recruit students. Projects based on different department and admin divisions at the university itself. Find places to plug your program into different places. Real world projects is the focus.

SO - All types of projects. Research project - in person contact which is beneficial. . Industry project - typically no opportunity for in-person interaction Competition projects as well. Non-profit projects motivate the students much more. Caveat with student proposed - asymmetric student power - the proposer may become controlling. Express to client that these are 'students' - diplomatic expectation settings.

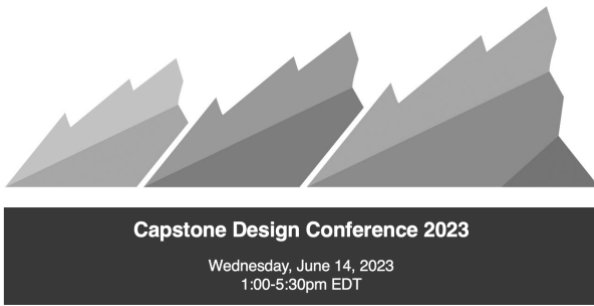
MS - How much do you charge for externally funded projects, and how is the funding managed and utilized?

GW - Pretty standardized - \$5000 fee. Of which \$3000 is towards hardware. Management fee is 15%. Different organization prefer different payment mechanism - cheque to research project funding

RG -

Three methods -

Online payment donation ; no expectation of prototype



Panel 1A Capstone 101

For profit - 5K to 10K - Tier system
Non Profit / Community - Have a dialogue - figure out reqs
15% management fee

SO - 5K donation + project expenses
Specific to foundation ; tax deductible ; department specific ; 5% management fee
But, keep it flexible based on

GW - Use 5% / 15% towards time to find new projects

MS - Is 5k per project

RG - Depends. If a company wants to do multiple projects then it may be less

MS - How does purchasing work and project budget work?

RG - Students don't have visibility to sources of money for projects. They have to come up with a budget rather than being given a budget.

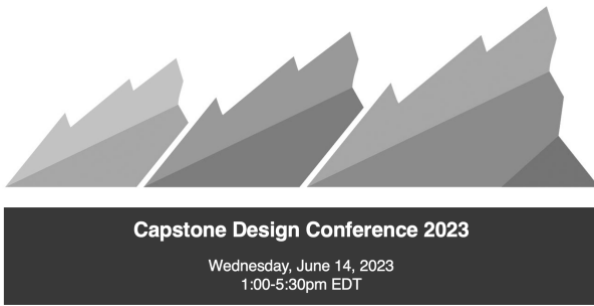
GW - Small things students buy and then expense them out. For larger things - procurement card for things that are \$100.

SO - There is a dedicated person to handle budgets. Hands off approach but are given a budget number.

MS - Do you take a more hands-on approach (with frequent teaching and coaching) or a more hands-off approach (letting the students management themselves) for instructing capstone design?

RG - Balanced approach. Learn from mistakes but are provided with templates, and resources given. Liberty to formulate a plan however timeline planning resources are provided. Suggest weekly meetings initially but can ease off when project things are settled. At least a quick meeting every 3rd week.

GW - Very hands-off initially. Faculty support varied per exit surveys. Made a change - faculty now gets teaching credit so its more formalized now.



Panel 1A Capstone 101

SO - Somewhere in the middle. There are three resources - capstone mentor, advisor and client. First few weeks of handholding. Then open hours, meeting every other week, etc. Sponsor commitment is crucial. Hands-off with the client.

SO - The best part is seeing students who are excited to apply

Dan Grindle NE - What was the biggest learning curve for you when you started teaching capstone

RG - Thought that I had to be very hands on. But realized students do learn by themselves - prodded to write a report on learning / lesson learned. These reflections demonstrated learning

GW - New faculty dynamics

SO - Laundry list of changes

RG - Ask for help. Design capstone conference was great! There is a lot of variability. Ask for research assistants, lab technicians, part-admin, etc. Access to maker space, etc.

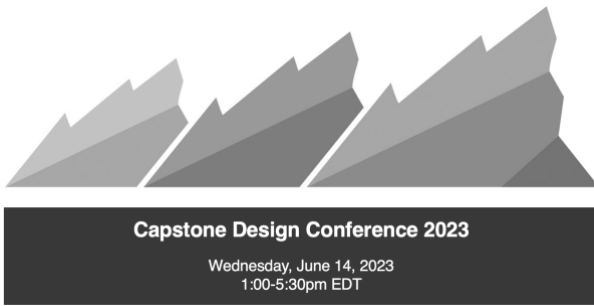
Mike Allen - At your respective institutions; are your Senior Design/Capstone Programs organized at the Engr College level or do the Departments organize independently. i.e do you have standardized industry sponsor agreements? Do you have a centralized college level industry sponsor outreach?

SO - ASU integrated but OSU has been discipline focussed. Currently, transitioning to multidisciplinary. Different disciplinary capstone directors meet weekly at OSU

GW - Department centric - Manf, Mechanical, Mechatronics - circuits and controls becoming important these days. Conversation with other departments.

RG - At NCSU, its discipline specific but a regular meet with other departments and some crossover of students that is need based. Each department has its own outreach but a monthly meeting to coordinate efforts.

MS - What's the best part of being a capstone instructor?



Panel 1A Capstone 101

GW - Alum community. Great community because it's a small/medium university. Satisfying to see students through their careers!

% of job offers that are received through capstones

RG - Satisfaction to see students through their career and maintain connections. Newness because each cohort is different. Ability to wear different hats - professor, pitch to prospective clients, project manager

MS - Thank you and resources.