Nifty Ideas and Surprising Flops
## Nifty/Flop Agenda

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## Sprint Planning v/s Gantt Chart

Capstone Design is 3 quarters - 30 weeks
Teams of ~4 students and ~6 teams per section

### Sprint Planning vs Gantt Chart

<table>
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<tr>
<th>Section</th>
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<tr>
<td><strong>Sprint Planning</strong></td>
<td><strong>Gantt Chart</strong></td>
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<tr>
<td><strong>Section</strong></td>
<td>Multidisciplinary Capstone</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>1 quarter (~8 weeks)</td>
</tr>
<tr>
<td></td>
<td>next quarter - students choose</td>
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<tr>
<td><strong>Project Manager</strong></td>
<td>Mandatory Role Rotations</td>
</tr>
<tr>
<td><strong>Define quarter goals</strong></td>
<td>● Think two weeks in detail</td>
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<tr>
<td></td>
<td>● Connect to quarter goals</td>
</tr>
<tr>
<td></td>
<td>● Formal report every 2 weeks</td>
</tr>
<tr>
<td></td>
<td>● Perform team assessment</td>
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Shraddha Sangelkar & Jay McCormack, Rose-Hulman
How we implemented Sprint planning?

2 week Sprints
Rotate Roles
Report out
Assess your Team

Shraddha Sangelkar & Jay McCormack, Rose-Hulman
Next year switching over to Sprint method

Teams who are good →
Perform well either way

Teams that struggle →
may struggle either way

- Less on their plate at a time
- Better ability to pivot
- Major deadline every 2 weeks
- Teams define the outcomes
  - (customized for them)
- Instructor controls the frequency
  - (streamlined intermediate assessments for you)

Project Planning experience is helpful!

Shraddha Sangelkar & Jay McCormack, Rose-Hulman
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The team is given a Microsoft Teams workspace for:

- File sharing
- Communication
- Document revision control
- Document simultaneous editing
- Task management

Tasks are assigned to individual or multiple students with a specific due date.

Students can see tasks in the Team Tasks tab or all tasks assigned to them in Tasks/Planner.

Just add the Tasks App to your Team to get started.
Task Management and Time Tracking

Hi Bryan. You have a task due.

Follow up on content for projects, videos etc.

In the plan Tasks linked to ME & CE Capstone - General
5/18/2023 Due in 1 day

View tasks in Microsoft To Do or Microsoft Planner

To change your notification settings, go to Planner for web, choose the settings button in the top right and then select Notifications.

Bryan Lewis, Brigham Young University-Idaho
Task Management and Time Tracking

- Clockify is a (free) time tracking app (web browser and mobile app interface)
- Students can be grouped by project team and/or client
- Project activities or general work tags allow for more detailed measurement of student activities
  - Class assignments
  - Meetings
  - Individual project work
  - FE Exam Prep
- Weekly/Custom Reports available for individuals, teams, projects, activities, and tags.

Bryan Lewis, Brigham Young University-Idaho
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• Single-semester capstone design course, runs in fall and spring

• 24 projects for ~110 students per semester

• Advanced composition course for Mechanical Engineering and Engineering Mechanics majors

• Major milestones are three reports and presentations, a Trade Show, and a project video. Most projects create a physical prototype.

• 70% of projects industry-sponsored, 30% faculty-sponsored

• Each team (4–5 students) assigned a faculty adviser (FA) and TA

• Each TA advises 8 projects/semester

• Each FA advises 1–2 projects every third semester

• I serve as Course Coordinator, with support from a Projects Coordinator
Idea: Contextualize ME 470 as a company

Company Mission Statement

ME 470, Inc. is an engineering consultancy firm offering engineering services including mechanical testing, design for manufacturability, and proof-of-concept prototyping. We serve a broad clientele in any industry that requires innovative mechanical solutions. Our student engineers represent the upper crust of new engineering talent. We serve them as well as our clientele through skillful mentoring and professional education services to set new standards for the future of our profession.

Instructor is not the “Professor,” but the “CEO”

The TAs aren’t “TAs,” they are “Project Managers” (PM)

Lectures are not “lectures,” they are “Company Meetings”

Company Meetings are run as “Professional Development Workshops”

Rotating Team Administrator meets weekly with CEO for 5-min update

Teaching emphasis on active accountability and leadership

Weekly performance awards at Company Meetings

Blake Everett Johnson, University of Illinois Urbana-Champaign
Verdict: ME 470, Inc. is a Nifty Idea

Observations supporting “Nifty Idea”

From Faculty Advisers, who had not advised in three semesters:
- Multiple comments about the students far outperforming what had been done by previous students, even pre-pandemic
- Boisterous enthusiasm after ME 470, Inc. Trade Show

From my personal observation:
- Students learning how to confront under-contributing teammates
- ZERO long-term free loaders

From long-term sponsors:
- “Best student team in a long time.”
- “Keep doing what you are doing, it is really working.”

Observations supporting “Surprising Flop”

Required much time to meet weekly with Team Administrators

Blake Everett Johnson, University of Illinois Urbana-Champaign
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Capstone Awards with Meaning: from Yawn to Yowza

• **Eureka**: Competition!

• **Floppy**: “Best Project” from jurors

• **Nifty Update**: New names, clear criteria, objective rubric!
  • **Most Complete**: Ready to be implemented and/or handed off.
  • **Biggest Impact**: Has potential to have a meaningful effect, not just $ or ROI
  • Inclusive and versatile: everyone has a chance
  • Reasonably Nifty!

Kris Jaeger-Helton, Northeastern University
Capstone Awards with Meaning: from Yawn to Yowza

• **Eureka**: Add the Student Choice Awards!
  • Support your fellow classmates
  • Vote for the team who …

• **Floppy**: “I vote for ME” or “WE vote for US!”
  • 18 teams, 14 self-votes
  • 4 ties for 1st

• **Nifty**: Vote for 3 teams and include concrete explanations
  • *Most Dedicated* and *Best Pivot*
  • Self-votes were allowed; clear winners were honored
  • Students wholeheartedly agreed that winning team(s) were deserving
  • Add *Turbo Boost Award* → Super Nifty!!!

Kris Jaeger-Helton, Northeastern University
The greatest award is the appreciation of the people.

~ Gopi Sundar

Best Pivot

The team that faced inordinate challenges, obstacles, setbacks, and slowdowns (from present circumstances and/or difficulties throughout the capstone) and showed innovation, adaptability, and hard work in overcoming them.

Best Pivot: Symptom Monitoring

"The Symptom Monitoring project had a plethora of hurdles throughout the ENTIRE Capstone. I loved seeing what they were able to accomplish!"

"Each of these groups [voted for] faced some challenges. Whether it was, as the project, travel related, etc., these groups really made the best of out less than ideal circumstances. Very proud and want to recognize them!"

Best Pivot: Some of what you said

"...had to learn about healthcare processes and HIPAA law used in healthcare that limit the ways in which patients and healthcare providers can communicate... had to do extensive research to be able to design an efficient follow up process, and had to come up with creative ways to validate process reliability.

"I commend them for bouncing back at the end of the semester and finishing their project!"

Best Pivot: Turbo Boost Award

Like many teams, they rose to excellence given the challenging circumstances. This team quietly and steadily pushed through obstacles, questions, and at times unavailable resources — also like every team. And then, with a final relentless perseverance, rose even higher.

What sets this team aside is that their project and outcomes didn’t perfectly fit a singular category, and yet they were consistently near the top of several categories!

Turbo Boost: Some great quotes

"They are also very strong in communicating their technical ideas and pathway during the presentation and in the Q&A session."

"... biggest strengths was their ability to teach themselves concepts they had never heard before (brain efficiency formula, warehouse layouts, automation in warehouses, etc.)."

"Before presenting a solution, there was a lot of research required on topics that are not "classic" to IE including Brain Simulation and learning a new software - AnyLogic."

"Being able to relate and test these concepts with what they had learned in their undergraduate degree"

Most Dedicated

The team that really put in the work throughout the year/semesters, and showed an exceptional payoff for it.

Most Dedicated: Some of what you said

"I was really impressed by how many things out of their initial scope most of these groups had to tackle. They were out of the project "comfort zone" and really maximized their project."

"The three [voted for] teams have exceeded the expectations on tackling the problem since capstone 1, they seemed like they could overcome their obstacles pretty quickly thanks to the nature of their project. And by capstone 3 their project was pretty much done, which gave it more time to perfect it."

"Appears: A Blockchain-Based Peer-to-Peer Lending Platform - The team had to learn about blockchain and apply their knowledge using this tool."

"Was very impressed throughout the process of how professional and polished out the idea of Appeals was. Other team Apps were the most professional projects and seemed to reflect a large effort behind them."

"Appears has been this team's existence for the last year!"
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Alum Voices: Capstone Podcast

Susannah Howe, Smith College

Design Clinic 20th Anniversary!

Podcast featuring DC alum teams
Alum Voices: Capstone Podcast

**Podcast Topics**
- Path since graduating/current work
- Expectations coming into capstone
- Skills transferring from capstone
- Memorable capstone experience
- Role of capstone in ugrad education
- Advice for future capstone students

**Podcast Interviews on Zoom**

**Review Zoom footage, pick content segments**

**Stitch segments, add musical interludes**

**Prepare and confirm transcripts**

**Post on Smith ScholarWorks & Spotify**

Susannah Howe, Smith College
Students resonated with specific skills, mindsets, and the ways DC transferred to different pathways after Smith
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Inclusive Team Contracts

**Inclusive teams leverage diversity**

- **Inclusive teams:**
  - practice specific behaviours
  - avoid specific behaviours

- **Inclusive teams workshop:**
  - add clarity, precision, and practicality about these behaviours

Watch out for social desirability bias!

Rebecca Laposa, University of Toronto and Mahadeo Sukhai, PhD co-founderIDEA-STEM [https://idea-stem.ca/](https://idea-stem.ca/)
Inclusive Team Contract

An Inclusive Team **Does:**

- Actively listen to team members to understand them
- "Yes, and"
  - A generative environment
- **Recognize an individual’s unique needs and strengths**
  - Amplifying the team’s collective strength
- **Create a safe environment where individuals can genuinely & freely express opinions**
  - Leaving room for reflection and consideration, “How do we feel about X?”
- **Embrace change and conflict**

Rebecca Laposa (University of Toronto) and Mahadeo Sukhai (IDEA-STEM)
An Inclusive Team Does Not

- Keep people out of the communication loop
- Shut down conversation
- Focus only on results/product and ignore process
- Jump immediately to criticism and the “blame game”
- Downplay the suggestions or ideas of other people
- Interrupt team members who are speaking
- Believe that inclusion is a simple, metricized “tick box” item, only for superficial corporate responsibility

Rebecca Laposa (University of Toronto) and Mahadeo Sukhai (IDEA-STEM)
Nifty Ideas ♦

and

Surprising Flops

Virtual Capstone Design Conference 2023

14 June 2023
Facilitator: Susannah Howe