Massachusetts Institute of Technology

NCORE

Welcome to

Design of MechE ENGAGE

“Empowering New Grads to Achieve Graduate Excellence”

Session Index #2219

PLEASE SILENCE ALL PHONES AND DEVICES
Thank you!

Massachusetts Institute of Technology

NCORE

Presented by:

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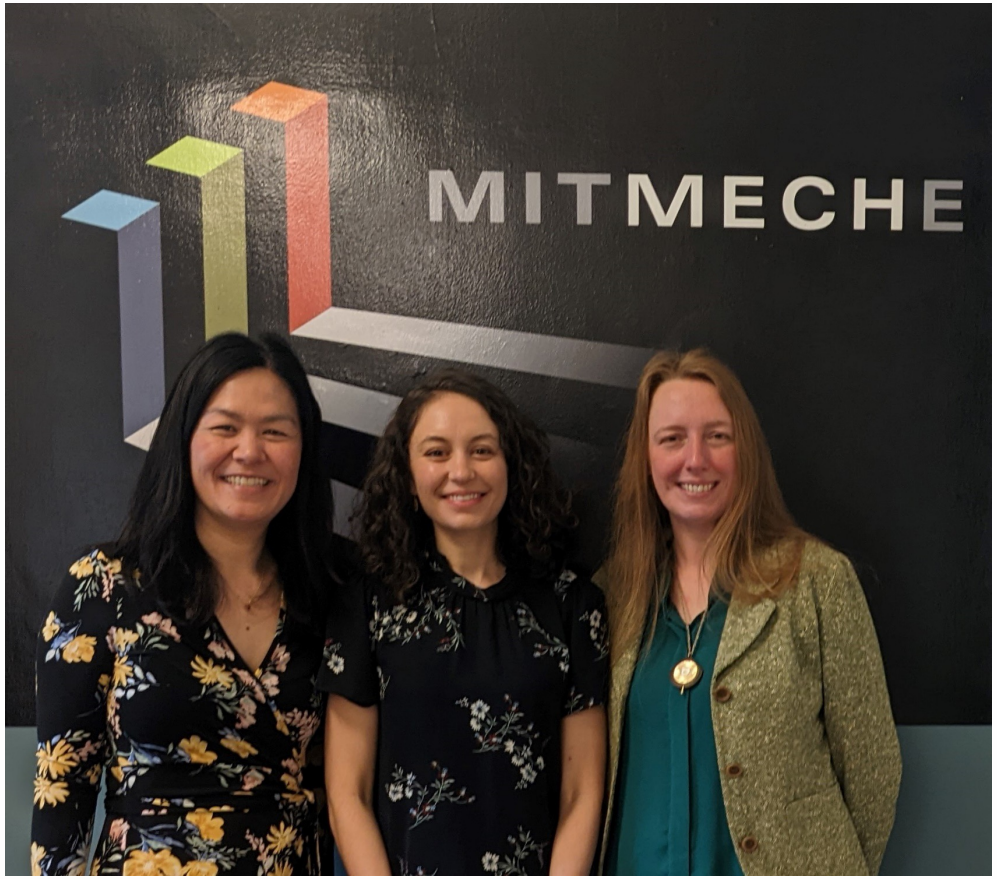
Department of Mechanical Engineering



LAND ACKNOWLEDGEMENT

We acknowledge the land on which we sit and occupy today as the traditional and ancestral home of the Multnomah, Kathlamet, Clackamas, Tumwater, Watlala bands of the Chinook, the Tualatin Kalapuya, and other Indigenous nations of the Columbia River.

MIT acknowledges that the land upon which MIT sits is the traditional unceded territory of the Wampanoag Nation. We acknowledge the painful history of genocide and forced occupation of their territory, and we honor and respect the many diverse indigenous people connected to the land upon which MIT is built.

Without them, we would not have access to this gathering and to this dialogue. We take this opportunity to thank and honor the original caretakers of these lands.

MechE ENGAGE

Equip new graduate students with skills, knowledge and confidence to navigate the challenges of graduate study at MIT through a single semester, semi-guided mentorship program

Workshop Overview

Goal: Participants will have the background and resources to pilot a similar graduate mentoring program at their institution

Workshop Elements

- Overview and MIT MechE background information
- Program design process and considerations
- Program structure and implementation
- Program evaluation

MechE ENGAGE NCORE Materials

Please see program handout and online materials for your use.

What's unique about grads at MIT MechE?

- ~50/100 incoming graduate students pursue terminal SM
- SM degree program is class and *research* intensive, requiring a thesis for graduation
- Incoming PhD students complete SM before starting PhD
- PhD students must complete qualifying exam between SM and PhD

Expand network via mentorship pod

Lab #1

PI #1

Group Members #1

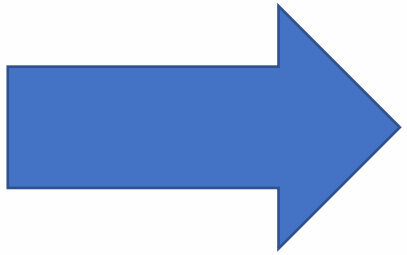
New Student #1

Lab #2

PI #2

Group Members #2

New Student #2



Mentorship Pod

Faculty Mentor:
Different from PI #1,2

Peer Mentors: Senior students from labs #1,2,3…

Mentees: New students from labs #1,2,3…

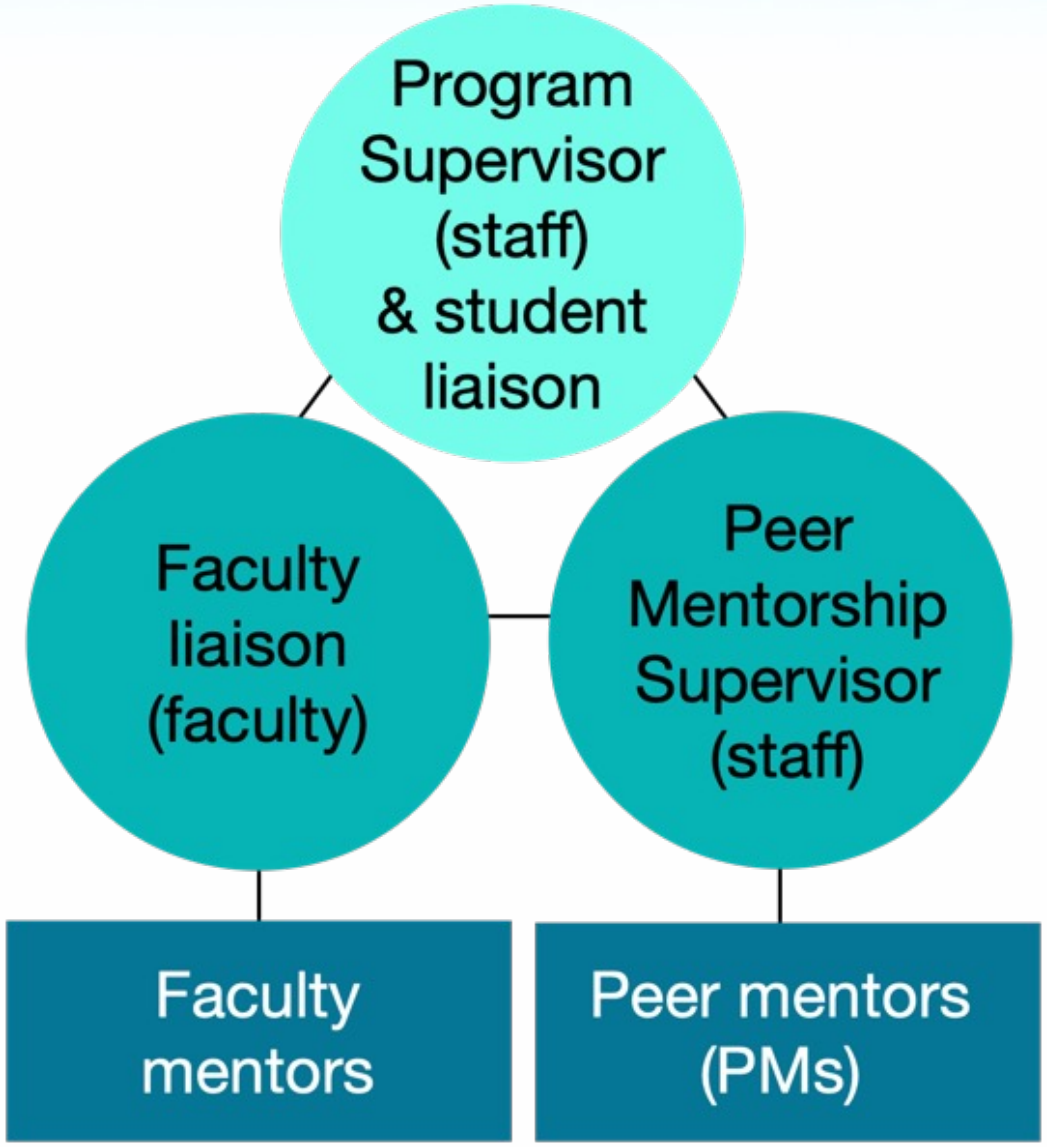
Leadership Team

Theresa Werth – Program Supervisor

Andrea Lehn – Student Liaison

Emily Kierstead – PM Supervisor

Dawn Wendell – Faculty Liaison



8-Week Conversation Curriculum

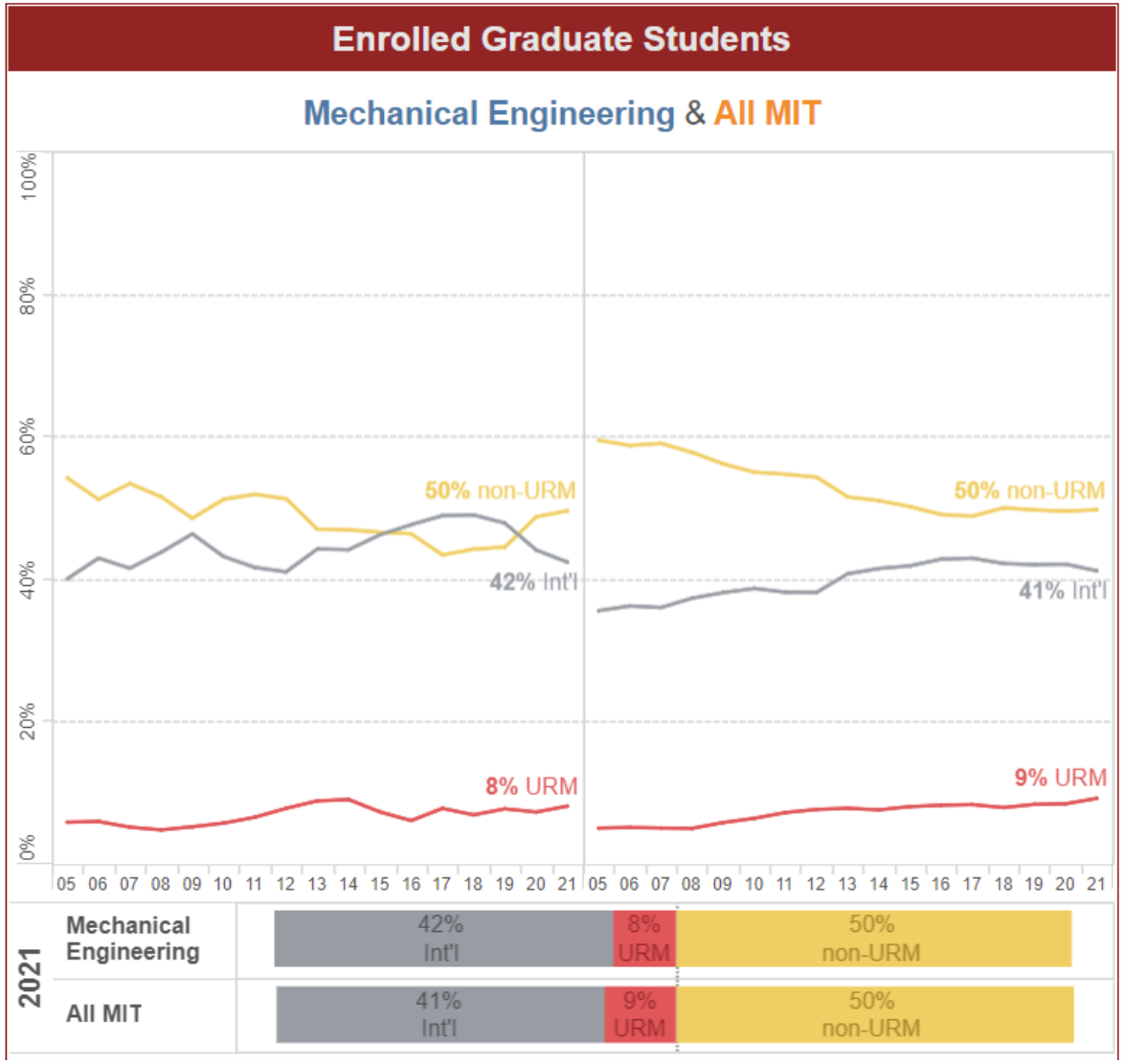
- To facilitate conversation around difficult topics
- To minimize planning required of peer/faculty mentors
- To demystify unknown expectations and nuances of the graduate experience by democratizing access to information and skill building in the following areas:
    - Values & Priorities
    - Career Considerations
    - Planning and Managing Research
    - Classes and Qualifying Exams
    - Health and Wellness
    - The Advisor-Advisee Relationship
    - Perseverance

MechE Graduate Population – **URM**

Flat over the last 15 years

2021 Enrollment - 8% of total

About 8/108 students per year

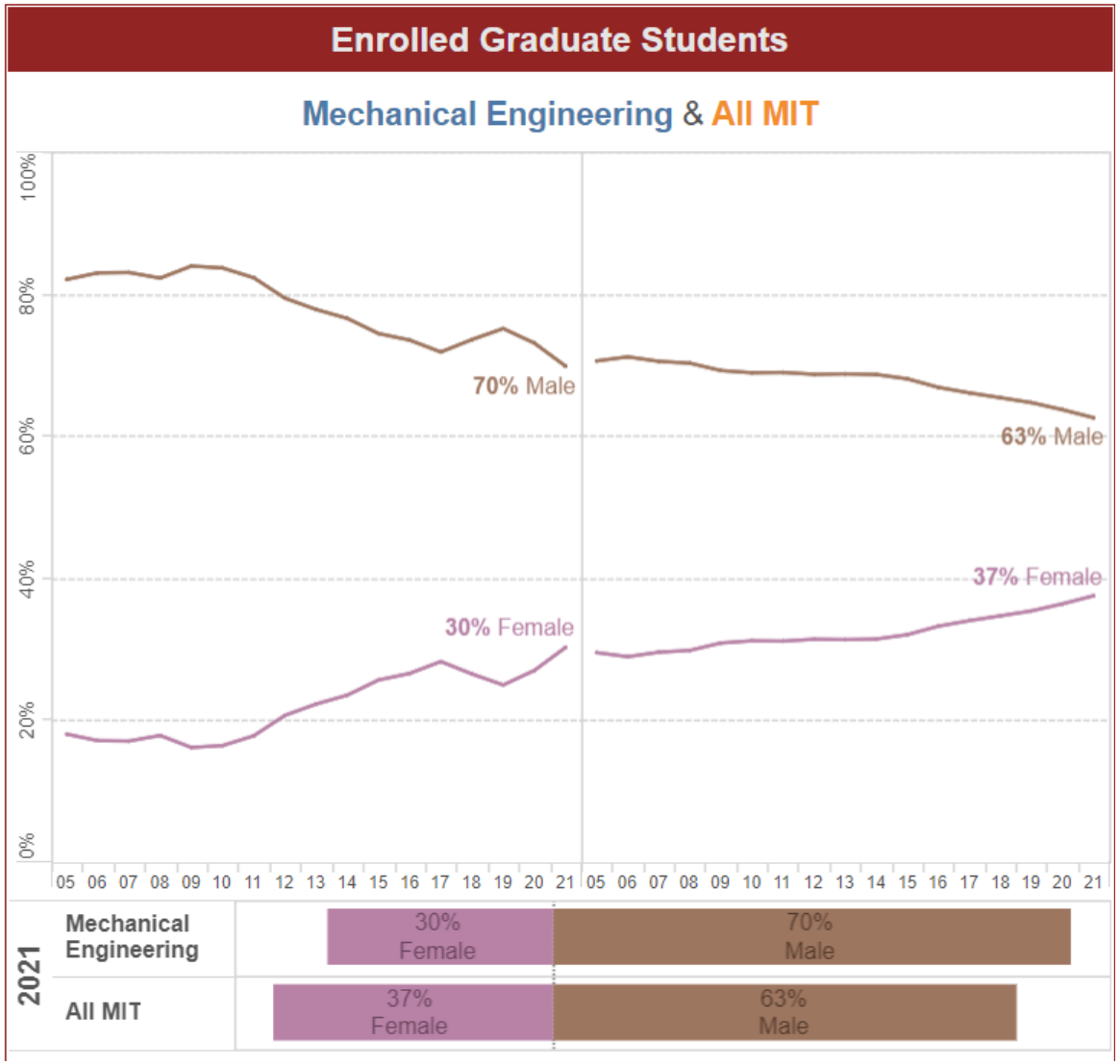


MechE Graduate Population - **Female**

Increased over ten years

2021 Enrollment - 30% of total

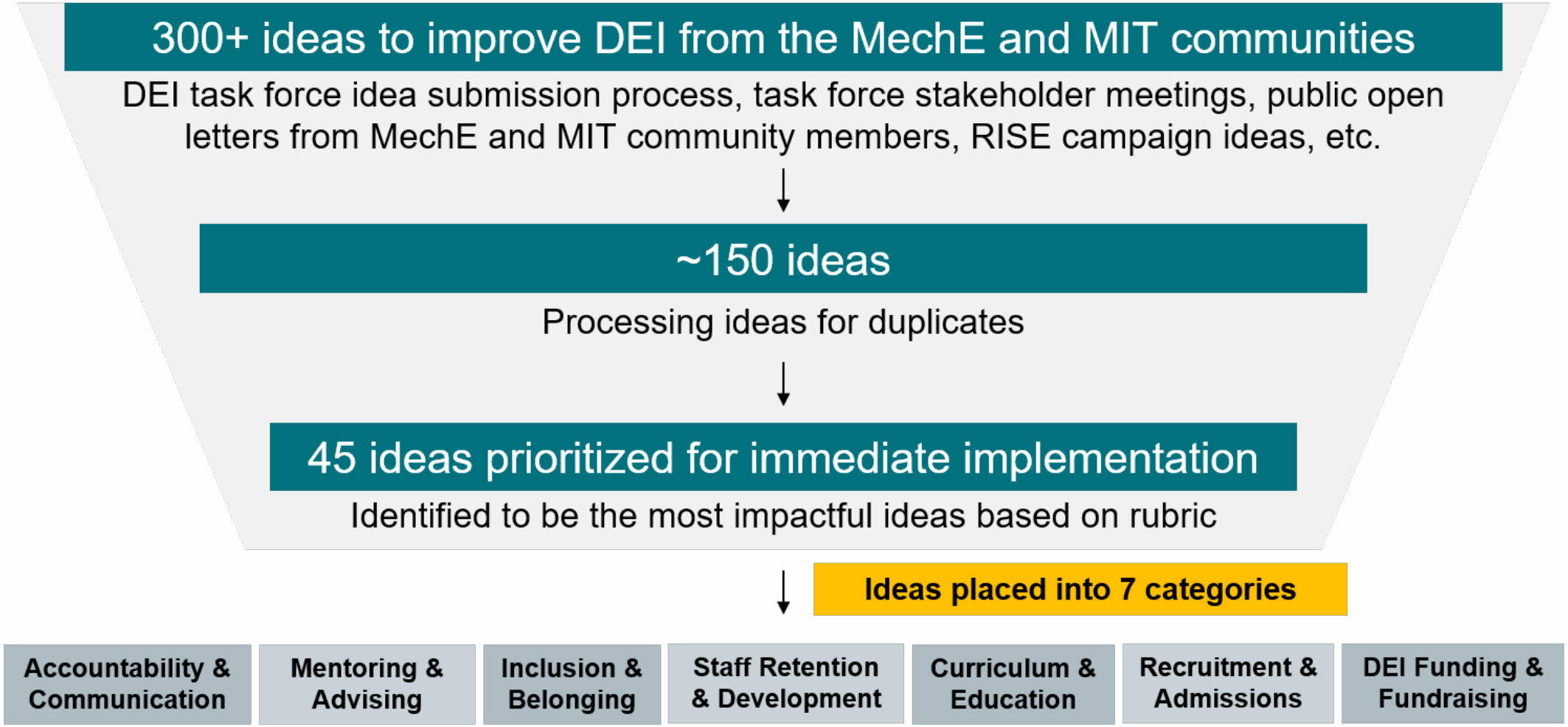
About 32/108 students per year



Going from A-Z

Going from A-Z

Going from A-Z



Going from A-Z

DEI Experts engaged to prioritize ideas to identify those with the highest potential for impact.

Brandi Jones
Vice Dean for
Diversity and Strategic Initiatives
USC - Engineering

Donnie Perkins
Chief Diversity Officer for
Inclusion and Outreach
OSU - Engineering

Addressing the Pipeline

Part of the “pipeline” issue is perceived culture of support received upon admission.

Two initiatives launched parallel to the task force were graduate admissions and ENGAGE.

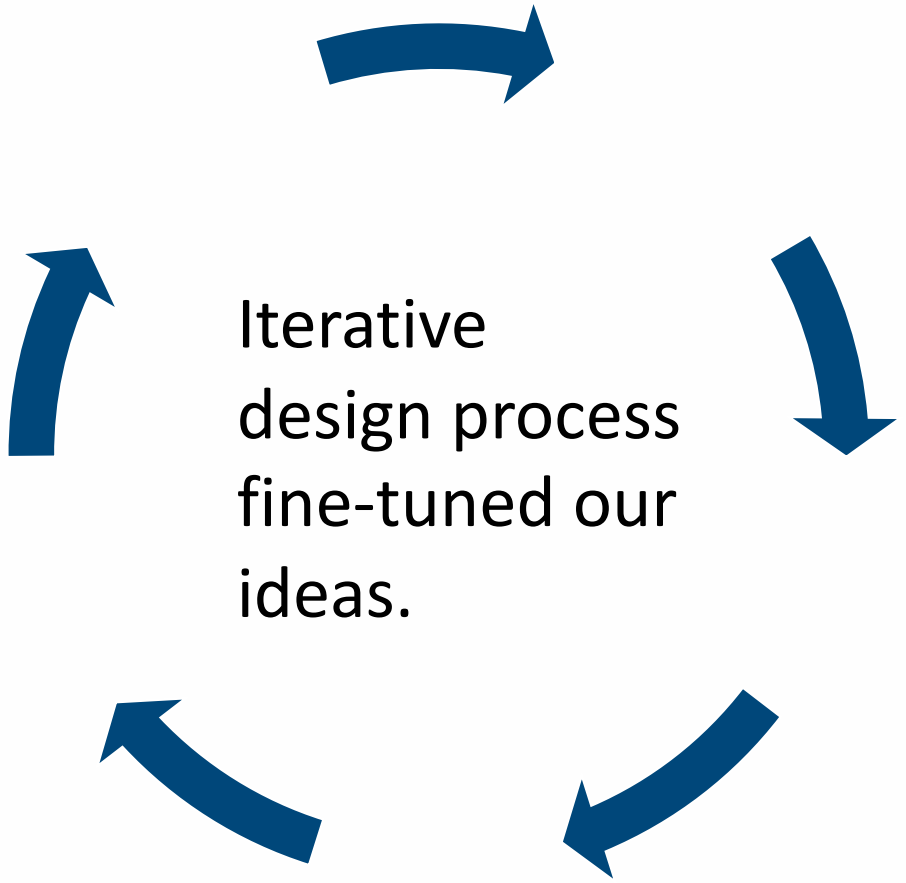
If students see that despite current numbers they will have support hopefully they will enroll.

“The numbers [at this time] in terms of diversity are small. We had to listen to this population and we heard that this is what they need. We asked, ‘can we ensure that the students who ARE here have what they need to succeed and that potential future students know they will be supported?’”

Department Head, Prof. Evelyn Wang

Program Design Stages

1. Brainstorming
2. Requirements
3. Experimentation
4. Evolution



Brainstorming

Brainstorming – Shorter Term

Department Head reaches out for implementable solutions.

Students see possible openness to their ideas, share.

Together, define needs of graduate students to be addressed.

Designate resources for pilot: Staff/faculty time and funding.

Brainstorming: Going from A-B

"If you don't know how to get from A-Z start by going from A-B"

There are many steps to be taken to sustain an updated graduate experience and DEI generally.

For our role, we can help this group of students with these needs.

Along the way, we can create opportunities for others to contribute.

Needs Identified

- **Stronger networks** with peers, experienced students, and faculty outside the research group to increase community

- **Democratization of information** about expectations and resources available at the institute and departmental levels

- **Skill building** to overcome common challenges in graduate school, and prepare students for the ‘hidden curriculum’

Activity – Understanding needs

Discuss the questions below with your neighbor

(5 minutes)

1. What are the mentorship needs for students (or other groups) at your home institution?

2. How do the needs addressed by MechE ENGAGE align with the needs you have identified?

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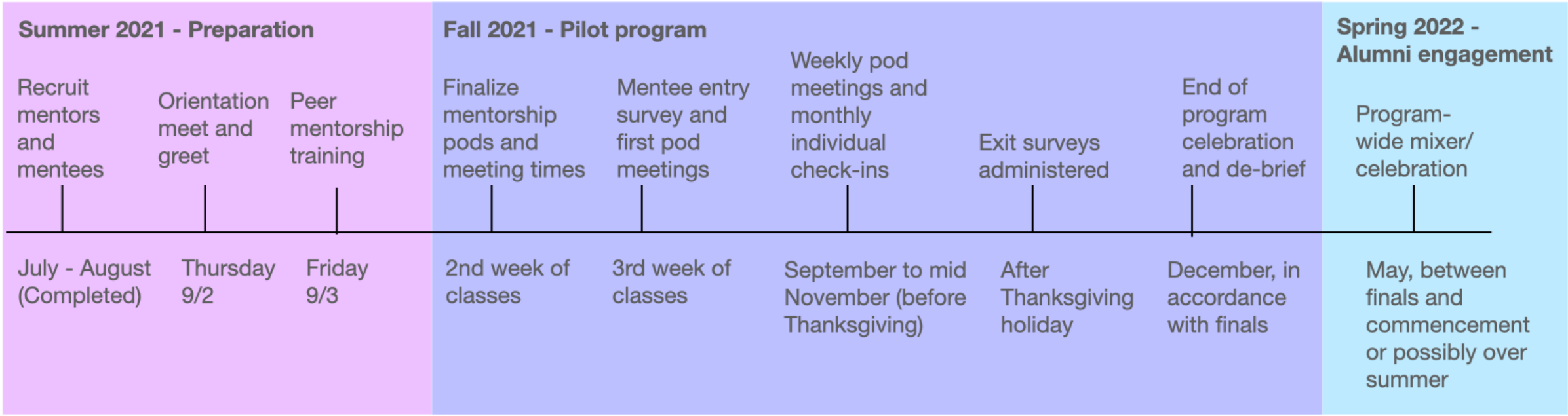
DESIGN REQUIREMENTS

TIMELINE

4 months of development, at 6 months we had our first participants!



Departmental Needs

- Efficient use of faculty/staff time
- Design for sustainability
- Cohesive with academic year
- Aligned with community values: Evidence, Data, Excellence
- Pro-active plan for evaluation

Operational Research

What departmental/campus resources can we leverage/compliment?

How might we identify the financial resources needed?

What logistical, policy, or legal considerations do we need to consider?

Who might be able/interested in contributing to this effort?

Operational Research

Complimenting departmental resources

- Departmental seminar on graduate life
- Alumni of programs with strong mentorship focus
- Justin McKnight (MindHandHeart)

Financial support

- Accepted proposal to "MindHandHeart Innovation Fund" ~$10k
- Confirmed backup as needed from department

Logistics, policy and legality

- Pay for graduate student PMs
- Are PMs Title IX responsible employees?

Identifying who might be willing to contribute

- Identify faculty liaison and PM supervisor to complete senior team
- brainstorm possible mentors

Risk Assessment

“What are we concerned might happen?”

“How can we design our program to minimize confusion?”

Risks identified:

Relying too heavily on students/faculty who have fluctuating bandwidth.

Recruiting the “wrong” faculty

Poorly defined roles and/or unclear expectations

Inconsistencies between mentorship pods on topics

Risk Mitigation

Relying too heavily on students/faculty who have fluctuating bandwidth.	• Dedicated staff for program management
Recruiting the “wrong” faculty	• Reach out to specific faculty vs. “blast email”
Poorly defined roles and/or unclear expectations	• Clear definitions of roles, time commitment
Inconsistencies between mentorship pods on topics	• Defined but flexible conversation curriculum, peer mentor training

Activity – Design Requirements

Discuss the questions below with your neighbor
(5 minutes)

1. What constraints or concerns do you anticipate?

2. How can you account for and preempt these constraints?

3. What would make it easy for individuals to say “YES” to participating?

Activity – Design Requirements

- ✓ Program vision with clear purpose
- ✓ Leadership team
- ✓ Funding
- ✓ Faculty Mentors
- ✓ Peer Mentors
- ✓ Mentees

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EXPERIMENTATION

Current Program Structure and Implementation

Two-Phase Pilot Study

Spring ‘21 – Remote

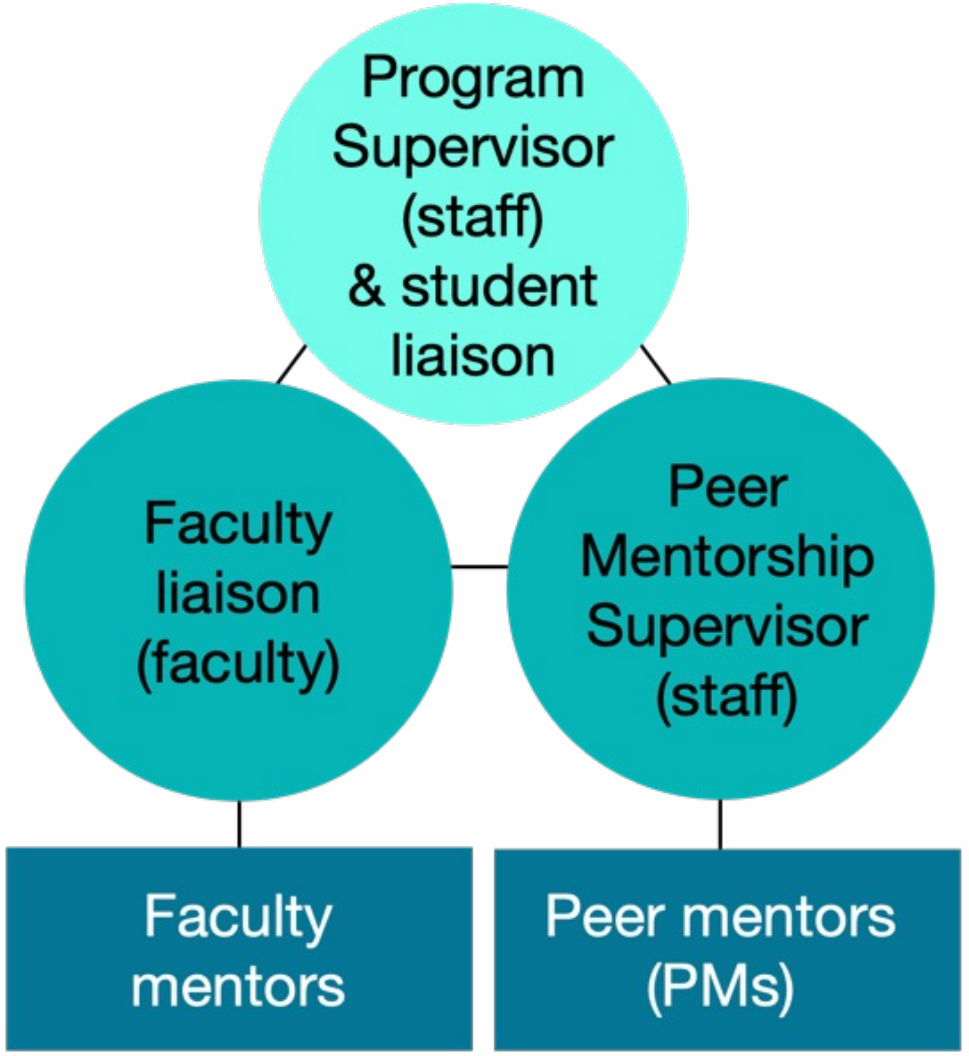
2 Pods – 9 Mentees

Fall ‘21 – In-Person

4 Pods – 20 Mentees

Senior Leadership Team

- Many hands make light work
- Variety of experience and roles
- Continuity if someone is overloaded
- Peers for faculty and students to speak with
- CLEAR roles, responsibilities, time commitments



Senior Leadership Team

Program Supervisor

- ❑ Organizes team meetings and agendas
- ❑ Sets timelines and deliverables
- ❑ Connects team members with resources
- ❑ Negotiates departmental resources
- ❑ Coordinates with other departmental offices
- ❑ Administers surveys

Senior Leadership Team

Peer Mentor Supervisor

- ❑ Recruits, interviews and trains peer mentors
- ❑ Point of contact for resources and questions
- ❑ Regular check-ins
- ❑ Financial support for reimbursements/ordering
- ❑ Raising Peer Mentor concerns to group

Senior Leadership Team

Faculty Liaison

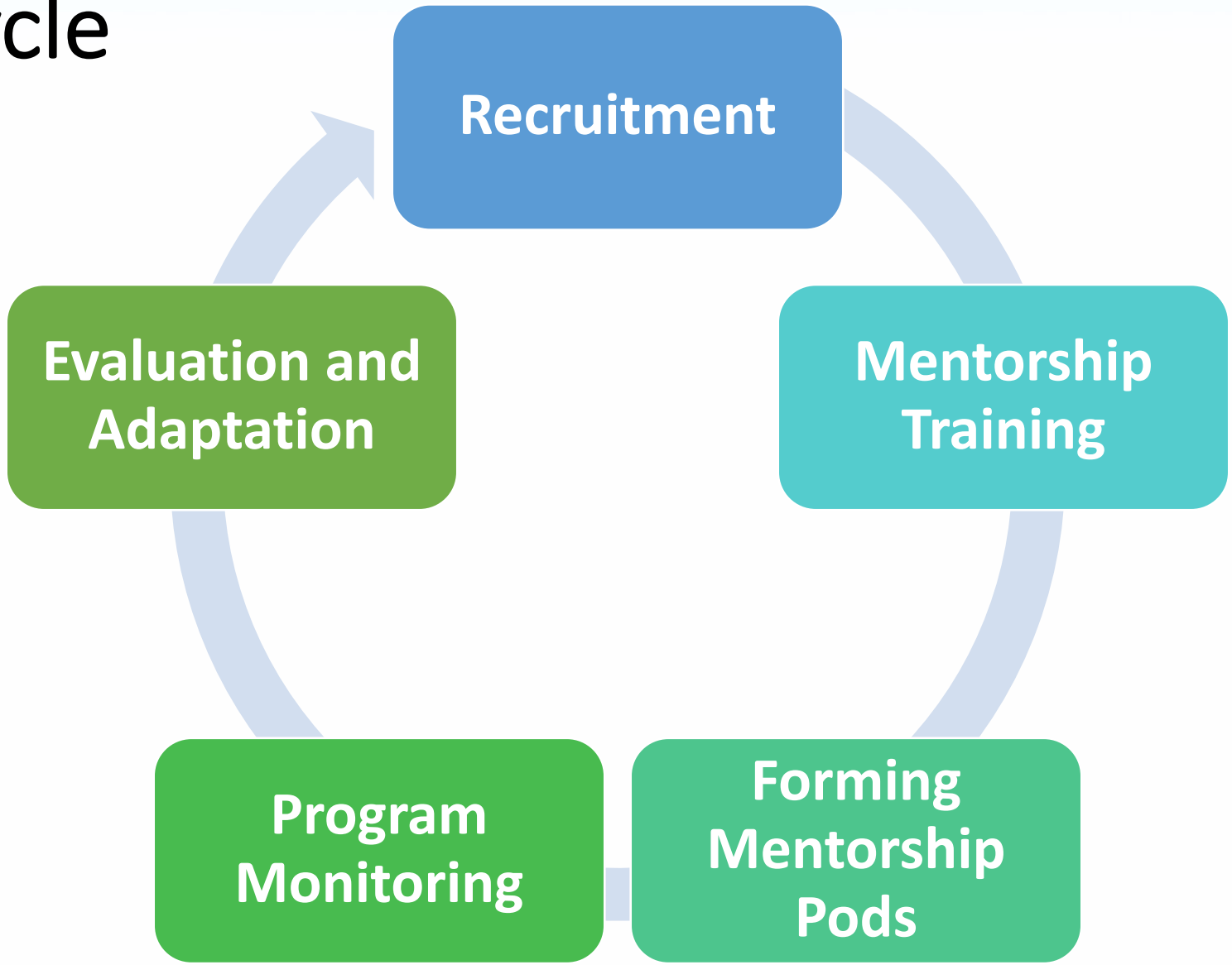
- ❑ Recruits and trains faculty mentors
- ❑ Regular check-ins
- ❑ Raises faculty concerns to the group
- ❑ Advises on program design to meet faculty needs

Senior Leadership Team

Student Liaison

- ❑ Advises on mentee recruitment
- ❑ Represents mentees' interests
- ❑ Regular check-ins
- ❑ Point of contact for student concerns
- ❑ Assists program supervisor with logistics

Program Cycle



Recruitment

CLEAR time commitment, expectations and opportunities communicated.

MAKE IT EASY TO SAY YES!

All work is compensated:

For students: Additional stipend of $1000

For staff: Adjustments to fit within role/time available

Peer Mentorship Supervisor (staff): 10-12 hrs/week
Directly oversees 4-6 graduate students hired as peer mentors. Responsibilities include coordinating PM finances including stipends and reimbursements, making sure PMs are fulfilling training and mentorship duties, and organizing PM training over IAP with the support of the senior leadership team.

Faculty liaison: 2-3 hrs/month
Primary responsibility is relaying faculty concerns to the senior leadership team and representing the faculty interest. Expectation is to attend senior leadership team meetings (2-4 times/semester) and to reach-out to faculty mentors before senior leadership meetings to inquire about any concerns. Faculty liaison can also serve as a faculty mentor.

Student liaison: 6-8 hrs/month
Primary responsibility is representing the mentee interest on the senior leadership team and assisting the Program Supervisor with overarching program logistics. Expectation is to be available for monthly meetings with the Program Supervisor and to attend senior leadership team meetings (2-4 times/semester).

Faculty mentors: 4-6 hrs in February/March/Early April, tapering down to 1-3 hrs in Late April/May
Peer and faculty mentors are the backbone of MechE Engage. One faculty member will join with two PMs to create a mentor team. Mentor teams will be matched with groups of 4-5 students to create a mentorship pod. Faculty mentors should expect to touch base with their PMs once a month and they should expect to engage in small group mentorship activities once a month, with higher meeting frequency likely in the beginning of the program to build a relationship with your mentees. Participation in a welcome event will be required.

Peer mentors: 12 hrs in February/March, tapering down to 3-6 hrs in April/May (cool name: Senior MechE ENGAGErs, ENGAGErs,
Peer and faculty mentors are the backbone of MechE Engage. Two PMs will join with one faculty mentor to create a mentor team. Each team will be matched with a group of 4-5 students to create a mentorship pod. Throughout the semester, PMs are responsible for reaching out to mentees on a monthly basis and will have a budget for one-on-one and/or small group outings as the group sees fit. PMs will work closely with each other and with their faculty mentor to ensure they are providing adequate support to each mentee. **PMs are required to complete a three-day training over IAP.**

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Details to include:

- Estimated hours per week/month
- Responsibilities
- Meetings anticipated
- Time of year they are active

Time Commitment - Confirming

Role	Estimated Time Commitment	Actual Time Commitment
Program Supervisor	12 hrs/week	2-3 hrs/week
Peer Mentor Supervisor	10-12 hrs/week	Beginning 6 Later 1hr/week
Faculty Liaison	2-3 hrs/month	2-3/month
Student Liaison	6-8 hrs/month	12/month (J, F) 4/month (M,A,M) Plan for training, one full week (Aug)
Faculty Mentors	4-5 hrs/month	4-5 hrs/month
Peer Mentors	12 hrs/month	4-6 hrs/month (could increase if 1-1 meetings increase)

All estimates were accurate or higher than necessary. Department head was keen to ensure these commitments.

Recruitment- Approach by position

Program Supervisor and Peer Mentor Supervisor

- Nominated by department head

Faculty Advisors

- Reached out to specific faculty we knew would be good

Peer Mentors

- Solicitation sent to all graduate students. Targeted outreach to highly aligned students (mentors from other programs etc.) Interviews conducted.

Student Mentees

-Direct advertisement to all women and URM incoming students; other students can enroll but not targeted in marketing.

Peer Mentor Training

"It was great! The peer mentors were really well prepared so I could 'just show up and mentor.'"

Prof. Maria Yang

Faculty Mentor

- Give mentors confidence in skills and access to resources
- Guided discussions with institute staff who work full-time student support roles
- Clear expectations of meetings and organization
- Full understanding of conversation curriculum

Creating Mentorship Pods

Have participants provide times they are available weekly (faculty mentors, peer mentors, and mentees).

Align availability and applicability; consider:

- No overlap between faculty and students' advisor
- Maximize mixing of students from different labs
- Align research area
- Affinity

Program Monitoring

- ❑ Ongoing check ins with Peer and Faculty Mentors (separately)
- ❑ Include open questions on surveys asking if mentees are comfortable
- ❑ Participants explicitly told they could reach out to the leadership team if there were concerns in their pod

Once “pod” assignments released, program ran itself

Evaluation

How do we know this program meets the needs it set out to address?

Include qualitative and quantitative assessment

Correlate with identified needs:

- Did their NETWORKS improve?
- Do they have more INFORMATION?
- Do they feel confident in the SKILLS shared?

Use the feedback to guide iteration, increase buy-in, expand resources.

Spring Pilot Data

Spring Pilot Data

Survey data showed:

- 100% Strongly agreed that MechE ENGAGE:
  - Improved their network within the department
  - Helped them feel more integrated with the MechE Community
  - Helped them feel more prepared for their graduate studies

Mentees did not know their faculty or peer mentors well prior to MechE ENGAGE and felt their pods members were relatable and had relevant experience to share.

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EVOLUTION

How did the program change after first iteration?

Program Updates from Data

- Quantitative assessment justified continuation of program support
- Qualitative assessment improved recruitment materials and provided a personal dimension
- Added program wide activities to increase networking between pods
- Re-organization of conversation curriculum topics to start with more “neutral” topics.

“Most of the questions were along the lines of ‘Is this normal?’ and ‘Is this OK?” confirmed that building an understanding of norms was key.

What feedback do you need?

Some things are difficulty to quantify, use your intuition.

Define success for you and your community; ask questions to access

Iterative design builds confidence operating at the boundaries of the known and the unknown; improving as you go

Experiment and listen to your community!

Channels of Influence

MechE ENGAGE as designed grew up in a highly rational, data driven environment.

Organizations can also emphasize one or more of the following:

1. Interest Based Persuasion
2. Authority
3. Politics
4. Rationality
5. Inspiration and Emotion
6. Relationships

Source: The Art of Woo: Using Strategic Persuasion to Sell Your Ideas, G. Richard Shell and Mario Moussa, 2008

Highly recommended!

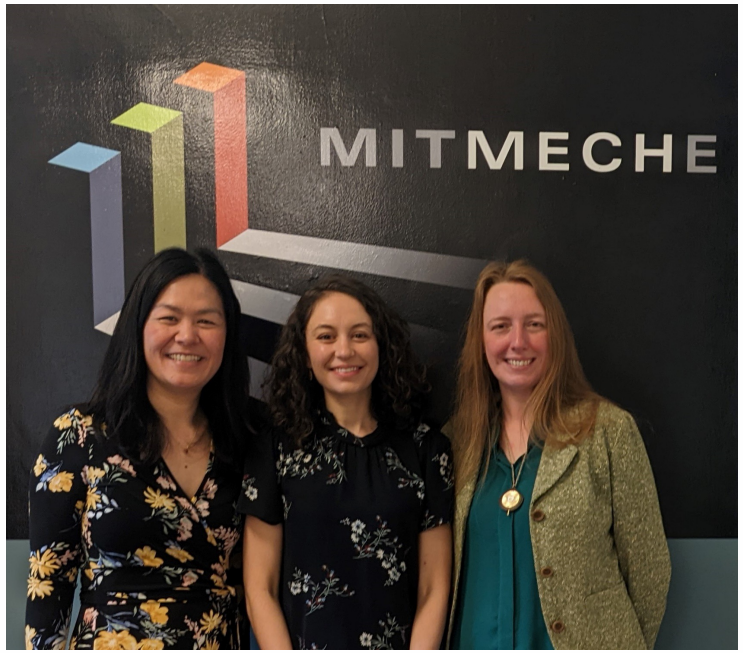
SESSION EVALUATION

Please evaluate this session using the NCORE Conference App:

You may find this session by index #2219.

Thank you for your feedback. It is a valuable resource to our presenters and shapes future programming. Enjoy the rest of your sessions!

Acknowledgements



Prof. Evelyn Wang, Department Head, MIT MechE
Jason McKnight, MindHandHeart
Dr. Gaurav Jashnani, GradSupport
Dr. Dawn Wendell – Faculty Liaison, MIT MechE
Emily Kierstead – PM Supervisor, MIT MechE
2020-2021 MEGAWomen Executive Team

Spring 2021 – Pilot #1
Prof. Cullen Buie and Prof. Maria Yang

PMs – Emily Hanhauser, Ashley Hartwell, Alina LaPotin and Yi Jenny Wang

Spring 2022 – Pilot #2
Prof. Cullen Buie, Prof. Sili Deng, Prof. Mathias Kolle, and Prof. Warren Seering

PMs – April Anlage, Rima Das, Corbin Foucart, Alina LaPotin, Swathi Manda, Crystal Owens, Yi Jenny Wang, and Chuck Xia

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Thank You!

Equip new graduate students with skills, knowledge and confidence to navigate the challenges of graduate study at MIT through a single semester, semi-guided mentorship program

Build meaningful relationships among new graduate students, student peer mentors, and faculty mentors in small group and individual settings

Integrate new graduate students into the MechE community and provide a foundational support network, which will grow with the mentee over the course of graduate study and beyond

MechE ENGAGE NCORE Materials

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MechE ENGAGE