Inclusive Teaching in Engineering

Activities

**Objectives:**
After attending this session, you should be able to:

1. Define **inclusive teaching** and describe its relevance in the engineering context
2. Examine **classroom scenarios** and identify conditions that foster inclusion
3. Identify inclusive **teaching practices** that you could use in your teaching context

**Things to try in the next few weeks:**
- Revisit the continuum of classroom climate sheet regularly. Are there ways to alter your discussion, lab, or office hours to intentionally support inclusion?
- Implement one inclusive teaching practice you indicated you would like to try in your teaching each week.
- Contact an Engineering Teaching Consultant (ETC) about how to implement inclusive teaching practices in your course.

**Plenary Resources:**  
[bit.ly/F19orientation]

**Session Resources:**  
[bit.ly/F19orientation]

**Workshops/Seminars:**  
[bit.ly/F19seminars]

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Center for Research on Learning and Teaching in Engineering  
crte.engin.umich.edu
Sample Discussion Guidelines

The following guidelines or ‘ground rules’ could be shared with students on a syllabus, or used to start a conversation with students about expectations for participation and interaction that will foster an environment of mutual respect and collaborative inquiry. Many instructors also find it useful to engage students in generating guidelines as a class.

- **Listen respectfully.**
  Don’t interrupt, engage in private conversations, or turn to technology while others are speaking. Use attentive, courteous body language.

- **Share responsibility for including everyone in the discussion.** If you tend to have a lot of say, make sure you’re leaving enough space for others to contribute. If you tend to stay quiet, challenge yourself to share ideas so others can learn from you.

- **Take pairwork or small group work seriously.**
  Remember that your peers’ learning partly depends upon your engagement.

- **Understand that there are different approaches to solving problems.**
  If you are uncertain about someone else’s approach, ask a question to explore areas of uncertainty. Listen respectfully to how and why the approach could work.

- **Be careful about how you use humor or irony in class.**
  Keep in mind that we don’t all find the same things funny.

- **Make an effort to get to know other students.**
  Introduce yourself to students sitting near you. Refer to your classmates by name and make eye contact with other students.

- **Understand that your words have effects on others.**
  Hold each other accountable when language excludes or devalues, even inadvertently: this is a way we can grow as a community.

To create your own guidelines answer the following questions:
- What are some of the behaviors you want to encourage in your students?
- What are some of the behaviors you want to discourage?

Or you may want your students to design their own guidelines:
- What have you learned about what’s appropriate classroom behavior?
- When interacting with other students, what kinds of behaviors help you to learn most effectively?

The Program on Intergroup Relations, University of Michigan
Inclusive Teaching in Engineering

Activity 1: Think and write

How would you define “inclusive teaching”?

Michigan Engineering Values
http://strategicvision.engin.umich.edu/our-vision/our-values

In pursuing our vision and mission, members of the University of Michigan College of Engineering community will value:

- **Leadership and excellence**: True to being “Leaders and Best,” we do not settle. We forge paths that inspire others, and push relentlessly for quality and preeminence in all we do.
- **Creativity, innovation and daring**: “We’ve always done it this way” is never how we do it. We seek to improve the quality of life. Bold thinking and non-traditional action are among the tools we rely on to solve problems and create opportunities.
- **Diversity, equity and social impact**: The best mix of talent achieves the greatest outcomes. People with different skills, backgrounds, identities and perspectives are necessary for us to realize our vision. Opportunities are created for all, and where barriers exist, we close the gaps. Every member of our community gets to be heard, should be involved and must be empowered to achieve to their full potential. We serve the common good.
- **Collegiality and collaboration**: Camaraderie is a strength. When we disagree, we remain civil. We succeed in facing complex challenges by working together — across the lab, classroom or globe. Teamwork is fundamental to how we operate. We cannot fulfill our potential unless we are combining our strengths. Our individual abilities are joined to accomplish a united vision and mission.
- **Transparency and trustworthiness**: A consistent respect for truth breeds good relationships. We depend on open and honest sharing of data, facts and individual perspectives. In difficult situations, where discretion is required or conversations are sensitive, we acknowledge the limits of what can be shared. Trust must be preserved.
Inclusive Teaching at the University of Michigan

Inclusive teaching involves deliberately cultivating a learning environment where all students are treated equitably, have equal access to learning, and feel valued and supported in their learning. Such teaching attends to student identities and seeks to change the ways systemic inequities shape dynamics in teaching-learning spaces, affect individuals’ experiences of those spaces, and influence course and curriculum design.

Some key aspects of this definition to note:

- This definition is relevant in every discipline, whatever your content.
- Inclusive teaching requires intentional practice over time.
- Inclusive teaching does not describe any particular pedagogical approach but names a foundational intention that shapes your approach.
- Inclusive teaching ideally stems from instructor awareness about the ways systemic inequities (such as sexism, racism, ableism, heterosexism, and economic inequality) influence student access to and learning experiences within specific disciplines and institutions as well as higher education more generally.

Principles of Inclusive Teaching

TRANSPARENCY
- Clearly communicating about norms, expectations, evaluation criteria

ACADEMIC BELONGING
- Cultivating students’ sense of connection to the discipline + scholarly and professional communities

INCLUSIVE TEACHING

STRUCTURED INTERACTIONS
- Providing or eliciting goals, protocols, processes to make sure group interactions don’t default to patterns of privileging already-privileged voices or otherwise replicating systemic inequities

AFFIRMATION OF DIFFERENCE
- Recognizing that students bring diverse identities, strengths, and needs to the learning environment
Activity 2: Continuum of Classroom Climate
Individually review the following scenarios and decide how you would classify each classroom experience. Be ready to share your thinking with a partner.

1. During discussion, the instructor says, “Ok, everyone. Get out your laptops so you can look at this code-- and I don’t want to see anyone shopping for shoes.”
   - Explicitly Marginalizing

2. The instructor asks a question of the whole group, then says, “I’m going to give you all a few minutes to think about how you’d respond. Please write down some notes so we can hear your ideas later.”
   - Explicitly Marginalizing

3. The instructor asks students to form their own groups to solve a difficult in-class problem. The instructor also walks around the room and finds groups for any students that are not in a group.
   - Explicitly Marginalizing

4. When using examples to illustrate course terms or concepts, the instructor only chooses real world examples from sports and science fiction movies.
   - Explicitly Marginalizing

5. A student makes a disparaging comment about a political figure, and the instructor ignores it and continues with the lesson.
   - Explicitly Marginalizing

6. While checking on how a team is progressing during the lab, the instructor asks questions to the whole group and addresses follow up questions only with the student who answered the initial question.
   - Explicitly Marginalizing
Activity 3: Brainstorm Inclusive Teaching Practices

In groups of 4, brainstorm teaching strategies *(including words or phrases the instructor could use)* that would shift any scenarios your group identified as explicitly or implicitly marginalizing to be more inclusive.

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Teaching Strategies <em>(including words or phrases the instructor could use)</em></th>
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</tr>
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</table>
Activity 4: Inclusive Teaching Strategies Reflection

Mark each of the strategies on pages 7-8 using the following symbols:

✓ = Feel comfortable using this strategy
~ = Would like to try, but need more information
X = Would not like to use this strategy

Transparency

Clearly communicating about norms, expectations, evaluation criteria

- Explicitly communicate the purpose, task, and grading criteria for each assignment.
- Dedicate time in class for students to discuss and ask questions about assignments.
- Explain the learning objectives of the activities you use class time for (e.g., solving problems, mini-lectures describing equipment/software, providing feedback to a peers’ work).
- Explain the meaning and purpose of office hours when encouraging students to attend.
- Share your preferences for how students should communicate with you, whether to ask questions or talk more broadly about course material: what kind of questions/topics are best for office hours, which are best for email, what would you like brought up in the full class, etc.
- Offer guidance on how students ought to allocate time on assignments and prioritize various out-of-class tasks.
- Communicate (on a syllabus and/or in person with your class) your goal of creating an equitable and inclusive learning environment.

Academic Belonging

Cultivating students’ sense of connection to the class, discipline + scholarly and professional communities

- Learn and use students’ names and pronouns; learn what they choose to be called (which may differ from a name on a roster) and how it’s pronounced.
- Encourage students to learn and use one another’s names, correctly pronounced.
- Use icebreakers regularly so students can learn about one another.
- Communicate high expectations and your belief that all students can succeed.
- Encourage students to visit office hours, and use that time to ask about their experiences with course topics as well as their interests outside the class.
- Allow for productive risk and failure. Make it known that struggle and challenge are important parts of the learning process, not signs of student deficiency.
- Share stories about your own challenges mastering difficult material.
- Help students connect their prior knowledge to new learning (e.g., before introducing a new topic ask students individually to reflect on what they already know about the topic).
- Use diverse examples to illustrate concepts, drawing upon a range of domains of information.
- Avoid referencing pop culture without providing sufficient orienting context. (This would include making clear whether you’re citing a movie, comic book, band name, etc. so students can learn more if they’re not familiar with the reference.)
- Acknowledge campus events or incidents that may be creating barriers to students’ sense of being welcomed and valued; acknowledge the differential effects incidents have on different students.
- Create structured opportunities for students to provide feedback on their experience of the learning environment and contribute ideas for improving it.
## Structured Interactions

*Providing or eliciting goals, protocols, processes to make sure group interactions don’t default to patterns of privileging already-privileged voices or otherwise replicating systemic inequities*

- Establish guidelines, ground rules, or community agreements for class participation.
- Reflect upon those guidelines with students at strategic points throughout the term.
- Structure discussions to include a range of voices: e.g., take a queue, ask to hear from those who have not spoken, wait until several hands are raised to call on anyone, use think-pair-share activities.
- In class, have students work on brief, well-defined tasks (with a timeline and particular goals/outcomes) in pairs or small groups.
- In class, explain the value of collaboration for learning. Speak of students’ diverse perspectives as an asset.
- Provide students opportunities to reflect on what they learned through collaborative activities.
- When possible, assign student groups/teams or provide criteria for student-formed groups/teams that help leverage diversity and avoid isolating students from underrepresented identities.
- At the beginning of group or team projects, create time and a process for students to discuss their respective strengths, personal learning goals, anticipated contributions, etc.
- During long-term group or team projects, provide a process for students to reflect upon the team work/dynamics and provide constructive feedback to one another.
- In presentations of group projects, guide students to share speaking responsibilities equitably.

## Affirmation of Difference

*Recognizing that students bring diverse identities, strengths, and needs to the learning environment*

- Assess students’ prior knowledge about your field and topics to align instruction with their needs.
- Invite students to identify examples that illustrate course concepts.
- Create opportunities for students to explain their different approaches to the work of the course (solving problems, choosing paper topics, etc.).
- Deliberately choose course materials and activities with a range of student physical abilities in mind.
- Deliberately choose course materials with students’ range of financial resources in mind.
- Welcome requests for documented accommodations as a chance to include everyone more fully in learning.
- Communicate concern for students’ well-being, and share information about campus resources (e.g., Counseling & Psychological Services, Sexual Assault Prevention & Awareness Center, Services for Students with Disabilities).
- Ask students for concrete observations about content (e.g., simply describe a figure, graph or diagram) before moving to analytical questions. This can provide everyone a common starting point, highlight students’ different perspectives/approaches, and model analytical processes you want to teach.
- Present course material in a variety of modalities (readings, diagrams, lectures, podcasts) rather than relying on one mode of engagement.
- Try to accompany verbal instructions with a written corollary. (Multiple modes can be helpful to students with processing disabilities as well as non-native English speakers.)
Responding to Microaggressions in Class: Some Options

When reviewing the options shown below, think about the following:

- What specific language would you use if you pursued this strategy?
- What are some potential challenges and benefits of this approach?

1. Options when a student’s contribution devalues, marginalizes, or tokenizes others

- Directly respond to student comment as problematic (e.g., identify specific words or phrases and then explain why you found them disrespectful or someone else might).
- Invite the student to clarify or further explain.
- Open up a critical conversation with the whole class.
- Follow up with specific students after class.
- Follow up with all students (via email, or in the next class).

Some language that might be helpful

These ideas come from conversations with U-M faculty about responding to student comments in class that might exclude, devalue, or marginalize other students or perspectives. Depending on what you’re responding to, as well as how much time you want to spend, steps could include:

- **Clarify:** “I heard you say/suggest __________. Did I understand that correctly?”
- **Validate the useful elements of a contribution:** “Thank you for raising a common perspective…” “I can hear you’re really grappling with this complex idea…” “You’ve raised an idea that’s important for all of us to consider, and we’ll do that — but first I briefly want to…”
- **Give the benefit of the doubt:** “I doubt this is what you intended, but…” “You may not realize how this sounded…” “I hear that you’re primarily making a joke, and yet…”
- **Refer to the class discussion guidelines:** “This is a good occasion to remind everyone about guidelines discussion. We want to be careful about how we use humor or irony in class. Not only do we not all find all jokes funny, but some ‘jokes’ actually devalue and demean others.”

2. Options when a student identifies your choices or language as problematic

- Validate the student’s response (e.g., thank them, apologize for the problem they have identified, or recognize why the student might have responded as they did).
- Confirm that you understand the critique (e.g., restate in your own words, or invite the student to clarify or further explain).
- Explain your understanding of why what you said/shared was problematic and how you’ll avoid it in future.
- Alternatively: Clarify a misunderstanding on the student’s part. Use the opportunity to assess all students’ understanding.
- Open up a critical conversation with the whole class.
- Follow up after class -- with specific students or the whole group.

Some language that might be helpful

- **Acknowledge the impact of harm (without focusing on your intentions).** “I’m sorry that I caused offense and hurtful feelings. At the time, I was not thinking about the potential effects of my actions and for that I apologize. I have learned from my mistake and I will strive to be better than that—for myself, my students, and my colleagues”1

Content adapted from CRLT

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Selected scholarship pertaining to inclusive teaching


Kardia, D., & Saunders, S. Creating Inclusive College Classrooms. [http://crlt.umich.edu/gsis/p3_1](http://crlt.umich.edu/gsis/p3_1)


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For an online version of the research basis for inclusive teaching with live links to much of this research, visit:

[http://crlt.umich.edu/research-basis-inclusive-teaching](http://crlt.umich.edu/research-basis-inclusive-teaching)