



Guiding Technical Projects to Success through Mentorship

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Agenda

- When Might you be Asked to Mentor a Team?
- What Role does a Mentor have on a Technical Team?
- Tips for Mentoring Technical Teams
- Case Studies!
- Mentoring Opportunities with EPICS in IEEE
- IEEE Resources
- Questions!

Who is joining us today?

EPICS
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When might you be asked to mentor a team?

Situations that may call for technical team mentors

- **Capstone / Senior Design**
 - Companies sponsoring projects may want a “client contact”
 - Some schools allow alumni to mentor student projects in addition to faculty mentorship
- **Student Competition Teams**
 - Different organization have formal and/or informal mentor roles
 - IEEE and EPICS, EWB, Formula SAE, FIRST and VEX robotics, etc.
- **Internship and/or Co-op Supervision**
 - Mentor teams of students or individual students who are a part of a larger team depending on company format
- **Industry Team or Platform Transitions**
 - Within a company, you may need to mentor a separate team on a specific product, software, or project, especially if your team worked with it earlier than other teams.

What role does a mentor have on a technical team?

How does a Mentor support a Technical Team?

- **Motivator**

- Support the team through the challenges of the project
- Development of student initiative and student leadership
- Encourage the team to take ownership of what they were able to create and of the impact that it is having for their clients or communities

- **Resource**

- For technical support
- Navigating "Real-life engineering" challenges
- Connecting the team to other people, companies, groups, etc. with similar interests

- **Guide**

- Guide student teams, not do the project nor lead the project.
- Make sure the students have room to grow as part of the project.



Things a mentor should not be doing:

Leading the Project

- A team lead should be fully committed to the team and project success. Usually a mentor has a more passive and as-needed role.

Significant technical contributions

- You are technical support, not a technical contributor

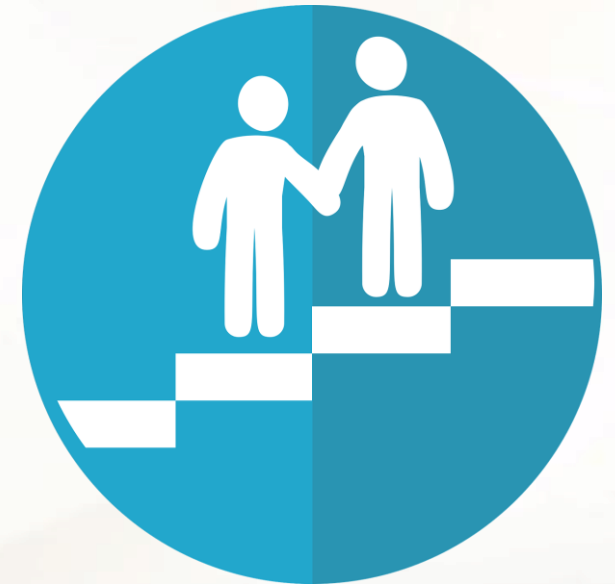
Ensuring project success as a priority over team learning

- Team members will make mistakes during the process. You should let them make the small ones, but point out potential major flaws to avoid project failures.

Tips for Mentoring Technical Teams

How do I mentor without being the project lead/manager?

- Ask open-ended questions, rather than yes/no.
- Actively listen to the team.
- Check in to see if all members of the team are actively engaged. Is the team well-functioning, or dysfunctional?
- Be a proactive resource and connector, sometimes students don't see the broader picture or community



Tips for a stronger mentoring relationship

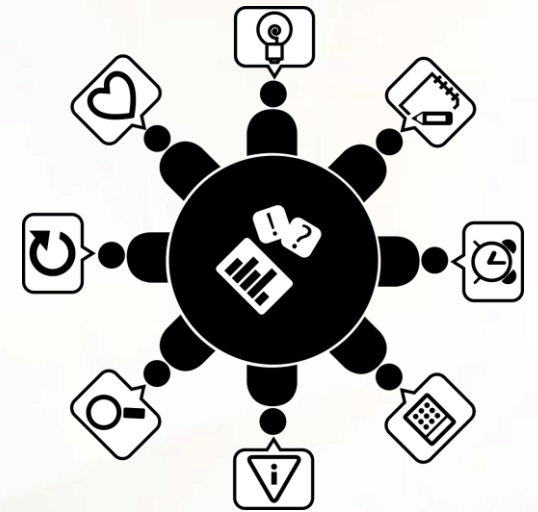
- You should likely plan to initiate the mentoring relationship. Often student teams will not send updates unless requested. Consider setting up a standing meeting, or a calendar reminder to check-in on the team.
- If teams seem to be slowing down or not meeting their milestones, it is okay to meet with them to discuss why. Possible challenges may include:
 - Inventory challenges
 - Technical challenges
 - Timing of the student team
 - Lack of responsiveness with the partners and/or clients
- Once you identify a reason, you can work with them to brainstorm solutions.



Supporting all of our students

Because diverse teams create better solutions

- It starts with being aware of our biases. Try exploring yours at: <https://implicit.harvard.edu/implicit/takeatest.html>
- One common type of bias is affinity bias- preferring people who come from a similar background to us.
- When interacting with team members, pay attention to what type of critiques you give each member. Are you giving similar types of feedback to all students, or do some get technical and others get only non-technical?
- Remember that the interactions you have with the team can influence their perception of their discipline, the profession, and their career choice.



Let's practice

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Case Study #1- The wrong technology

- You are the point of contact for your company's sponsorship of a senior design project. The team of 4 students have been asked to make a new device that can be used to calibrate sensor systems out in the field. On top of just calibration, the team is expected to implement a data transmission protocol to get data from the sensors out in the field to the cloud for constant monitoring. The team was brought on-site to tour the company site, and also brought out to the field to see a recently deployed sensor setup. They started in September, and are expected to deliver a working prototype and documentation by May.
- In the first design review two months into the project, you realize the students are proposing a technology platform that isn't easily compatible with your company's current technology and security protocols. You aren't sure how they got so invested in this technology, since it was never brought up or suggested by you or anyone else at the company when meeting with the students in the last two months.
- What do you do?

Case Study #1- The wrong technology (follow-ups)

- After meeting with the team, you learn:
 - The technology chosen was suggested by the team lead who had been very active in leading the team
 - The team lead has familiarity with the technology from an elective class they took last year, but none of the other team members are familiar with it.
 - The other team members seem quiet and tend to let the team lead do all of the talking regarding the technology choice.
 - No other technology options or platforms were explored outside of this one
- Now, What do you do?

Case Study #2- An open-ended problem

- You are mentoring a student team that was awarded funding for an EPICS in IEEE project. The team is proposing to use a drone to collect water quality data in and around a manufacturing site close to a local village with a river and marsh system as the main water source. The team's initial budget proposed a specific drone model and various sensors that would be added to it. However, the team is realizing the drone doesn't fly as well once all of the hardware was added to it. They don't have enough funding to buy a new drone, and they are struggling with deciding which sensors to remove.
- What questions would you ask the team to help them move forward in their design?

Mentoring Opportunities with EPICS in IEEE

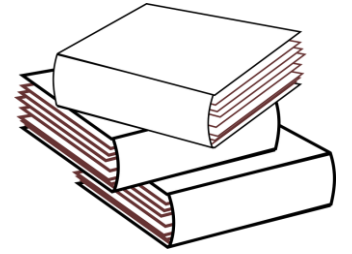


What is EPICS in IEEE?

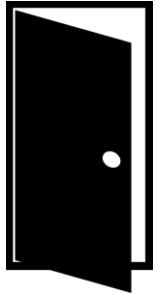
An IEEE Educational Activities Board (EAB) program and committee that **supports service-learning projects** that advance technology and benefit humanity through funding, resources and mentorship.

EPICS in IEEE was established in 2009 based on the EPICS at **Purdue University model.**

Education



Access and Ability



Environment



Human Services

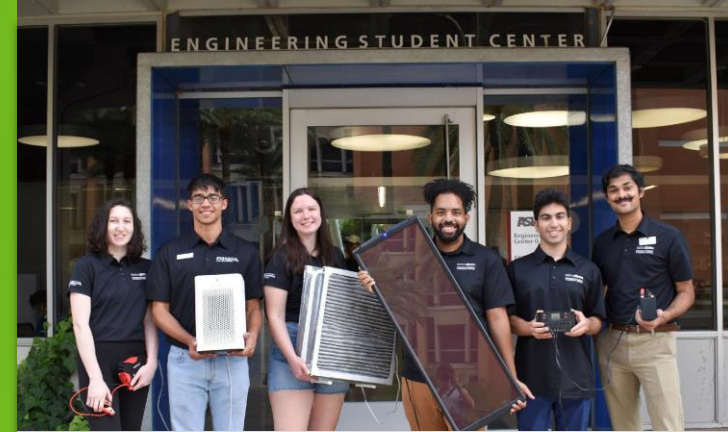




Engineering Student Learning Outcomes

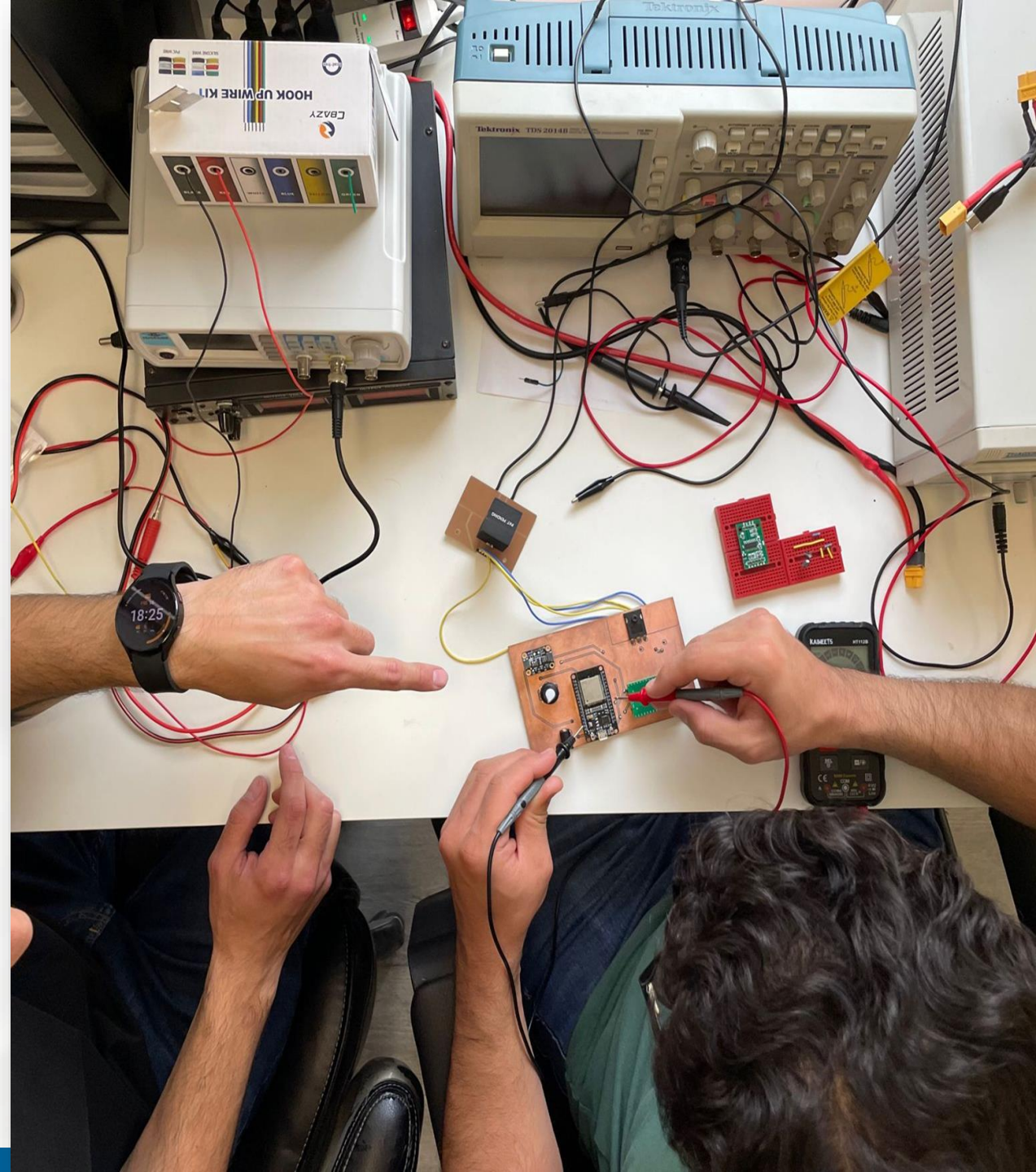
Students develop in-demand professional skills such as:

- Communication
- Collaboration
- Leadership
- Project Management
- Time Management



Engagement Opportunities for Young Professionals

- Create a team and submit a proposal
- Share our 'Call for Proposals'
- **Become an EPICS in IEEE team mentor**
- Volunteer to be a project reviewer
- Donate to support EPICS in IEEE projects
- Share our stories and impact
- Partner with EPICS in IEEE



Standard Project Team Format

- **Project lead**
 - Coordinates with EPICS in IEEE, can be a professional or student
- **Team members**
 - Main technical contributors (usually 3-5 in addition to project lead)
 - Can be students or professionals, preference is that at least one or more of these are students
- **Additional project support**
 - Some university teams may have an entire class assist with various stages of the project
 - If there are no students as team members, students should be significantly engaged in the project in some meaningful way as additional project support
- **Mentors**
 - This is you!
 - Teams may also have other industry mentors from before they were funded by EPICS in IEEE
 - Some projects based out of a university may have a faculty member overseeing the project
 - Some teams are connected to their local professional IEEE section with volunteers or mentors

If you serve as EPICS mentor, you should avoid:

- Purchasing supplies for the team from your own budget
 - The funding is provided by EPICS in IEEE and is tied to a specific budget that is approved by the committee
 - Most funds are distributed for use through an IEEE section, so students should work with them to obtain access
- Ensuring the project is a success by doing it yourself
 - Mentors are meant to guide the students, not do the project themselves
 - You should not be completing any major portions of the project yourself, nor serving as the project manager role
- Preventing students from making their own decisions or mistakes along the way
 - It is okay if not everything goes smoothly, as long as the community and non-profit aren't negatively impacted by the student learning


EPICS in IEEE Mentor Time Commitment

- Mentors are asked to check in with their team at least once a month to follow up on project progress
 - Can be in person if convenient, otherwise, most of these check-ins are expected to be virtual check-ins (web conferencing, phone calls, or emails).
- In general, we expect mentoring one team to take less than 2 hours a month.
 - You may have the opportunity to provide more time if you choose to become heavily involved in the project, but this is not an expectation.
- Most projects take one year, so your mentoring role will likely be less than this

While we do ask for regular feedback from teams, we appreciate our mentors informing us of any potential struggles or challenges a team may be facing in case we can offer any additional support that might change the outcome of a project. You can keep us updated at epicsinieee@ieee.org

IEEE Resources for Mentoring

Mentoring Resources

- Young Professional Resources
 - [IEEE Young Professionals](#)
 - [IEEE Volunteering Platform](#)
 - Cross-IEEE solution providing global access for Members to volunteer (Recruit, Manage & Track)
 - Simplifies the process of volunteering with IEEE
 - Facilitates the sharing of knowledge/expertise between veteran and novice practitioners
 - Recognizes volunteering efforts regardless of duration or intensity
 -  Encourages merit-based advancement within and beyond IEEE
- IEEE [entoring Meet: https://cmte.ieee.org/mentoring-meet/](https://cmte.ieee.org/mentoring-meet/)
- [EPICS in IEEE Mentoring Resources](#)
- [IEEE Mentoring Program through IEEE Collabratec®](#)

Questions?

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