MNT-EC
Micro Nano Technology Education Center

ADVANCED TECHNOLOGY TECHNICIAN TRAINING (AT3)

FUTURE STRATEGIC PLAN

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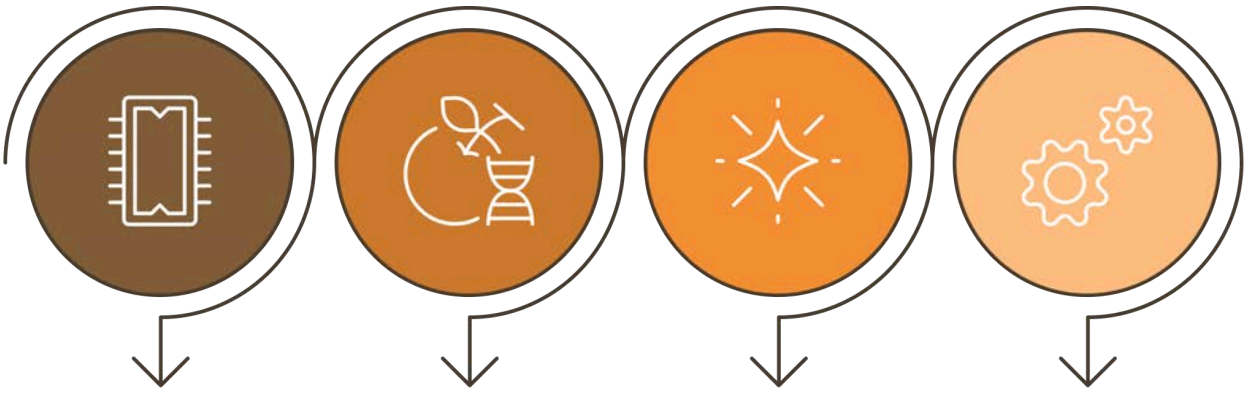
ABOUT:

The Advanced Technology Technician Training (AT3) Program* is a national initiative committed to preparing students for high-demand careers in the rapidly evolving fields of micro and nanotechnology (MNT).

As industries face critical shortages of skilled technicians, AT3 equips students with **hands-on training, cutting edge technical experience, and direct connections to industry partners**, serving as a **vital bridge from classroom learning to workforce readiness.** By doing so, AT3 not only helps fill immediate labor gaps but also strengthens the long-term pipeline of talent essential for U.S. innovation and competitiveness.

AT3 is closely aligned with national workforce priorities, including support for the domestic semiconductor manufacturing sector—a key focus of the CHIPS and Science Act, one of the most significant federal investments in advanced manufacturing and industrial policy in recent history. Through AT3, the next generation of highly skilled technicians is being trained to power America's future in advanced technologies.

Students are introduced to a range of MNT disciplines:



Microelectronics **Nanobiotechnology** **Photonics** **MEMS**

**AT3 is administered through the Micro Nano Technology Education Center (MNT-EC) at Pasadena City College and funded by NSF's Advanced Technological Education (ATE) Program.*

AT3's Success Is Threefold:

Hands-On Experience

- Students gain practical career-ready skills through virtual instruction and in-person training, including direct experience in university cleanrooms and laboratories, where they tackle collaborative, real-world projects.

Accessible and Affordable

- AT3 is built for cost effectiveness, delivering high-impact training, mentoring, and career pathways at a low program cost per student.

National Impact

- By cultivating a technician pipeline, AT3 strengthens U.S. manufacturing resilience and reinforces national leadership in advanced technology.

AT3 PROGRAM AT A GLANCE:

The AT3 Program serves as a dynamic national model, **designed to respond quickly to shifting workforce demands**. Instead of targeting a single industry, AT3 **evolves with market needs**—expanding semiconductor training during hiring surges or pivoting to support fields like biotechnology and beyond. This **flexible approach** ensures long-term relevance and prepares students for success across a range of high-growth technology sectors.

Key elements of the AT3 Program include:

- **Remote Industry Awareness Sessions** held each semester, connecting students directly with employers to explore career pathways and emerging technologies
- **Community College Training Pathways** offering modular, stackable credentials aligned with high-demand industry sectors
- **Peer Mentorship Programs** that build student confidence and support smooth transitions from education to employment.
- **TAP 3D Virtual Reality Simulations** that immerse students in cleanroom, laboratory, and advanced technical environments for hands-on learning

Career Pathways: AT3's Two Tracks

AT3 offers a dual-pathway model to meet students where they are and support their long-term success:

- **Workforce Entry (75%)** – The majority of students are equipped for direct entry into technician roles through AT3's targeted training, industry-recognized certifications, and hands-on experiences such as internships and lab-based learning.

- **Four-Year Transfer (25%)** – A focused subset of students receive structured support to transfer into four-year engineering programs, preparing them to meet the growing talent demands of the advanced manufacturing and technology sectors.

AT3 Builds Early Connections Between Students and Employers:

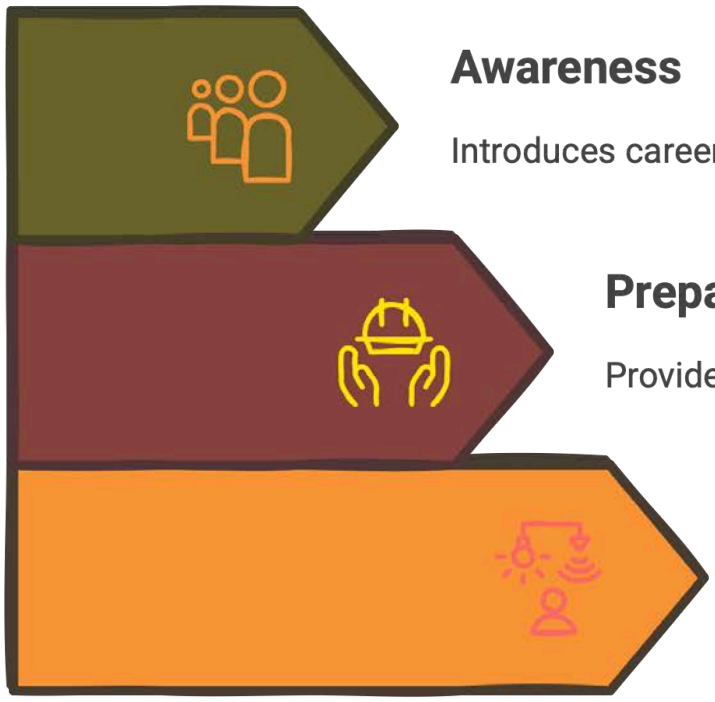
Early Exposure & Career Awareness

- Weekly sessions with professionals offering real-world insights and career guidance
- Early exploration of technician pathways and roles in advanced technology fields
- Hands-on engagement through partnerships with university labs and industry facilities

Career Preparation & Workforce Access

- Immersive, project-based learning that builds critical workplace and technical skills
- A structured 9-month onboarding experience featuring:
  - ➤ TAP 3D VR cleanroom training,
  - ➤ CTECS Workforce Readiness Assessment
  - ➤ Integration with community college certificate and degree programs
- Direct placement into paid internships with industry and university partners

AT3 Student Pillars:



Awareness

Introduces careers and employer connections

Preparedness

Provides training and skills development

Access

Offers internships and workplace experiences

AT3 CONNECTIONS:

Introducing High School Students to MNT Careers

AT3 Connections exposes **10th to 12th grade students** to technician careers in MNT fields. As an extension of the national AT3 Program, AT3 Connections plays a critical role by engaging students earlier—equipping them with industry-aligned skills and awareness before they enter college. This **early exposure** helps build a stronger, more sustainable technician pipeline, preparing the next generation of talent to meet future workforce demands.

Career Awareness & Industry Exploration:

- **Interactive Outreach Days:** Virtual and in-person events featuring industry panels and hands-on activities that highlight real-world applications of technology and expose students to a range of technician career paths.
- **Weekly Engagements:** Ongoing programming during the academic year keeps students actively connected and continuously deepens their understanding of industry sectors.
- **National Industry Partnerships:** Events are aligned with national workforce priorities through collaborations with partners such as the SEMI Foundation, SRC, PowerAmerica, SMART Institute, Natcast, and more.
- **Flexible Industry Focus:** The adaptable curriculum integrates sector-specific modules that respond to evolving national trends and workforce needs in high-demand industries.

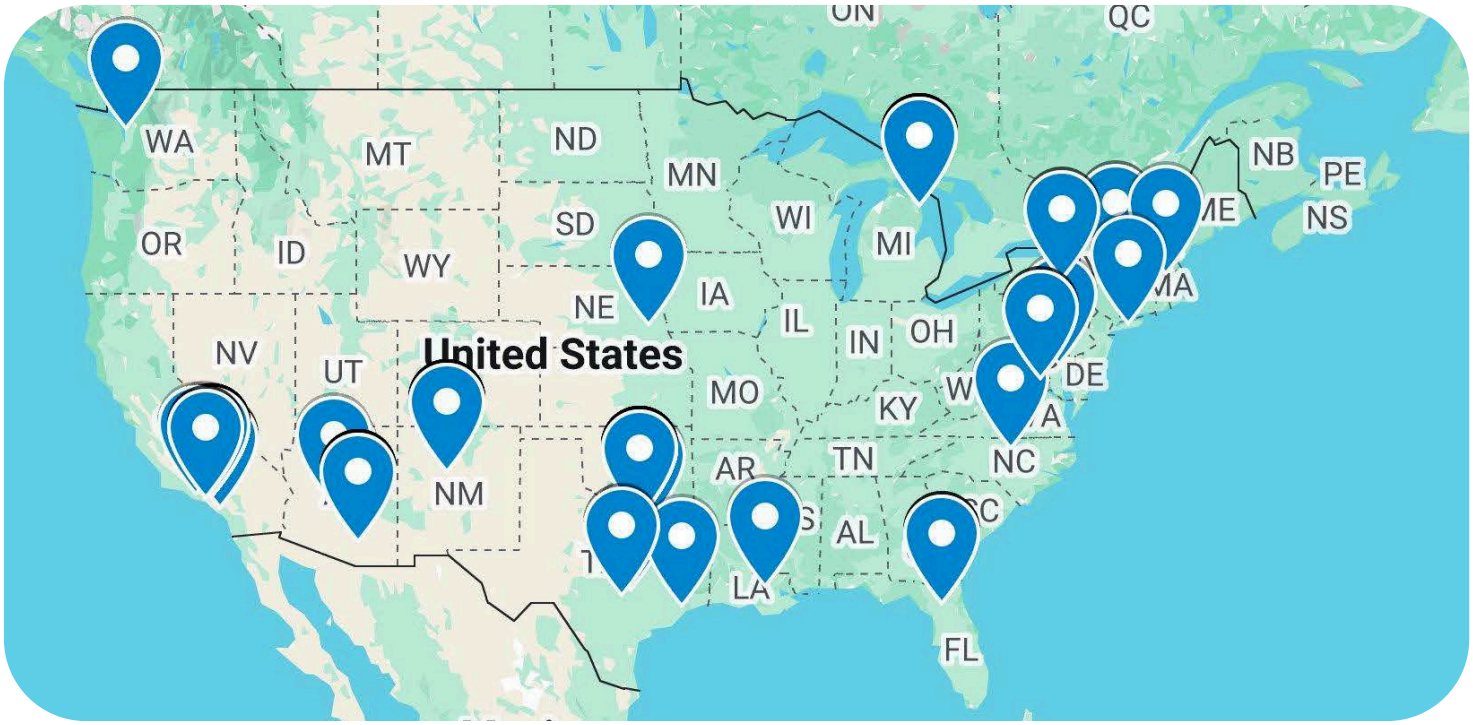
Academic & Technical Skill Building

- **Dual Enrollment Opportunities:** High school students can get a head start on their career or college journey by **earning college credit** through coordinated programs with local community colleges.
- **Industry-Aligned Tools and Training:** Students gain access to essential resources that build technical readiness:
  - *TAP 3D VR Simulations* – immersive training in cleanroom and lab environments
  - *CTECS Workforce Readiness* – assessments and digital badges to verify job-ready skills
  - *MNTFolio* – a digital platform to track credentials and achievements
- **Peer Mentorship:** Current community college students serve as **mentors**

AT3 IMPACT:

AT3 connects students to high-impact internships at top industry partners like Micron, Texas Instruments, and Intel, as well as premier research institutions.

In its first year alone, the program placed 128 students into 162 internships nationwide—demonstrating that with sustained investment, AT3 can rapidly scale to strengthen the national talent pipeline and equip students with real-world, career-ready experience.



Nationwide impact: In 2024 AT3 student interns were placed at research labs, cutting-edge industry sites, and top universities across the country—demonstrating the program's broad and growing impact.

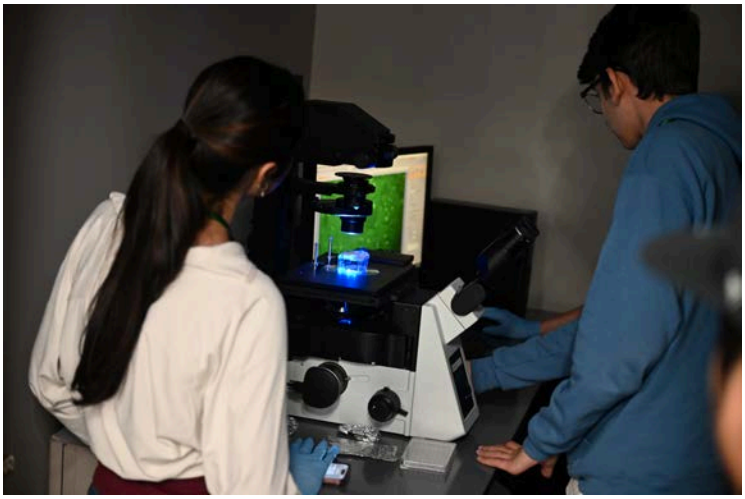
STUDENT TESTIMONIALS:

"Thank you so much for the opportunity! It has been a pleasure being a part of the AT3 Cohort 1 program. I look forward to continue working with the program in the future!"

"I would like to thank everyone who makes this program possible. From the head PI, administrators, software creators, mentors, and industry."

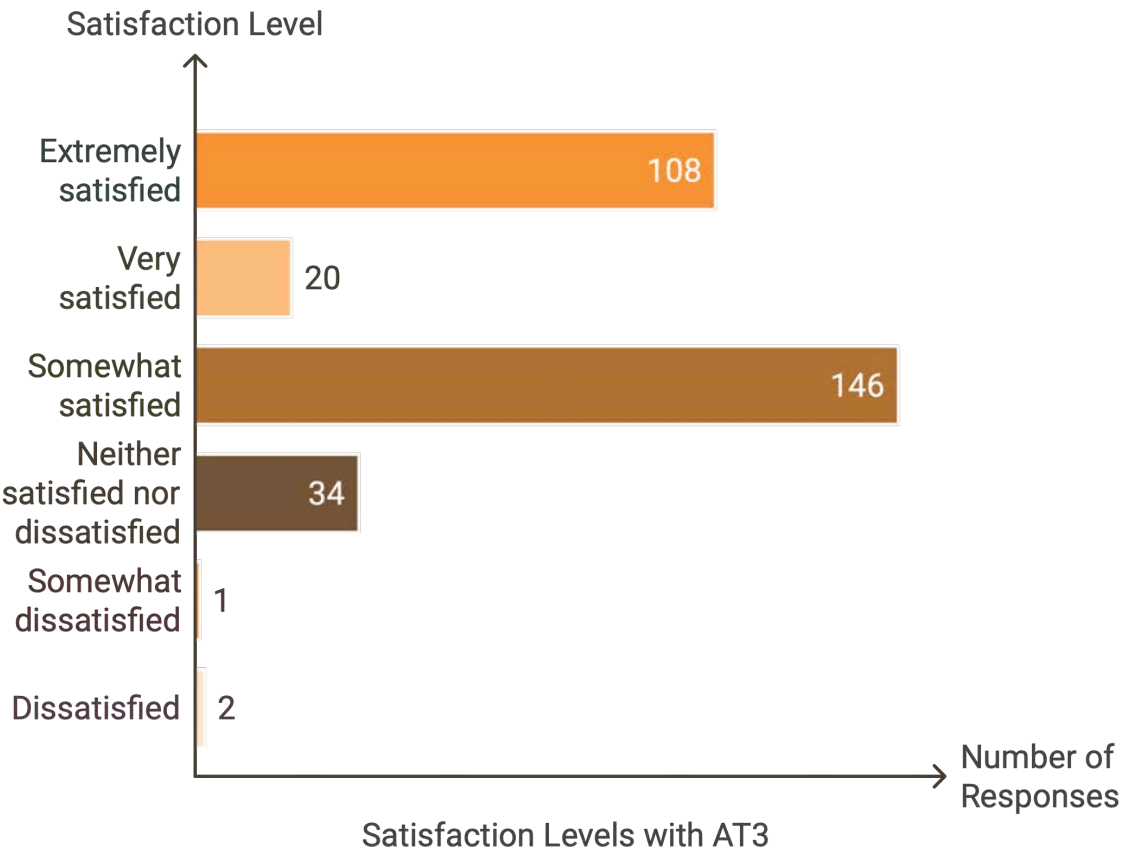
"Thank you so much for the time I spent with this cohort! I learned multiple things about the semiconductor industry and the other industries that are around the U.S."

"I appreciate the support and the kindness that the mentors and staff bring to the program. I am grateful and blessed to be a part of this experience."

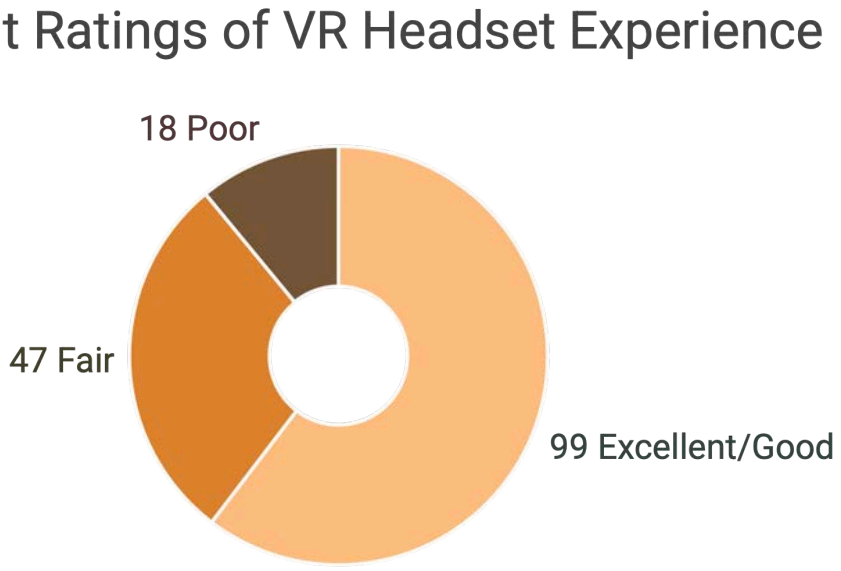


Mentorship that matters: AT3 students praise the program's mentorship and industry exposure as standout experiences in their professional growth.

Post AT3 Survey Responses:



Strong Student Satisfaction and Engagement: *AT3 participants consistently report high satisfaction, with many citing the program's immersive AR/VR tools as a standout feature that enhances their hands-on learning experience.*



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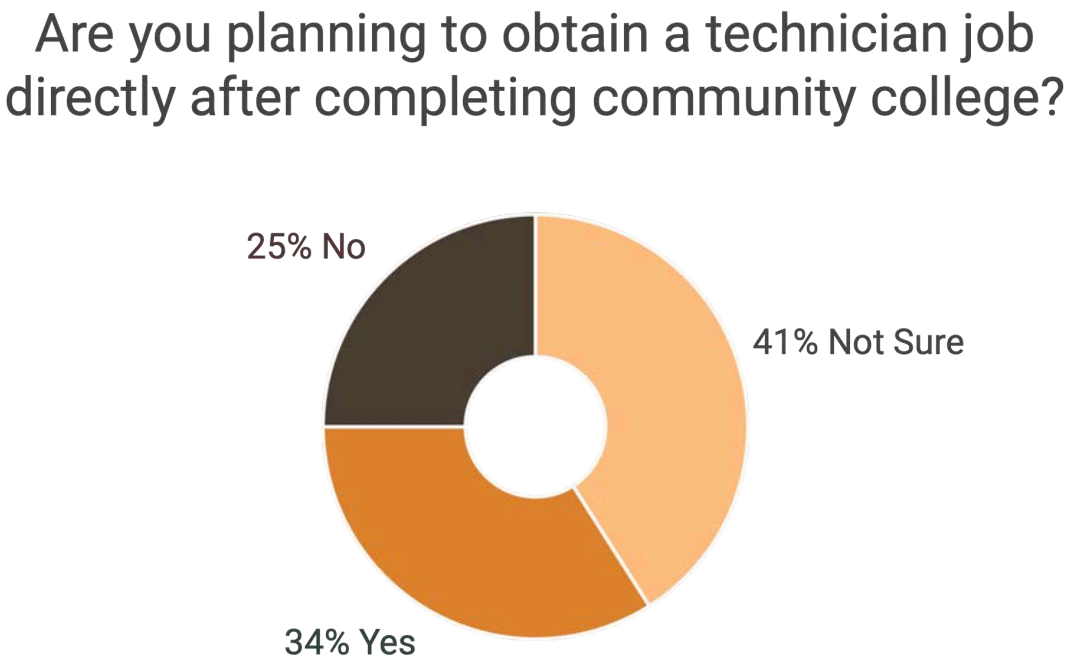
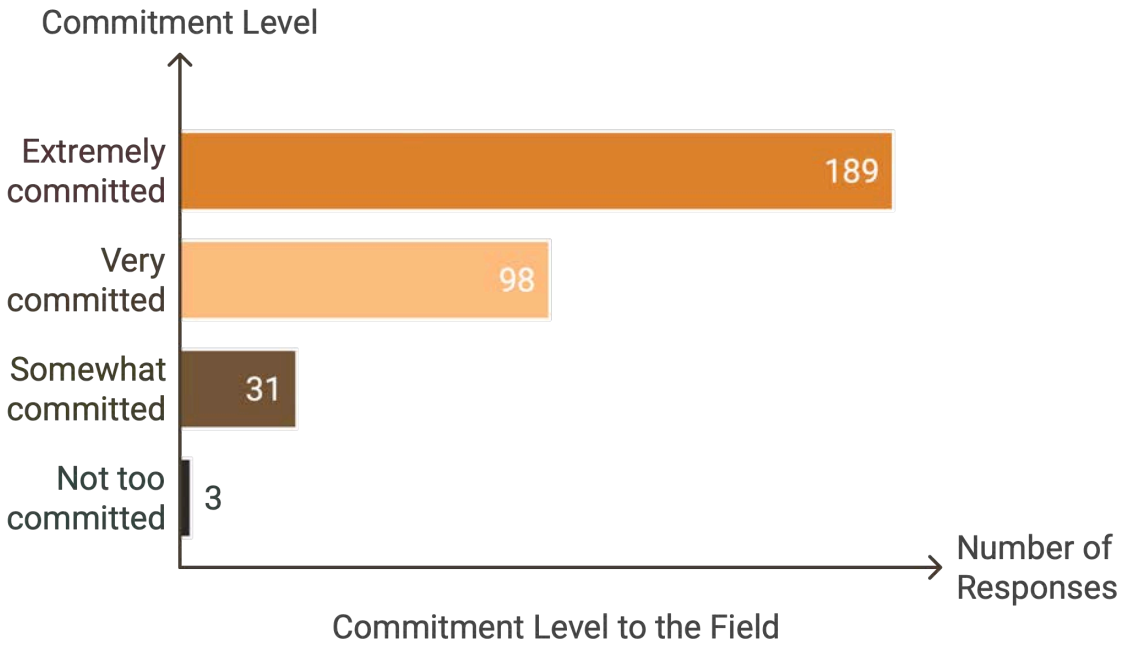


Increased Career Interest and Commitment: *Following their AT3 experience, participants surveyed showed strong enthusiasm for pursuing careers in the technician workforce and demonstrate a deepened commitment to the micro and nanotechnology (MNT) field.*



AT3: VISION FOR THE FUTURE

AT3 has the power to transform the technical workforce pipeline, but its long-term sustainability is at risk. Currently dependent on government funding, the program remains vulnerable to shifting political priorities, economic uncertainty, and administrative transitions. Yet the need for a highly skilled, adaptable workforce has never been more critica. Our nation's economic growth and technological leadership depend on it.

At just $3,285 per student, AT3 is a cost-effective, high-impact solution—supporting 300 students annually through a dual-mission model that raises career awareness while delivering targeted technician training in high-demand MNT sectors. A sustained three-year investment will ensure program stability and firmly establish AT3 as a vital engine for America's future technical workforce.

THE VISION

Partnering in a three-year investment in AT3 ensures lasting impact. With stable funding, the program can train and prepare 900 students for high-demand technical careers—at a remarkably low cost of just $3,285 per student—strengthening the skilled workforce pipeline nationwide. **This investment not only supports individual student success but also addresses critical microelectronic industry needs.**

KEY IMPACTS

Cost-Effective

AT3 supports students at just $3,285 each—significantly below the cost of comparable workforce programs, while delivering high-quality, industry-aligned training.

Dual Mission

AT3 builds early career awareness and provides hands-on training in high-demand sectors such as semiconductors and biotechnology.

Scalable Model

AT3 reaches up to 300 students annually at both the high school and post-secondary levels, with the infrastructure and flexibility to scale even further.

Flexible by Design

AT3 responds swiftly to evolving workforce needs and national priorities, ensuring long-term relevance and adaptability in a dynamic economy.

Proven Results

In its first year, AT3 placed 128 students in internships with industry leaders such as Intel and Micron, as well as top research universities —providing real-world experience and critical career exposure.

PROPOSED BUDGET:

Student Support and Engagement

Student stipends and student mentor compensation

Program Delivery and Faculty Support

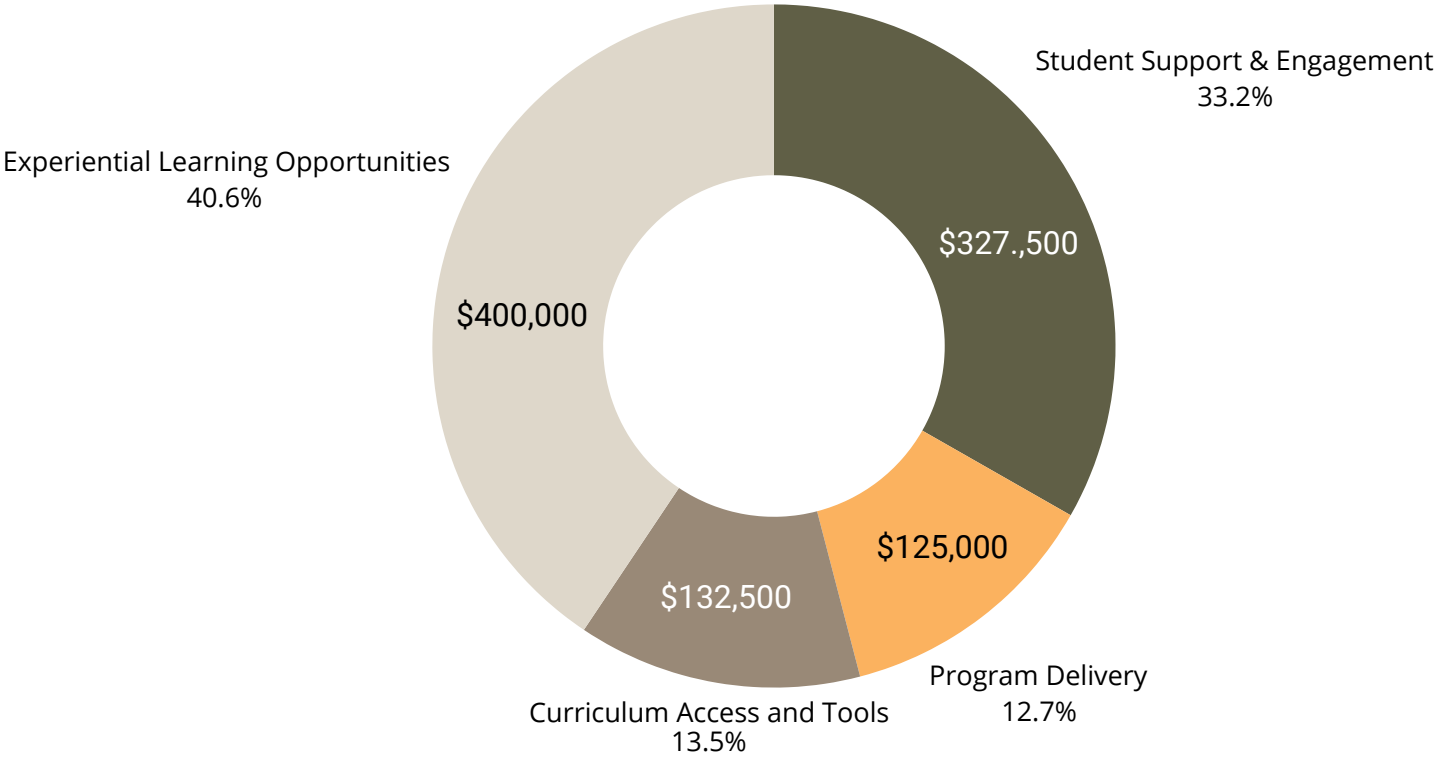
Administrative support and community college mentors

Curriculum Access and Tools

TAP 3D, CTECS assessment, MNTFolio

Experiential Learning Opportunities

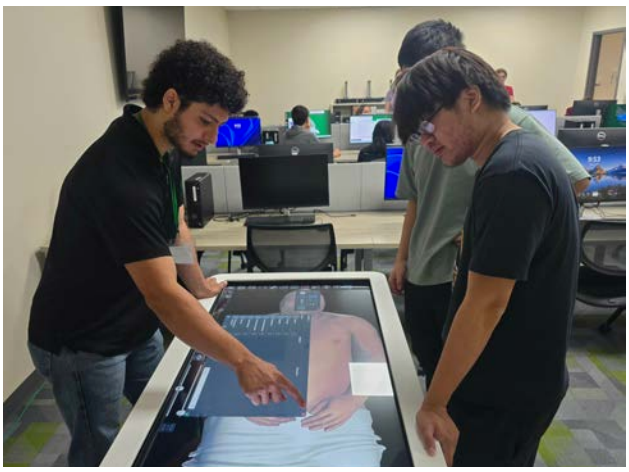
Travel support for conference attendance



Student Support & Engagement:

The proposed budget includes completion stipends for AT3 and AT3 Connections participants, as well as financial support for peer mentors who play a vital role in keeping students engaged and on track. These targeted investments are essential for driving meaningful outcomes and sustaining long-term participation.

Category	Quantity	Unit Cost	Total
Student Stipends *(Community College)*	150	$1,000	***$150,000***
Student Stipends *(High School 'AT3 Connections')*	150	$250	***$37,500***
Student Mentor Leads	4	$25,000	***$100,000***
Student Mentor Assistants	8	$5,000	***$40,000***



Hands-on learning in action: AT3 students build real-world skills through immersive research paired with effective mentorship

Curriculum Access & Tools:

This portion of the budget funds essential training tools that give students a competitive edge, including immersive VR simulations, workforce credentials, and dynamic digital portfolios to showcase their skills to employers

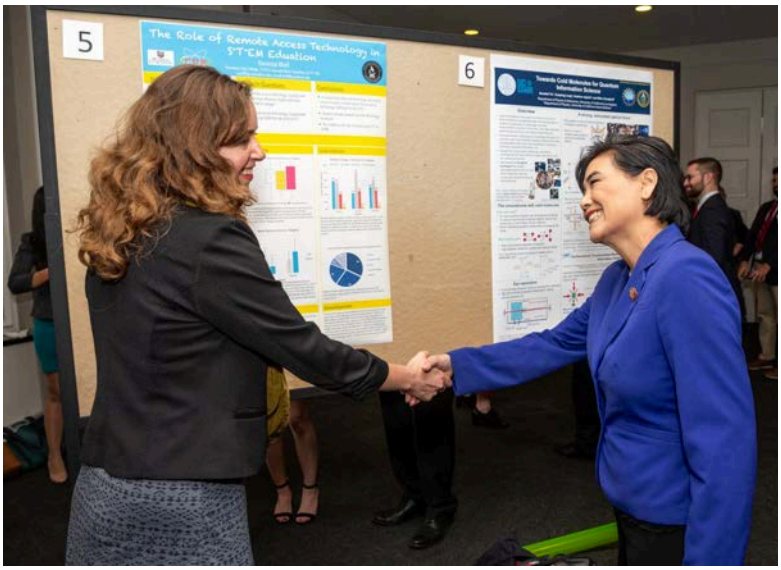
Category	Total
TAP 3D Semiconductor Training Modules: *Immersive VR modules simulating cleanroom protocols, maintenance procedures, and advanced instrumentation*	***$75,000***
CTECS Workforce Readiness Curriculum (300 @ $25): *A digital badge that validates critical employability skills valued by industry*	***$7,500***
CAST MNTFolio Digital Portfolio Platform: *Personalized digital portfolio will allow students to track competencies, upload project work, and present credentials to employers*	***$50,000***

Showcasing success: AT3 students earn industry-recognized badges and certificates while building digital portfolios that highlight their skills.

Experiential Learning Opportunities:

This funding enables student travel to premier industry conferences such as TechConnect and SEMICON West, where they present research, attend expert panels, and build valuable networking skills—experiences that deepen industry awareness and open doors to future career opportunities.

Category	Total
Travel Support for Tech Connect / SEMI Con West Conference	***$400,000***

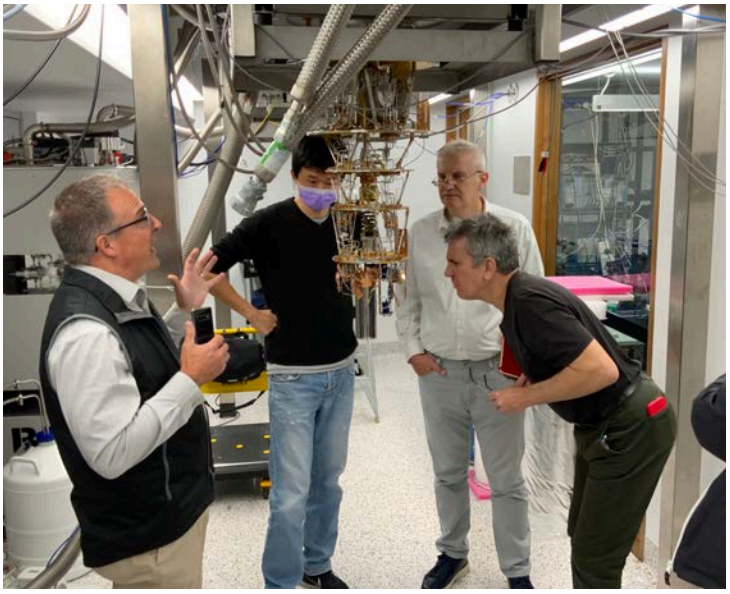


Expanding horizons: At TechConnect 2024, students presented research and joined policy roundtables, illustrating how conference travel support fosters meaningful engagement beyond the exhibit floor.

Program Delivery & Faculty Support:

Funding provides stipends for community college faculty mentors who offer students consistent guidance and essential academic support throughout the program. It also covers administrative overhead to ensure AT3 operates smoothly and efficiently

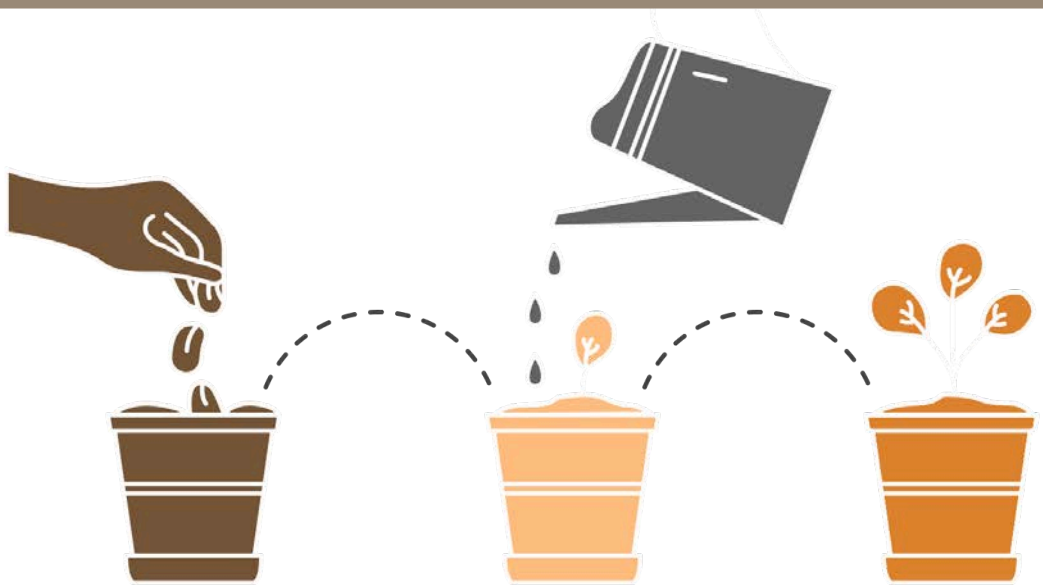
Category	Quantity	Unit Cost	Total
Administrative Support Staff	3	$25,000	***$75,000***
Community College Faculty Mentors	25	$2,000	***$50,000***



Faculty mentors in action: Community college instructors serve as trusted guides, helping students navigate technical training and build cronfidence.

The AT3 Program delivers strong student outcomes at just $3,285 per participant, making it a smart, scalable investment in the future MNT workforce. By providing real-world experiences, it builds the confidence students need to take their next step: whether entering a training program, securing an internship, or launching a technician career. Reaching students early at both the high school and community college levels, AT3 also fills a critical gap in the national workforce pipeline.

Sustained investment will allow AT3 to expand its reach and impact even more students across the country.



Career-Seeking Learners

Students lack first-hand experience

AT3 Program

Nationwide internship placement of students and training support

Skilled Workforce

Students gain expertise and join the MNT workforce

ACKNOWLEDGEMENTS

AT3 would not be possible without the invaluable support of industry and partner networks.

We extend our deepest gratitude to the ME Commons Midwestern Microelectronics Consortium (MMEC) for their generous funding, which ensured that every student who applied to AT3 for the 2024-2025 program was accepted. Their commitment helps advance AT3's mission: to ensure that no community college student is ever turned away from participation.

We also want to thank Texas Instruments (TI) for their insights and collaboration, which played a pivotal role in shaping the AT3 program. Their guidance was instrumental in bringing this initiative to life. Another thank you is extended to the SEMI Foundation and NIICA for their thought leadership and support throughout the development of these programs.

Finally, successful education and workforce programs thrive when all partners prioritize student success over individual gain. This shared commitment defines MNT-EC's partner network. We appreciate everyone who has contributed to building this program, centered on the goal of strengthening the U.S. microelectronics industry through a well-prepared and skilled workforce.

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