Introductions

Larry McWherter
NITIC PI/Director
Assistant Dean
Columbus State

Kyle Jones
NITIC Co-PI
Assistant Dean
Sinclair College

Stephanie Schuler
NITIC Assistant Director
Columbus State

NITIC
National Information Technology
Innovation Center

National IT Innovation Center

- The National Science Foundation's (NSF) Advanced Technological Education (ATE) program supports centers across the U.S. to define and disseminate the critical knowledge and skills required for technician education in advanced technology industries.

- NITIC is led by **Columbus State Community College** and our core partners:
    - Collin College
    - Lone Star College
    - Maricopa Community College District
    - Sinclair Community College

NITIC will create valuable products and deliverables that will advance knowledge in IT education, including the following:

IT Innovation Network

Join the IT Innovation Network (ITIN) and be part of our Community of Practice for faculty sharing, learning, and problem-solving.

Innovation Clearinghouse

Access or share new IT curriculum assets and resources in the Innovation Clearinghouse.

Professional Development

Take advantage of Professional Development opportunities, including Working Connections Virtual and In-Person Workshops.

Business Industry Leadership Teams

Stay up to date on industry needs and employer engagement through Business Industry Leadership Teams (BILT).

NITIC
National Information Technology
Innovation Center

Website http://www.nitic.org

Why This Matters

- The pace of change is accelerating
- Faculty must prepare students for both today's and tomorrow's careers
- Students need tech fluency and cross-disciplinary, business-savy thinking

NITIC – Trends "Highlight Reel"

Insights we've gathered through our webinars, industry meetings, and faculty engagement

|			
Gen AI's Impact on the Cyber Workforce	AI-Powered Teaching	Work-Based Learning Through Miro-Internships	Faculty Externships
Integration of Operational Technology	Container Technology	Quantum and Advanced Infrastructure	Modern Data Management
	Skills Beyond the Technical		

NITIC
National Information Technology
Innovation Center

IT Trends

Gen AI's Impact on the Cyber Workforce
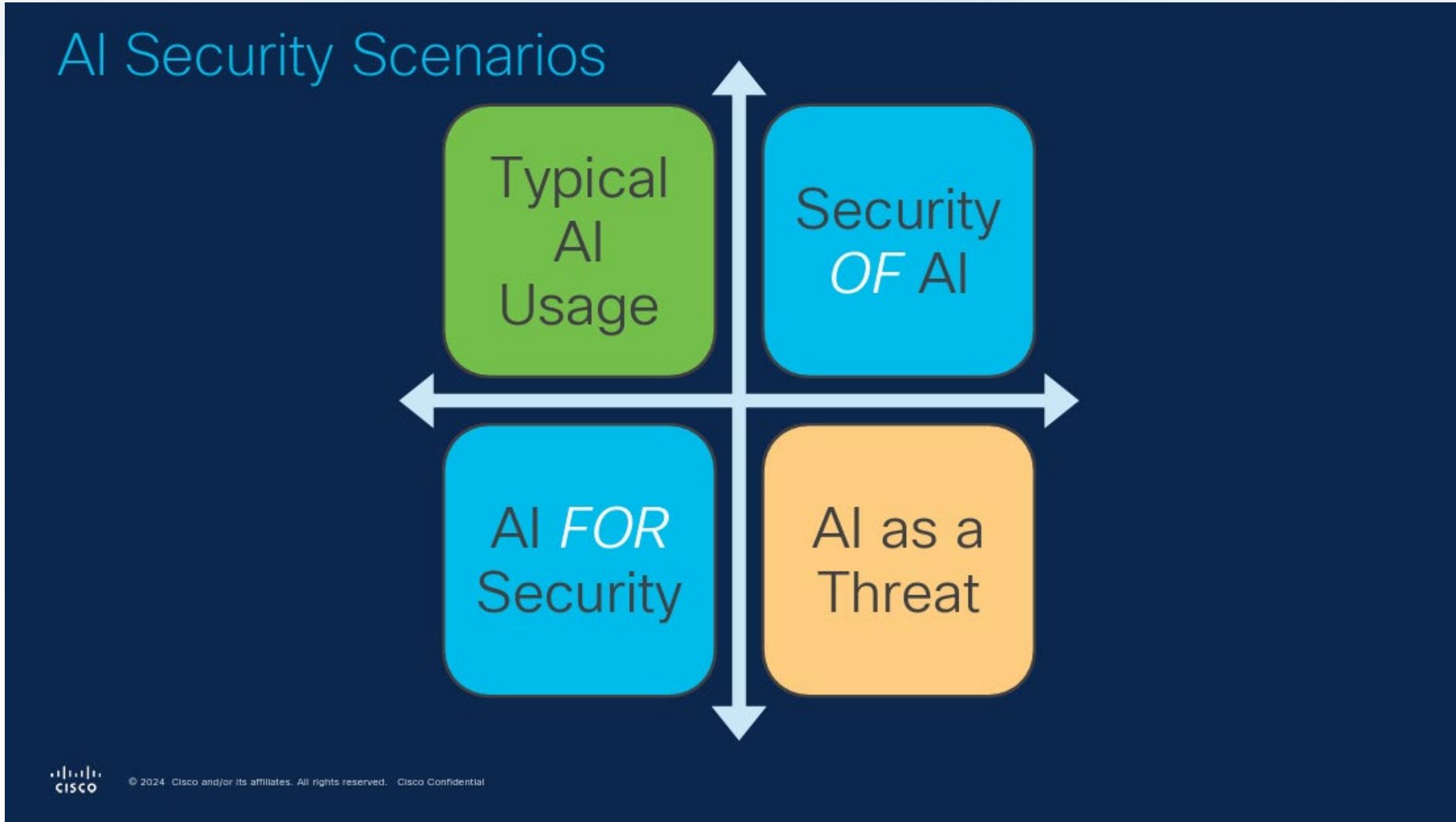
Credit: Helen Patton, CISCO

Gen AI's Impact on the Cyber Workforce

Trend
- GenAI is reshaping how organizations secure, defend, and attack.
- Cybersecurity roles vary by region, sector, and employer.
- Agentic AI introduces new ethical and operational risks.

Key Concepts
- **Security of AI** – AI systems as potential vulnerabilities.
- **AI for Security** – AI in threat detection and response.
- **AI as a Threat** – Adversarial uses: deepfakes, phishing, automation.

Implications for Educators
- Prepare students for mid-level roles: entry-level is shrinking.
- Emphasize AI literacy, critical thinking, and threat modeling.
- Incorporate ethical AI frameworks and responsible use into curriculum.

NITIC
National Information Technology
Innovation Center

AI-Powered Teaching

Trend
- AI tools like ChatGPT are transforming how faculty prepare and deliver instruction.
- Instructional AI mirrors workplace tools, encouraging early familiarity.

Key Concepts
- AI can enhance feedback, engagement, and time efficiency.
- Students need to learn how to prompt, assess, and ethically use AI.

Implications for Educators
- Model effective AI use in your own classroom.
- Scaffold student experiences with prompt engineering and validation skills.
- Leverage NITIC's resources (e.g., AI webinar series, Working Connections).

NITIC
National Information Technology
Innovation Center

AI-Powered Teching

AI Use Policy for This Course - Acceptable Uses

This course embraces the responsible use of AI tools to enhance your learning experience. We will discuss AI openly and collaboratively refine our approach throughout the semester. Here are guidelines for acceptable and unacceptable AI use:

- **Acceptable Uses:**
  1. **Study aid:** Use AI to generate practice questions or create study guides based on course materials.
     - Example: Ask ChatGPT to "Create 10 multiple-choice questions about photosynthesis."
  2. **Brainstorming:** Utilize AI for initial idea generation or to overcome writer's block.
     - Example: Prompt an AI tool with "List 5 potential thesis statements for an essay on climate change impacts."
  3. **Clarification:** Ask AI to explain complex concepts in simpler terms.
     - Example: Request "Explain the concept of supply and demand as you would to a 10-year-old."
  4. **Outline creation**: Use AI to generate initial outlines for papers or projects.
     - Example: Input your topic and ask "Create a basic outline for a research paper on renewable energy sources."

AI Powered Teaching: Ignite Innovation and Engagement

Credit: Nancy Miller, Forsyth Technical Community College

AI-Powered Teaching

AI Use Policy for This Course - Unacceptable Uses

1. **Cheating**: Using AI to answer test questions or complete graded assignments.
   - Example: Inputting exam questions into ChatGPT to get answers.

2. **Plagiarism**: Submitting AI-generated text as your own work without proper attribution.
   - Example: Using an AI tool to write an entire essay and presenting it as your own.

3. **Replacing critical thinking**: Relying on AI for analysis or conclusions without applying your own reasoning.
   - Example: Asking AI to "Analyze the themes in To Kill a Mockingbird" without reading the book or forming your own interpretations.

Remember, the goal is to use AI as a tool to support your learning, not replace it. Always apply your own critical thinking and cite AI use when appropriate. If you're unsure about a specific AI use, please ask for clarification.

AI Powered Teaching: Ignite Innovation and Engagement

Credit: Nancy Miller, Forsyth Technical Community College

Work-Based Learning Through Micro-Internships

Trend
- Employers seek early exposure and soft skills, not just technical mastery.
- Micro-internships offer short-term, real-world experience that builds confidence and clarity.
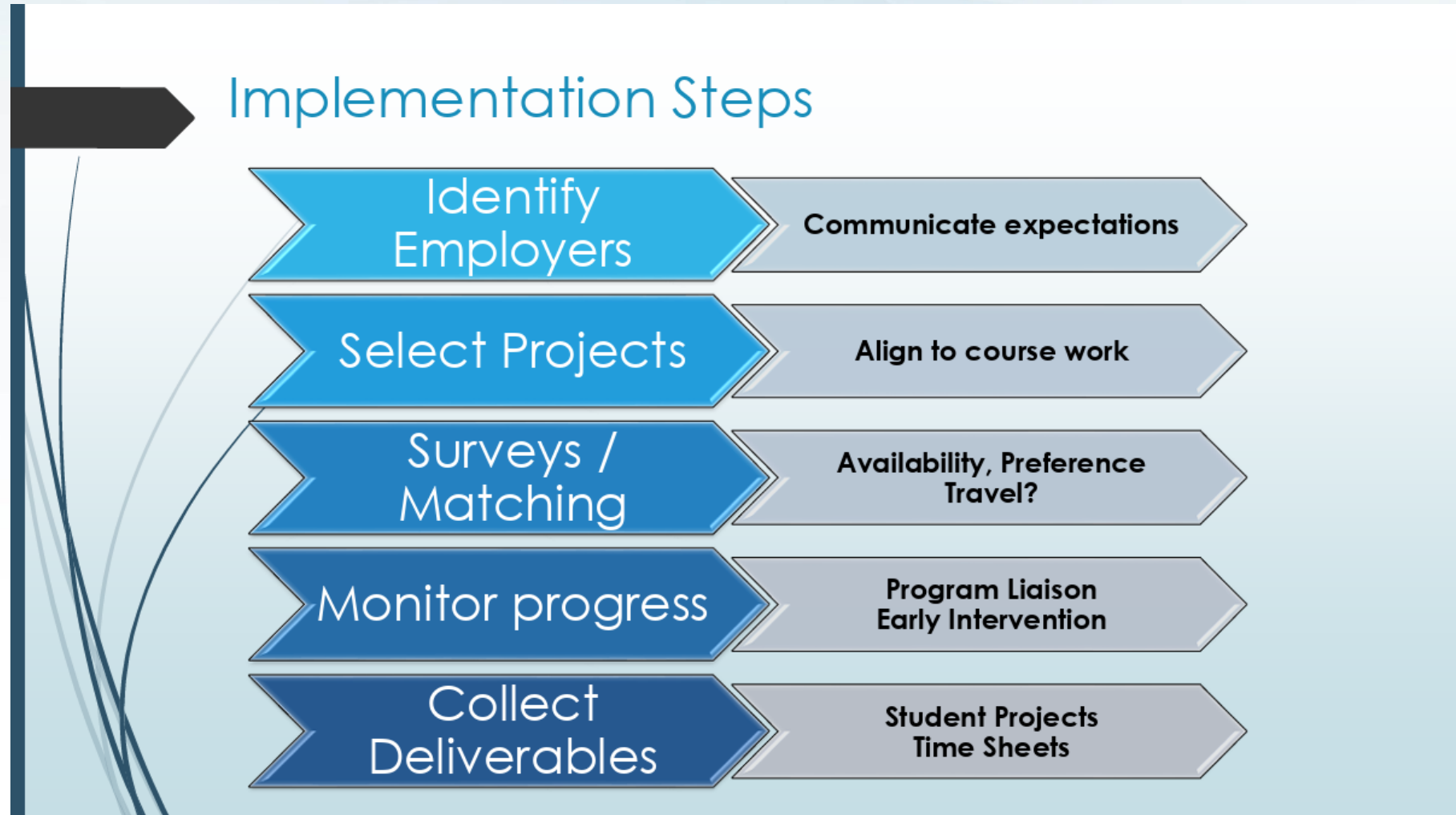
Key Concepts
- Students benefit from "trying" roles before they commit to a path.
- Low-stakes, project-based internships promote engagement and skill discovery
- Helps bridge the gap between classroom learning and workforce expectations

Implications for Educators
- Develop employer partnerships to support embedded experiences.
- Integrate reflection and articulation into internships (e.g., how to "tell your story").
- Use student insights and employer feedback to refine curriculum and skill-building

NITIC
National Information Technology
Innovation Center

Work-Based Learning Through Micro-Internships

Implementation Steps

Identify Employers	Communicate expectations
Select Projects	Align to course work
Surveys / Matching	Availability, Preference Travel?
Monitor progress	Program Liaison Early Intervention
Collect Deliverables	Student Projects Time Sheets

Credit: Eugene (Chris) Kinnaird, Miami Dade College

Faculty Externships and Industry Alignment

Trend
- Faculty externships are powerful tools to bring real-world practices and technologies back into the classroom.

Key Concepts
- 80+ hour placements in diverse industries (e.g., IoT, local gov, defense contractors)
- Participants report improved curriculum, better labs, and stronger student readiness

Implications for Educators
- Pursue externships as professional development
- Use experiences to update teaching materials and integrate real-world scenarios
- Help students understand cross-disciplinary skills required in modern tech roles

NITIC
National Information Technology
Innovation Center

# Integration of Operational Technology

Trend
- OT systems power physical infrastructure—blending IT with the "real" world.

Key Concepts
- OT includes SCADA, PLCs, and HMI systems in fields like energy and logistics.
- OT/IT convergence introduces new security and automation complexities.

Implications for Educators
- Introduce OT components in cyber and systems courses.
- Use simulations and case studies to show impact and application.
- Encourage interdisciplinary skills—software + hardware + systems thinking.
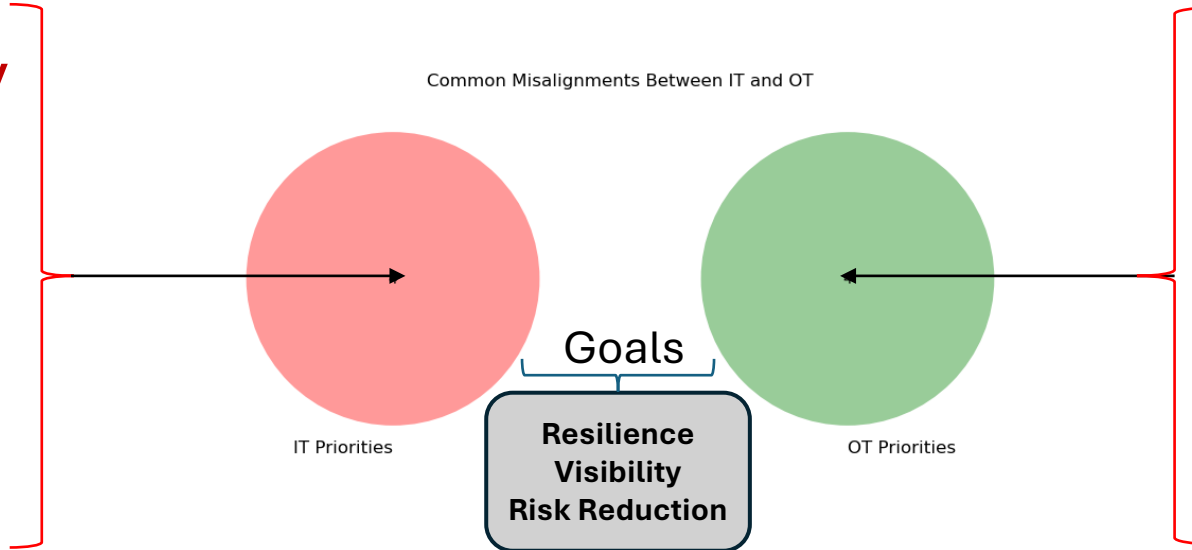

NITIC
National Information Technology
Innovation Center
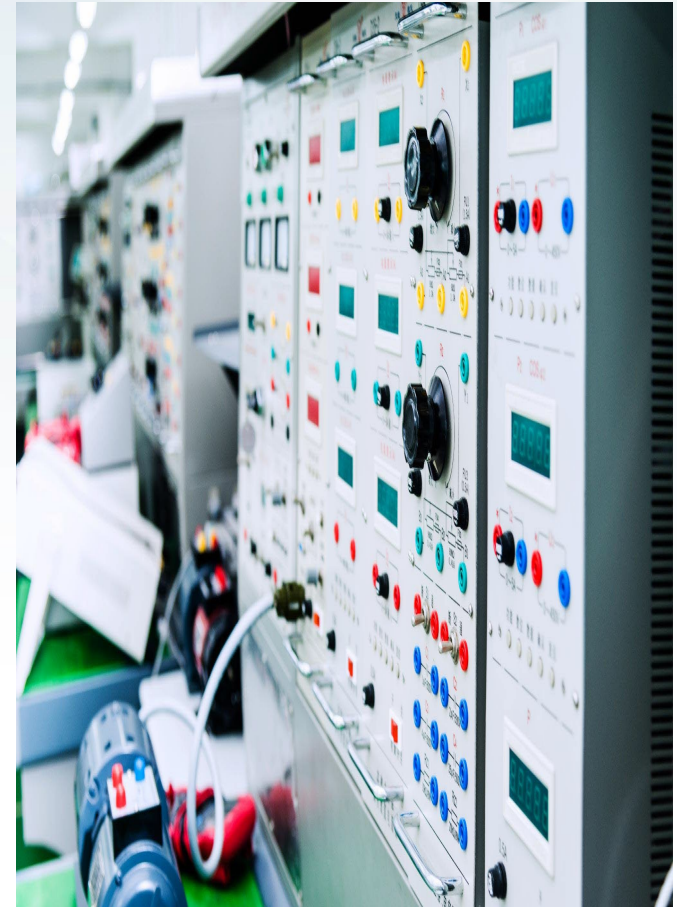
Common Misalignments Between IT and OT

IT Priorities

- Confidentiality
- Integrity
- Compliance
- Data Protection

OT Priorities

- Uptime
- Safety
- Real-Time Performance
- Legacy Systems

Common Misalignments Between IT and OT

IT Priorities

OT Priorities

Goals

Resilience Visibility Risk Reduction

Container Technology

Trend
- Containerization and cloud-native environments are now standard in IT infrastructure and cyber operations.

Key Concepts
- Use cases: pen testing, malware sandboxing, cyber ranges.
- Tools: Docker, Kubernetes, microservices environments.

Implications for Educators
- Teach containers as part of networking, cloud, or cyber courses.
- Use them to simulate real-world environments and infrastructure.
- Help students connect DevOps with security practices.

Quantum and Advanced Infrastructure

Trend
- Quantum and ISAC (Integrated Sensing and Communication) are emerging, high-impact technologies.
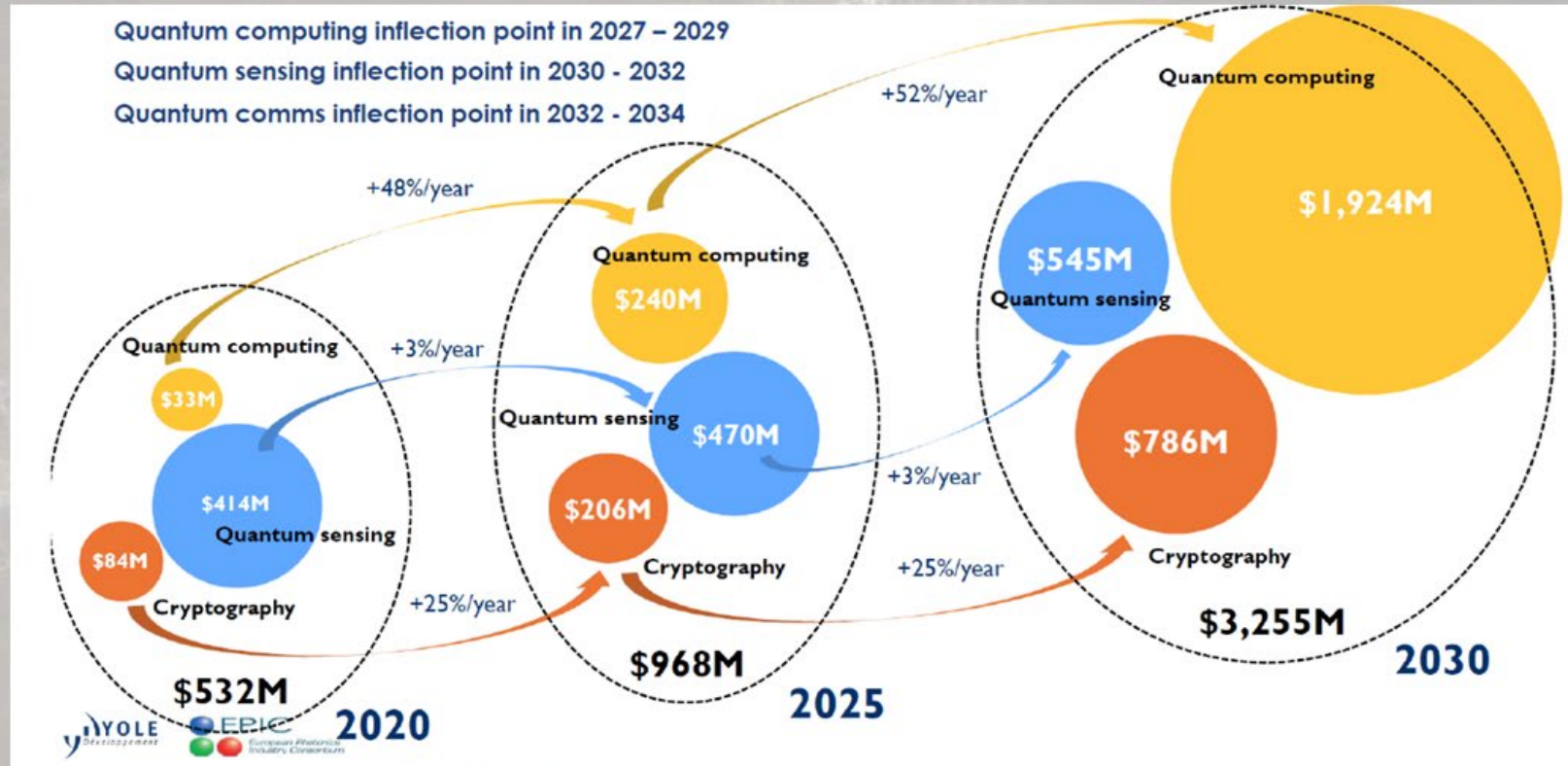
Key Concepts
- Quantum computing will change encryption and problem-solving.
- ISAC connects sensing with real-time decision-making in areas like defense and automation.

Implications for Educators
- Provide awareness-level exposure to emerging infrastructure.
- Encourage students to stay informed and develop adaptive learning habits.
- Use webinars or guest speakers to bridge expertise gaps.

NITIC
National Information Technology
Innovation Center

Quantum and Advanced Infrastructure

2020 – 2030 Market Forecast for Quantum Technologies

Quantum computing inflection point in 2027 – 2029
Quantum sensing inflection point in 2030 - 2032
Quantum comms inflection point in 2032 - 2034

Credit: Mo Hasanovic, Ph. D.

Modern Data Management

MongoDB

Trend
- Document databases like MongoDB are rapidly replacing traditional relational databases in many modern applications.

Key Concepts
- Flexible, document-based model (NoSQL) enables faster development and scalability
- Widely used in full-stack development, cloud apps, IoT, AI/ML projects
- MongoDB is the #1 document database and 5th overall by DB-Engines (Jan 2025)

Implications for Educators
- Integrate MongoDB into database or web development courses
- Use free resources from the MongoDB for Academia Program
- Apply hands-on projects to teach modern data handling

NITIC
National Information Technology
Innovation Center

Skills Beyond Technical

Trend
- Employers are prioritizing soft skills just as much—if not more—than technical certifications.

Key Concepts
- Top soft skills: integrity, communication, teamwork, professionalism, dependability.
- Students must understand business context and communicate their value.

Implications for Educators
- Incorporate teamwork, real-world problem-solving, and communication into tech coursework.
- Use mock interviews, project documentation, and reflective assignments.
- Help students translate their work into narratives for resumes and interviews.

NITIC
National Information Technology
Innovation Center

Closing

Trend Reflection

Which of these trends is most urgent for your program?

|			
Gen AI's Impact on the Cyber Workforce	AI-Powered Teaching	Work-Based Learning Through Miro-Internships	Faculty Externships
Container Technology	Integration of Operational Technology	Quantum and Advanced Infrastructure	Modern Data Management
	Skills Beyond the Technical		

IT Innovation Network

ITIN is a network of colleges collaborating and sharing knowledge to enhance IT program. It's FREE!

Membership:
- Membership overview and benefits
- Current member organizations
- Membership application
- ITIN member logins

Website Link: Join the ITIN - NITIC
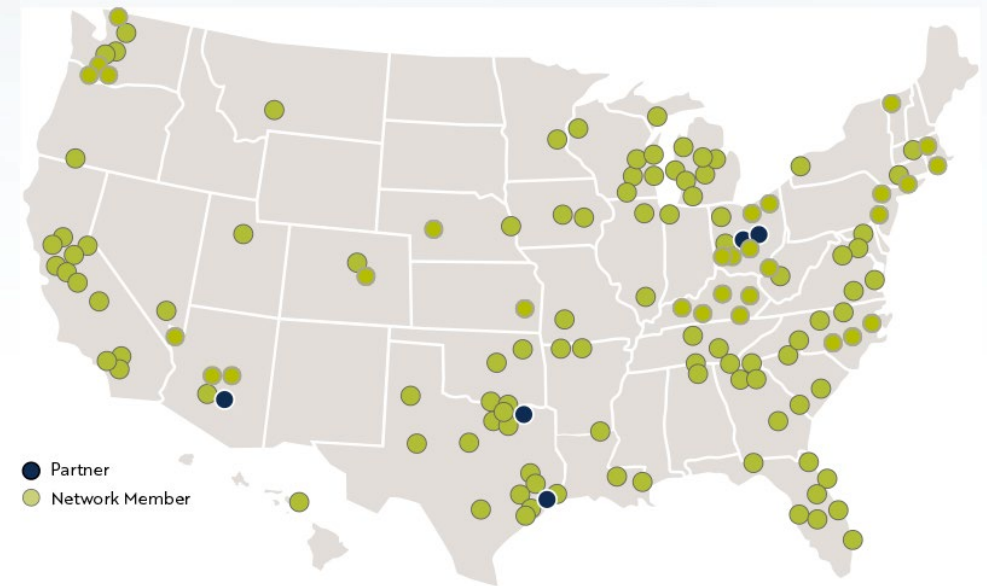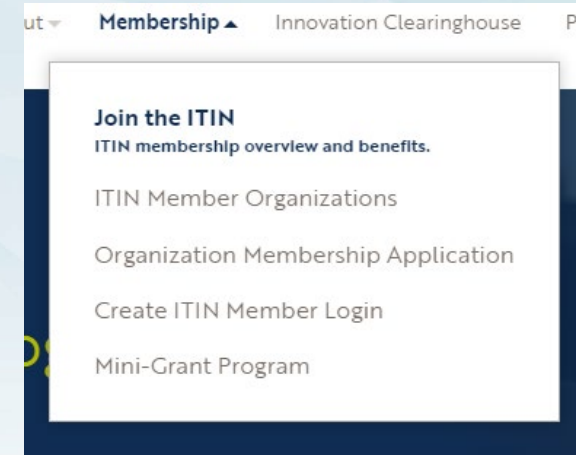
Community of Practice

The CoP events and forums are for ITIN members and can only be accessed behind a login.

- Register for Upcoming Events
- View Event Archive

Website Link: Community of Practice - NITIC

Upcoming CoP Events

Attendees must be ITIN members to register for and attend Community of Practice events.

Discover NITIC! How we'll work together to prepare the IT professionals of tomorrow

September 20th, 2024, 1:00 pm ET

DETAILS >

CoP Events Archive

> **National BILT Meeting – Software Development**
June 3rd, 2025, 11:30 am ET

> **Mini-Grants Office Hours**
May 15th, 2025, 2:00 pm ET

> **Mini-Grants Office Hours**
May 9th, 2025, 10:00 am ET

> **Year-End Recap**
May 2nd, 2025, 1:00 pm ET

> **MegaBILT Trends Meeting**
April 29th, 2025, 10:30 am ET

> **Enhancing Modern Database Education: MongoDB for Academia Info Session**
April 4th, 2025, 1:00 pm ET

> **Facing Quantum 2.0**
March 7th, 2025, 1:00 pm ET

> **National BILT Meeting – AI**
March 4th, 2025, 11:30 am ET

> **AI-Powered Teaching: Ignite Innovation and Engagement in Your Classroom & Your Office PART 2: Student Engagement**
February 26th, 2025, 1:00 pm ET

> **AI-Powered Teaching: Ignite Innovation and Engagement in Your Classroom & Your Office PART 1: Classroom Tools**
February 19th, 2025, 1:00 pm ET

> **Bridging Technology: An Introduction to Operational Technology**
February 7th, 2025, 1:00 pm ET

> **BILT Educator Cohort: Information Session**
February 5th, 2025, 2:00 pm ET

> **Artificial Intelligence and the Cybersecurity Workforce**
January 24th, 2025, 1:00 pm ET

> **National BILT Meeting – Mega-BILT**
January 21st, 2025, 10:30 am ET

> **Externships & Micro-Internships: Innovative Faculty and Student Engagements with Employers**
December 6th, 2024, 1:00 pm ET

NITIC
National Information Technology
Innovation Center

CoP Events Archive

Externships & Micro-Internships: Innovative Faculty and Student Engagements with Employers

December 6th, 2024, 1:00 pm ET

Learn more about how two programs connect with employers. The NCyTE center helps existing faculty enhance their technical skills through externships. Faculty must be well-versed in the workplace, work roles, and projects their students will engage in upon entering the workforce – and be able to integrate that knowledge into their teaching. Miami Dade College's micro-internship program placed students with employers during an introductory networking course. While traditional internship programs are geared toward students who have completed all or most of their studies, this unique program gave students an opportunity to gain hands-on experience at an early point in their academic pursuits.
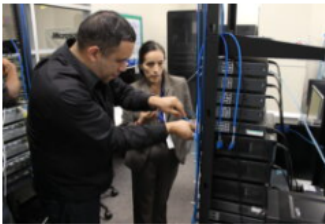
Presenter(s): Kyle Jones, Professor, NCyTE, Sinclair, Dayton, Ohio; Eugene Kinnaird, Faculty, Miami Dade College, Miami, Florida

Archive

NITIC Slide Deck >

Student Micro-Internships Slide Deck >

Faculty Externships Slide Deck >

Faculty Externships Top 5 Answers to Report Questions >

Externships & Micro-Internships Video >

Artificial Intelligence and the Cybersecurity Workforce

January 24th, 2025, 1:00 pm ET

GenAI is here, and the cybersecurity workforce is already impacted. We will discuss the current state of the cyber workforce, the challenges facing job seekers and companies in growing their security workforce and spend time exploring the impact of GenAI on the industry. Attendees will learn how to think about cybersecurity training in this new reality, and what will help students and teachers differentiate themselves in the new market.

About Helen: Helen Patton is a strategic cybersecurity advisor at Cisco. Her prior roles include CISO at The Ohio State University and in multiple security roles at JPMorganChase. Helen encourages cybersecurity collaboration across industries, to enable better information security practices. She works to expand the cyber workforce, and mentors people interested in pursuing cyber careers. She advocates for more naps and is anti-bagpipes. Helen has a master's degree in public policy and serves on industry advisory boards. Helen authored "Navigating the Cybersecurity Career Path".

Archive

NITIC Slide Deck >

AI & the Cybersecurity Workforce Slide Deck >

AI & the Cybersecurity Workforce Video >

NITIC National Information Technology Innovation Center

📅 Upcoming Offerings

ITIN Community of Practice Events

- Mega-BILT Trends Meeting: 8/19 @10:30 AM ET
- Welcome Back – Fall Webinar: 9/12 @1 PM ET
- Tech Talk: Emerging IT: 9/17 @1 PM ET
- Equipped for the Job Market: 10/3 @1 PM ET
- AI-Powered Teaching Part 1: 10/8 @1 PM ET
- AI-Powered Teaching Part 2: 10/15 @1PM ET
- Tech Talk for Cyber, Networking & Infrastructure: 11/19 @1 PM ET

Register: www.nitic.org/professional-development/community-of-practice

NITIC
National Information Technology
Innovation Center

📅 Upcoming Offerings

Fall Working Connections

Dates: Fridays | September 12 – October 24
Time: 3 PM – 7:30 PM ET Online
Track Topics:
- Generative AI & Prompt Engineering
- Programmable Logic Controllers
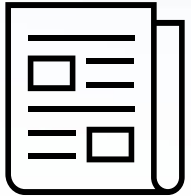- Azure AI Fundamentals
- CompTIA Server+

Register: www.nitic.org/professional-development/working-connections

Stay Connected with Us!

 Follow us on LinkedIn
https://www.linkedin.com/company/nsf-national-it-innovation-center-nitic

 Explore our newsletter: Bytes of Innovation
https://www.nitic.org/wp-content/uploads/2025/04/NITIC-Newsletter-April-2025.pdf

 Check us out on YouTube
https://www.youtube.com/@NationalITInnovationCenter

Bytes of Innovation
NEWSLETTER
January 2025

Calendar

Q&A

Thank you!

nitic.org | nitic@cscc.edu