

NICE Webinar Series

NATIONAL INITIATIVE FOR **CYBERSECURITY** EDUCATION



A Path to Obtaining Cybersecurity Work Experience:
Internships, Cooperative Education, and Apprenticeships

November 15 , 2017

National Cybersecurity Career Awareness Week

November 13-18, 2017

The National Cybersecurity Career Awareness Week is a celebration to focus local, regional, and national interest to inspire, educate and engage children through adults to pursue careers in cybersecurity.

Learn More:

nist.gov/nice/nccaw

Cyber Co-ops and Internships

*A partnership between UC,
employers, and students*

Vicki Baker

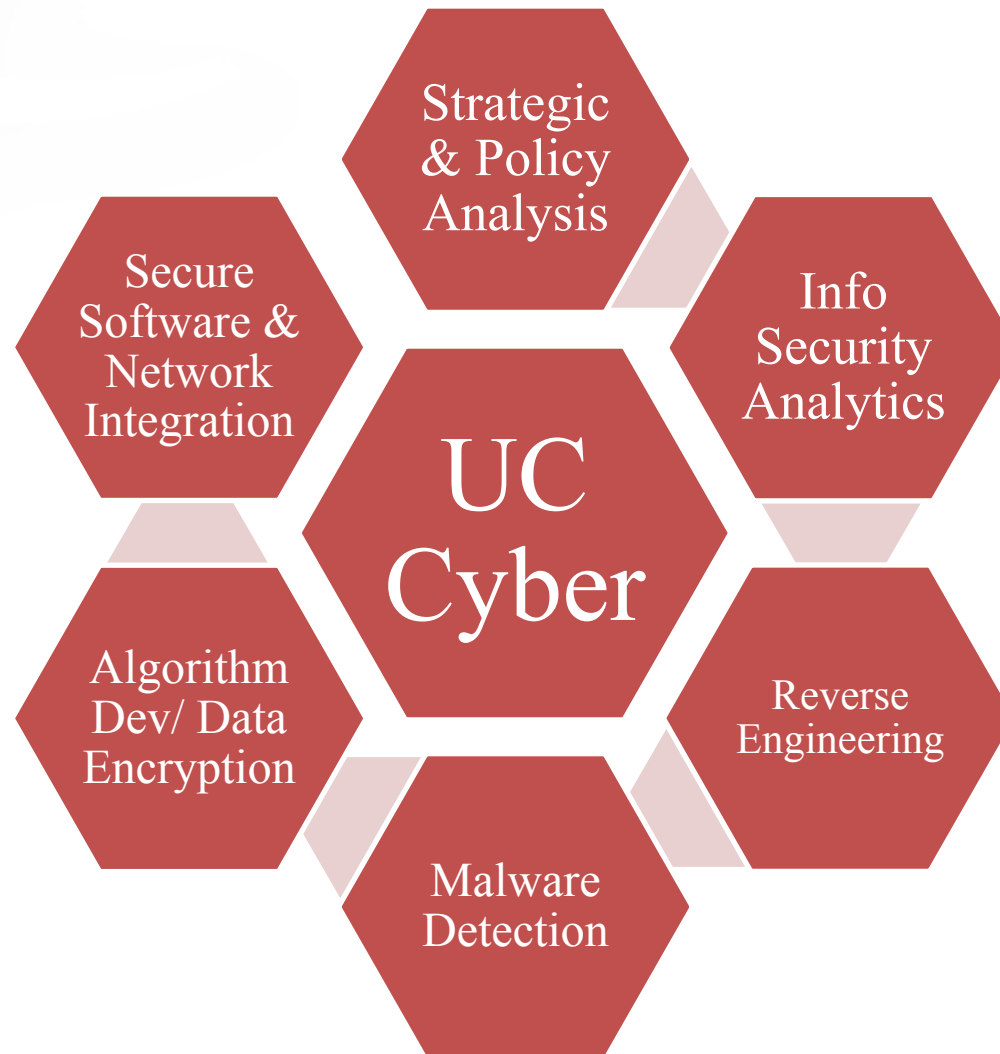
Director of Cyber Research Initiatives

UC Cyber: A Unique Multi-Disciplinary Approach

UC Cyber is a collaboration:

- College of Education, Criminal Justice & Human Services
 - School of Information Technology (SoIT)
 - Dept. of Criminal Justice
- College of Engineering and Applied Sciences
 - Dept. of Electrical Engineering & Computer Science
- College of Arts and Sciences
 - Dept. of Political Science
- UCIT (Information Technology)
- Army ROTC
- Office of Research

Faculty Expertise Across the Cyber Spectrum



Training the Next Cyber Workforce

Two Certificates

- Undergraduate Cybersecurity
- Graduate Cyber Operations

Bachelor's, Master's, and PhD degrees

- Bachelor of Science (BS) in either Information Technology or Computer Science, Cyber Track
- Bachelor of Science (BS) in Interdisciplinary Studies (Strategic Policy), Cyber track *[in development]*
- Master of Science (MS) in either Cyber Operations or Information Technology, Cyber track
- Doctoral Degree (PhD) in Computer Science & Engineering, Cyber Operations track
- Research at all educational levels

Applied Learning Through UC Co-ops and Internships

Division of Experience-Based Learning & Career Education

- Currently, 53 faculty & staff including specialists in job development.
- Co-ops are undergrad experiences & available year-round.
- Academic internships are offered to any student not required to complete a co-op
 - paid or unpaid and may receive credit.
- UC partners with local, regional, national, and international firms from 31 countries.
- Salaries range from \$11-\$23 per hour.



Mandated UG Academic Co-ops

- UC has been offering co-ops since 1906 and is largest program at any public institution in the U.S.
- UG students alternate semesters of classroom study with semesters of paid, on-site career-related experience.
- Beginning during second year, three to five semesters of co-op are required in cyber-related fields of computer science, computer engineering, electrical engineering, and information technology as a graduation requirement.
 - Students complete 2-3 courses intended to help them focus on their academic & professional development.
 - Faculty advise & lead reflections after each co-op experience.
 - Co-op employers are asked to evaluate student development and performance.

Building Bridges with Industry

PLACEMENTS PARTNERSHIPS

2017

Total Companies

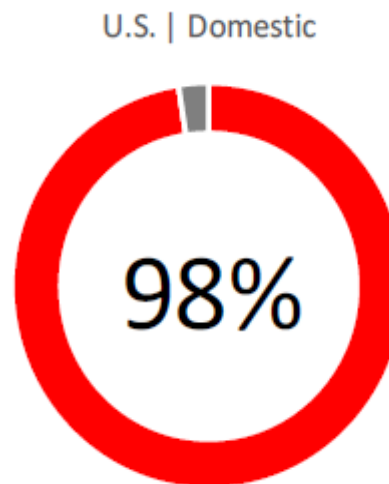
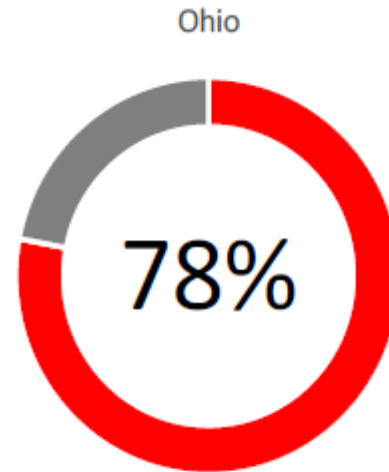
1,192

Actively Hiring

768 (64%)

New Employers

269 (23%)



Increase in co-op opportunities for international students.

All UC International students seeking a co-op are eligible to legally work in the U.S. (F1/J1)

Partnering with the UC Co-op program is simple.

A business create an 'PAL' account and post a position. When resumes/portfolios from interested students have been received, the business will be notified to review.

Academic Internships

- Prepares students for life after graduation.
- Work experiences look like a part-time job of 15 to 20 hours per week and is done in tandem with classes.
- Typically are one time, summer semester, on-site experiences.
- Two courses offered:

Exploring Academic Internships

Designed to prepare students to maximize learning through a career related internship and acquaint students with employer performance expectations.

Academic Internship Course

Investigates the applicability of students' studies in relationship to the requirements of a corporate employer in the format of a part-time domestic or international field experience.

ROI for Business

- **Cream Of The Crop:** Upon graduation, approx. 95% of UC co-op students have jobs immediately upon graduation.
 - 75% receive job offers from their co-op employers
- **Find Future Employees:** Year round recruiting tool
 - ongoing pipeline.
- **Better Retention:** Co-op/Interns have significantly greater retention rates after five years when compared to outside hires.
- **Test-Drive:** The best way to evaluate a potential employee is through an co-op/internship.
- **Inspire Your Best Thinkers:** Co-op/Interns bring fresh ideas and can work with your best employees to explore new territory.

Recommendations for Best Practices

- Insure work being completed is meaningful to the business and the student.
 - Schedule meetings to review work and check-in with faculty advisors.
- Same hiring standards as Full-Time Employees.
 - Increase conversion rate from co-op/intern to employee.
- Be aware of academic requirements of students.
 - Provide some flexibility for exams and other academic requirements.
 - Be open to registering co-op/internship with student's school.
- Incorporate students into in the team.
 - Increase connections to the company.
 - Enriches experience for everyone.

Resources

➤ UC Co-op/Internships:

<https://www.uc.edu/careereducation.html>

Q & A

UNIVERSITY *of* WASHINGTON

Cooperative Education Model

Experiential Learning for Emerging Professionals:

Accelerate the learning process and better prepare students to enter the
workforce prepared

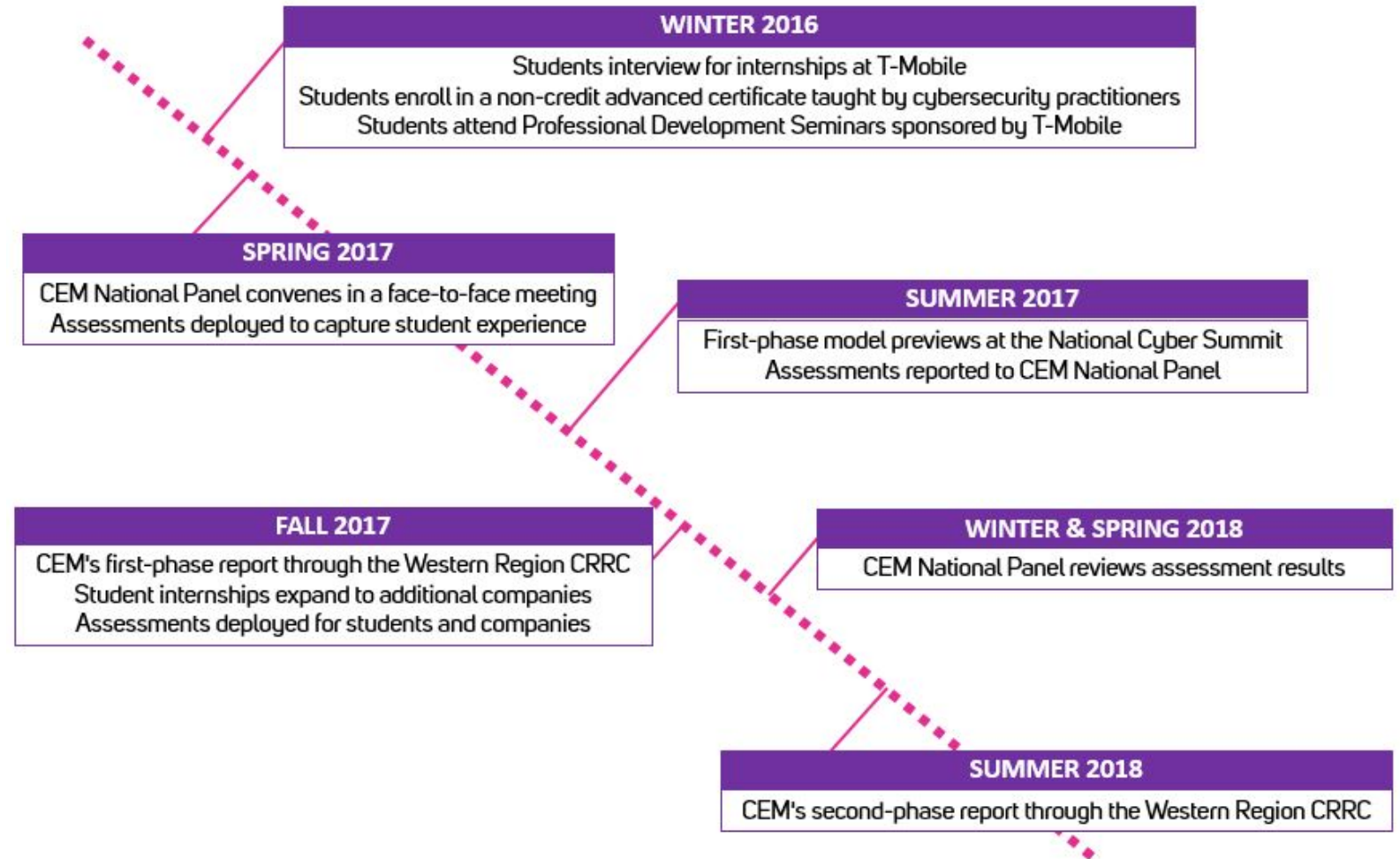
to be “breach ready.”

CENTER FOR INFORMATION ASSURANCE & CYBERSECURITY



Project Timeline & National Expert Panel

> Research & Action

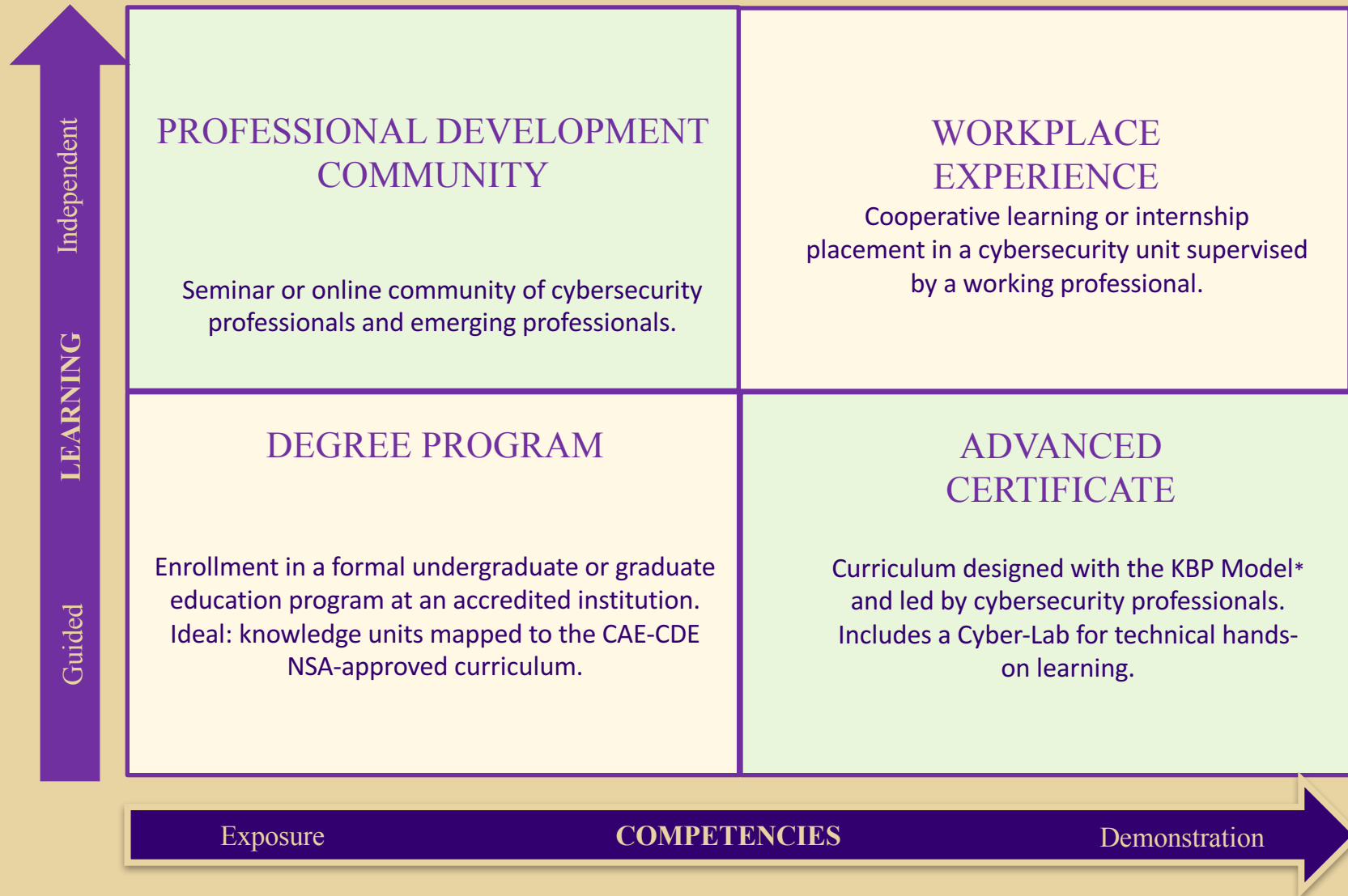


Expert Panel Theme

PANEL RESULTS & EMERGING THEMES



COOPERATIVE EDUCATION MODEL: DEVELOP STUDENTS AS PROFESSIONALS



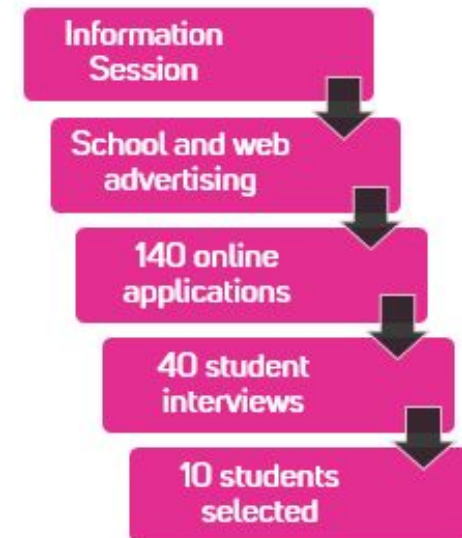
Source: *Kuzmina-Bespalko-Popovsky with Mbold, CEM Library

Corporate Perspective

T-Mobile – The UnCarrier



T-MOBILE RECRUITING PROCESS



T-MOBILE

WINTER 2016

Students:

- interview and selected for internships at T-Mobile
- enroll in a non-credit advanced certificate taught by cybersecurity practitioners
- attend T-Mobile Professional Development Seminars Student - receive career guidance and coaching from UW CIAC

| | | | |
|----------------------------|---|---|--|
| LEARNING ACTIVITIES | UW ISRM* CERTIFICATE Business context for cybersecurity NSA-Approved CAE-CDE* Coursework | UW ISRM CERTIFICATE Risk Management NSA-Approved CAE-CDE Coursework | UW ISRM CERTIFICATE Solving Problems NSA-Approved CAE-CDE Coursework |
| | Professional Development Seminar Sponsored by T-Mobile | Professional Development Seminar Sponsored by T-Mobile | Professional Development Seminar Sponsored by T-Mobile |
| | UW BOTHELL Academic class | T-MOBILE USA Paid Capstone Experience = UW Bothell Class Credit (optional) | T-MOBILE USA Paid Capstone Experience Possible opportunity to hire-on |
| | UW BOTHELL Academic class | UW BOTHELL Academic class | STUDENTS COMPLETE: 1. NSA-approved coursework 2. Professional Development Seminars 3. 6-months part-time work experience 4. Bachelor's or Master's Degree |
| | UW BOTHELL Academic class | UW BOTHELL Academic class | |

WINTER 2017

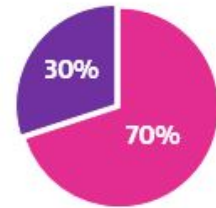
SPRING 2017

SUMMER 2017

OUTCOMES Year 1 & Cumulative

DEMOGRAPHICS

TYPE OF STUDY



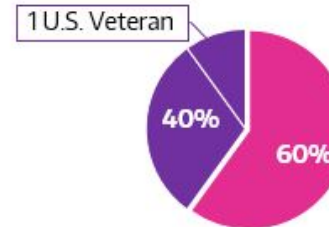
BUSINESS
COMPUTER SCIENCE/
ENGINEERING

DEGREE LEVEL



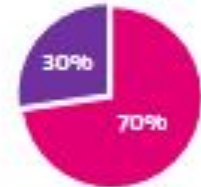
POST BAC / MASTERS
UNDERGRADUATE

GENDER



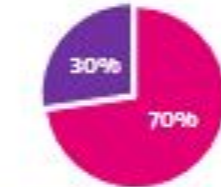
MALE
FEMALE

TYPE OF STUDY



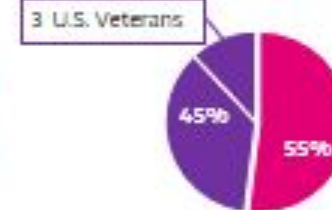
BUSINESS (non-CS)
COMPUTER SCIENCE/
ENGINEERING

DEGREE LEVEL



POST BAC / MASTERS
UNDERGRADUATE

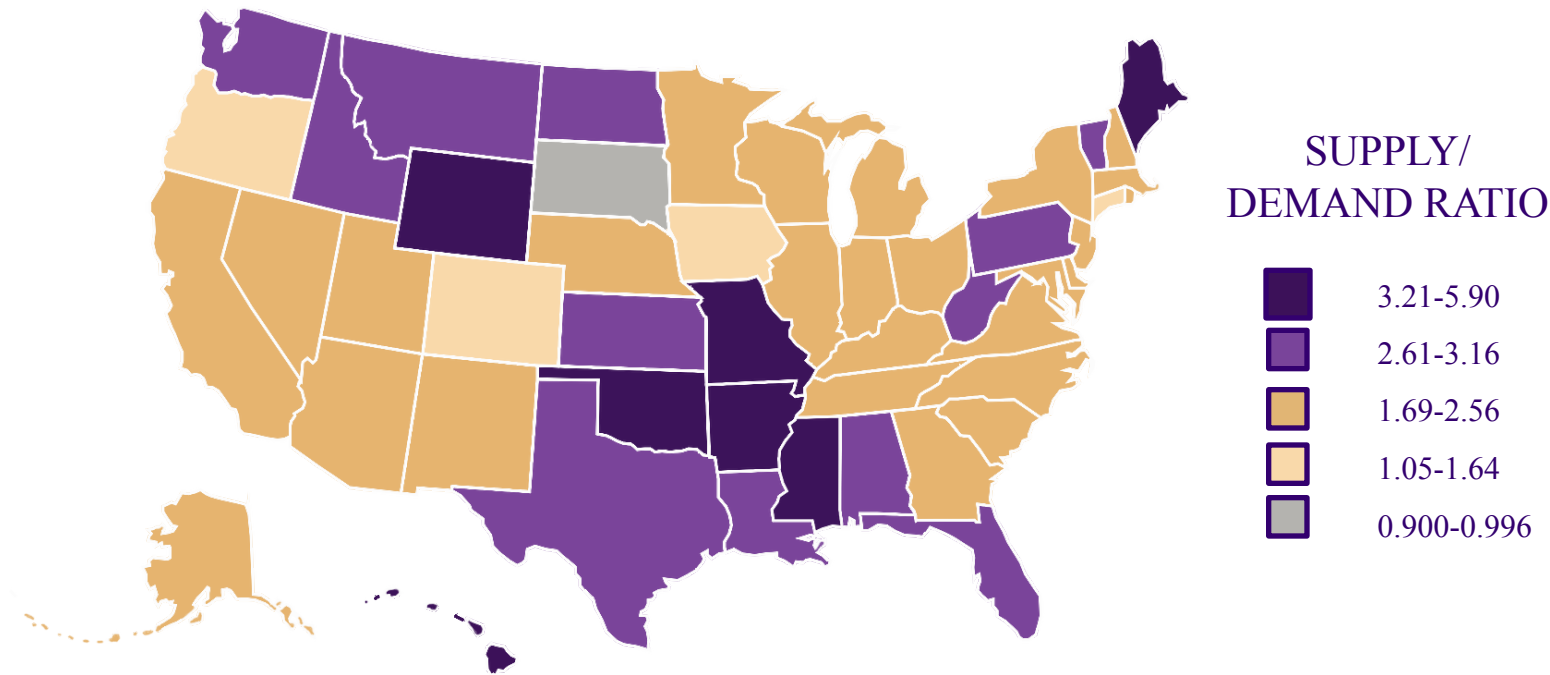
GENDER



MALE
FEMALE

The need for Breach Ready Experts in your state:

Industry calls for greater career readiness by recent graduates, as well as increased numbers of emerging cybersecurity professionals.



Resources

- > **Information Security Risk Management Certificate**
 - <https://www.pce.uw.edu/certificates/information-security-and-risk-management>
- > **Essentials of Cybersecurity**
 - <https://www.edx.org/professional-certificate/uwashingtonx-essentials-cybersecurity>
- > **Coop Cybersecurity Education Library**
 - <http://www.uwb.edu/ciac/industry>

Q & A



21st Century Apprenticeship and Cybersecurity

Joe Jenkins | Office of Apprenticeship

Apprenticeship is a “Win-Win-Win”

An industry driven method proven to attract, train and retain a highly skilled workforce

Businesses and Industry

- Create Highly Skilled Employees
- Increased Retention
- Recruitment Tool
- Attract women, minorities and veterans
- Access to Federal and State Resources
- Fill Vacant Positions

Apprentices

- Earn-As-You-Learn
- College Credit and Certifications
- Acquire a skill that leads to a career

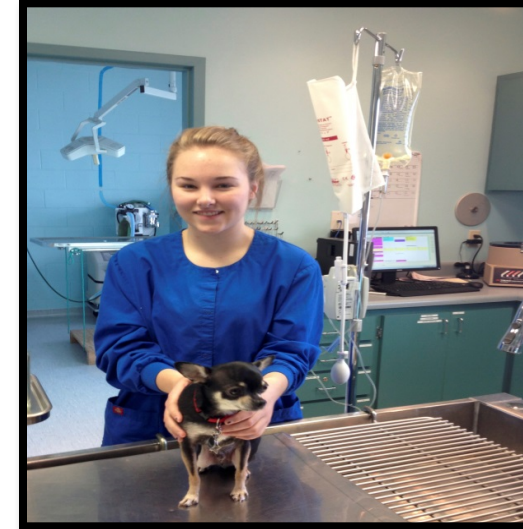
Educational Institutions

- Closer relationships with industry
- Articulation between apprenticeship and college programs ensures relevance and rigor
- Increased enrollment in credit classes by apprentices

Apprenticeship Extending into New Sectors

**Over 1,200 Apprenticeable occupations,
including new and emerging growth industries**

- Cybersecurity
- Financial Services
- Health Care
- Energy
- Advanced Manufacturing
- Information Technology
- Hospitality
- Biotechnology
- Aerospace
- Transportation
- Agriculture





Employer Involvement Is Integral

Employer is the foundation for the RA program and must be directly involved and provider of on-the-job training

Structured On-the-Job Training with Mentoring

Minimum of 2,000 hours
Structured and Supervised



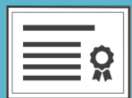
Related Training and Instruction

144 hours recommended per year
Parallel | Front-loaded | Segmented Options



Rewards for Skill Gains

Increases in skills brings about
increases in earnings



National Occupational Credential

Numbers Talk

Extraordinary Individual Outcomes

91% of Apprentices are [employed](#) after their program. Average starting wage is over \$50,000



Exciting Business Outcomes

An [international study](#) showed that for every dollar spent on apprenticeship training, an employer receives a benefit, on average, of \$1.47 from reduced turnover to greater productivity

Impressive Public Benefits

Every \$1 invested in Apprenticeship led to \$27 in tax [returns](#) for the Government*



*(Source: An Effectiveness Assessment and Cost-Benefit Analysis of Registered Apprenticeship in 10 States, Mathematica Policy Research, 2012)

How does Apprenticeship Benefit Employers?

- Helps business develop highly skilled employees
- Increases retention rates and productivity, and lowers the cost of recruitment
- Direct Cost Savings to Company – hire apprentices at lower salaries - as skills increase, wages increase
- Diversify workforce – attract veterans, women and minorities
- Gives companies an edge over their competition

How does Apprenticeship Benefit your Employees?

Hands-on Career Training

Practical on-the-job training in a wide variety of occupations and industries

An Education

Hands-on and technical training which has the potential to earn college credits

Long-term Career and Greater Earning Potential

Following apprenticeship completion

Little/No Education Debt

Apprenticeship = College Without the Debt

National Credential

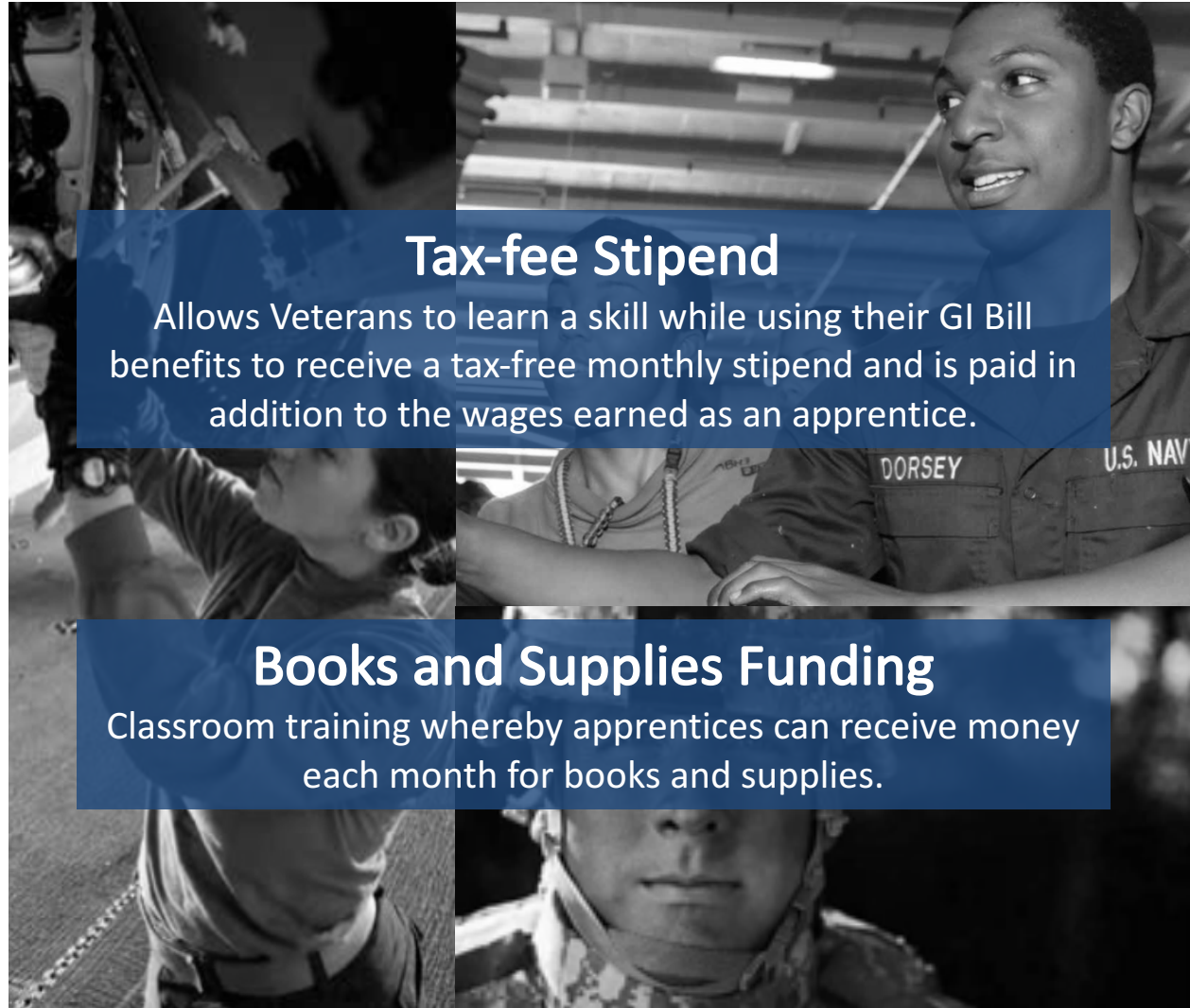
Upon graduation, a certified portable credential nationally recognized by industries and employers

How does Registered Apprenticeship Benefit Veterans?

Streamlining GI Bill Benefits for Apprentices



Through a partnership between the Departments of Veterans Affairs and Labor, employers now have a fast-track for their veteran employees to access their GI Bill benefits for registered apprenticeships.



Tax-free Stipend

Allows Veterans to learn a skill while using their GI Bill benefits to receive a tax-free monthly stipend and is paid in addition to the wages earned as an apprentice.

Books and Supplies Funding

Classroom training whereby apprentices can receive money each month for books and supplies.

Why register your program with US DOL?



Meet national standards for apprenticeship

- Symbol of quality and excellence



Connect with apprenticeship consultants

- Technical assistance, link to partners and resources

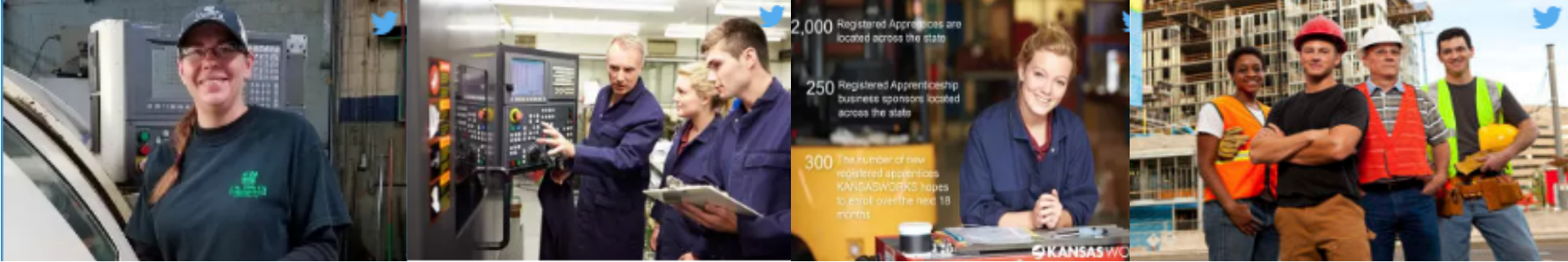


Access a range of federal and state benefits

- Preferred status for WIOA (Workforce Innovation and Opportunity Act)
- GI Bill benefits for qualified Veterans
- Educational benefits (e.g., Pell grants, others)
- State Tax Credits

National Apprenticeship Week 2017

November 13-19, 2017



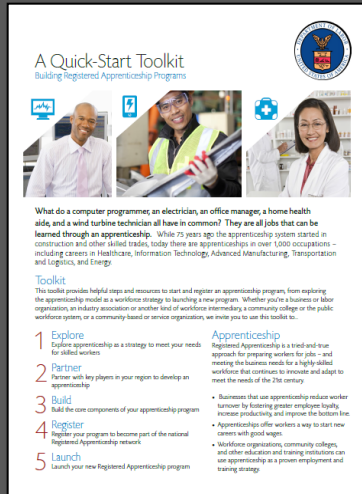
1,000 Events

2017 Target

www.dol.gov/apprenticeship/NAW



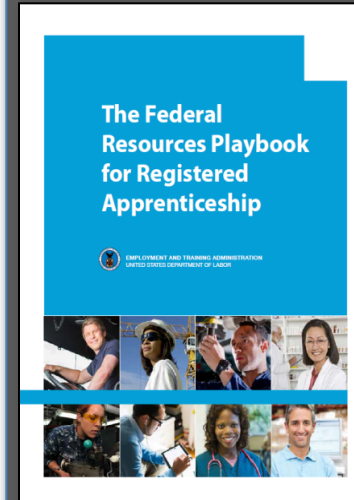
DOL.GOV/Apprenticeship Resources



Quick-Start Toolkit

5 Step Format to take you from “exploring” to “launching” a Registered Apprenticeship Program.

http://www.doleta.gov/oa/employers/apprenticeship_toolkit.pdf



Federal Resources Playbook

Guide to resources from various Federal Agencies to support Registered Apprenticeship.

<http://www.doleta.gov/oa/federalresources/playbook.pdf>



DOL Registration Site

An electronic apprenticeship standards builder that allows potential new sponsors to build and register their program online.

<http://www.doleta.gov/oa/registration/>



RACC Site

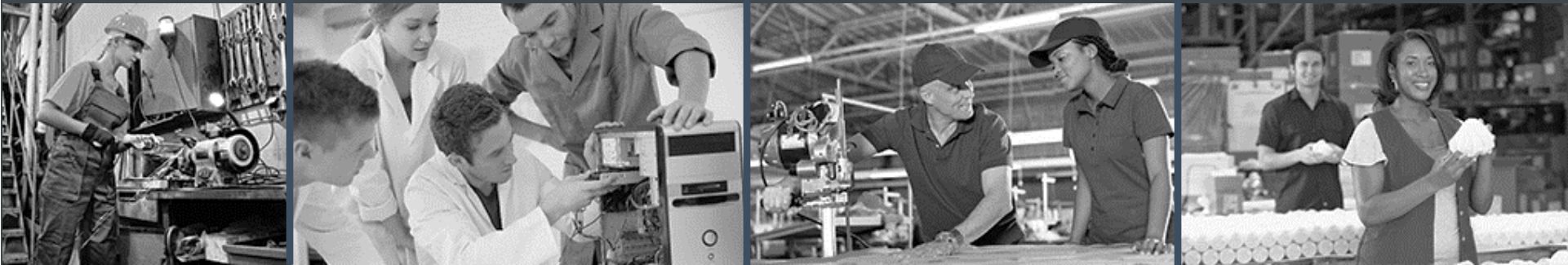
Find information on becoming a RACC member and a database of college members and sponsors.

<https://www.doleta.gov/oa/racc.cfm>



Joe Jenkins

Office of Apprenticeship | jenkins.joseph@dol.gov



Q & A

Thank You for Joining Us!

Upcoming Webinar: Writing Cybersecurity Position Descriptions for the Greatest Impact

When: Wednesday, January 17, 2018 at 2:00pm EST

Visit the event website [here](#) for more information.

Register: <https://nist-nice.adobeconnect.com/webinar-jan2018/event/registration.html>

nist.gov/nice/webinars