Developing Career-Relevant Academic Programs

A Case Study: UMUC's B.S. Program in Computer Networks & Cybersecurity

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Topics

- UMUC – History & Mission
- The CMIT Program – Origins
- New Approach to Program Development
- The CNAS Program – Rebirth
- The CNAS Program – Growth
- The CNAS Program – Future

Along the way:

- UMUC's approach to building new programs.
- Meeting Industry Needs while delivering academic Programs
- Recruit, motivate, and retain quality faculty

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UMUC – History & Mission

- Founded in 1947.

- Military heritage – first university to offer classes on military bases overseas; educating the U.S. Military since WW II.

- UMUC's mission: to "operate as Maryland's open university, serving working adults, military servicemen and servicewomen and their families, and veterans who reside in Maryland, across the U.S. and around the world."

- Dedicated to serving Adult Learners and Working Professionals.
- Global Leader in Distance and Online Education: 80,000+ Students and 180,000+ Alumni ; 150+ Worldwide locations.
- Regionally accredited institution, and member of the University System of Maryland.
- 90+ career-relevant programs (30+ Undergraduate, and 60+ Graduate), offered entirely online.

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UMUC World-wide Locations

US Locations (52)
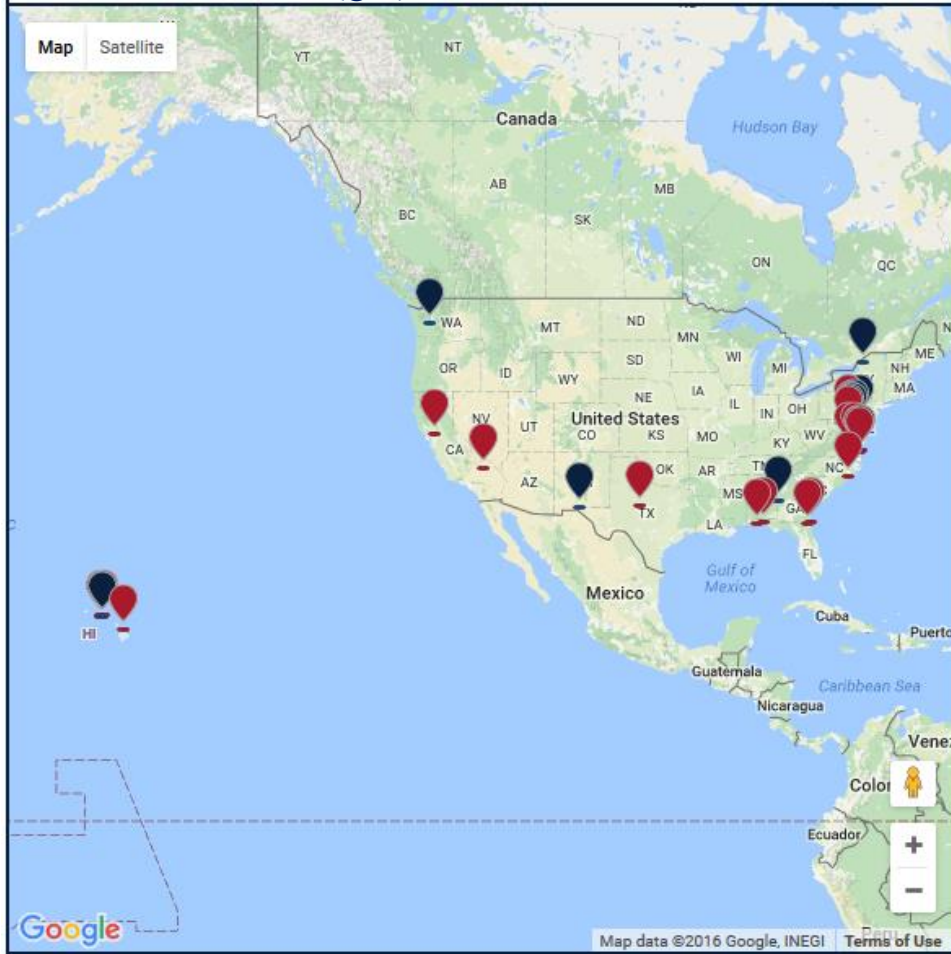
Asia Locations (33)

Europe Locations (52)

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Multiple Opportunities for Demonstrating Learning

Students can earn credit in a variety of ways:

- Taking a course at UMUC
- Transferring in equivalent course
- Challenge Exam
- Workplace Learning
- Prior Learning
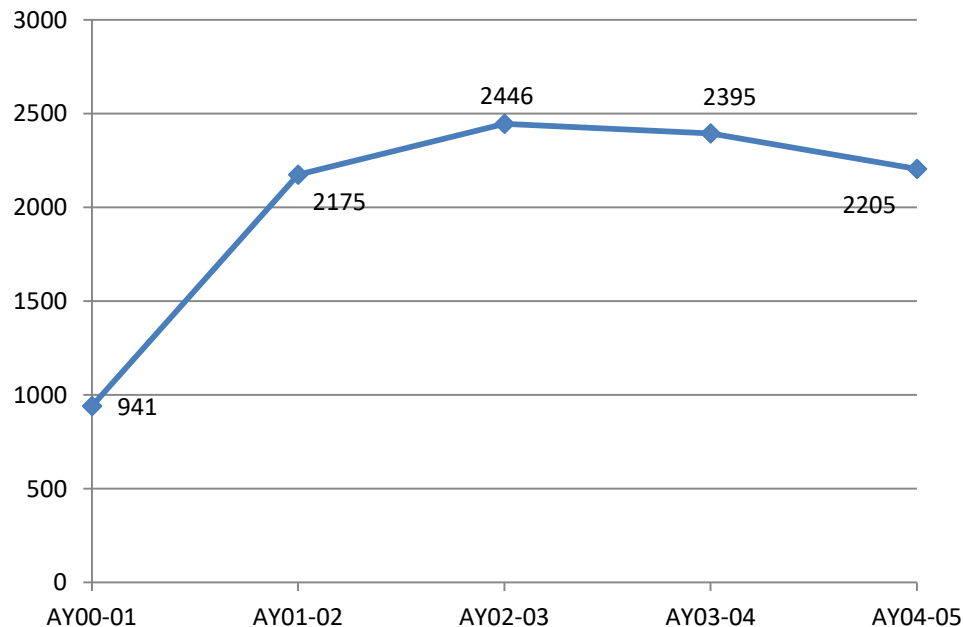
The CMIT Program – Birth (2000)

- CMIT: Computer Information Technology

- Statement from Fall 2000 Catalog:
  "…development of skills and education that workers need to succeed in high-demand employment categories such as network administration…"

- Focus on IT certifications – also impart more general skills/concepts.

- Initial Focus: Windows OS & Novell Networking certs.

- Program started with 7 courses

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The CMIT Program – Infancy (to 2005)

After 5 years:
- Cisco track (2001)
- 27 courses
- Certifications addressed: Network+, Security+, CCNA, Oracle, PL/SQL, SQL Server, Windows 2000, 2003, XP, Intro & Advanced Unix System Administration (Red Hat Linux)

Total Enrollments 2000-2005

	AY00-01	AY01-02	AY02-03	AY03-04	AY04-05
Enrollments	941	2175	2446	2395	2205

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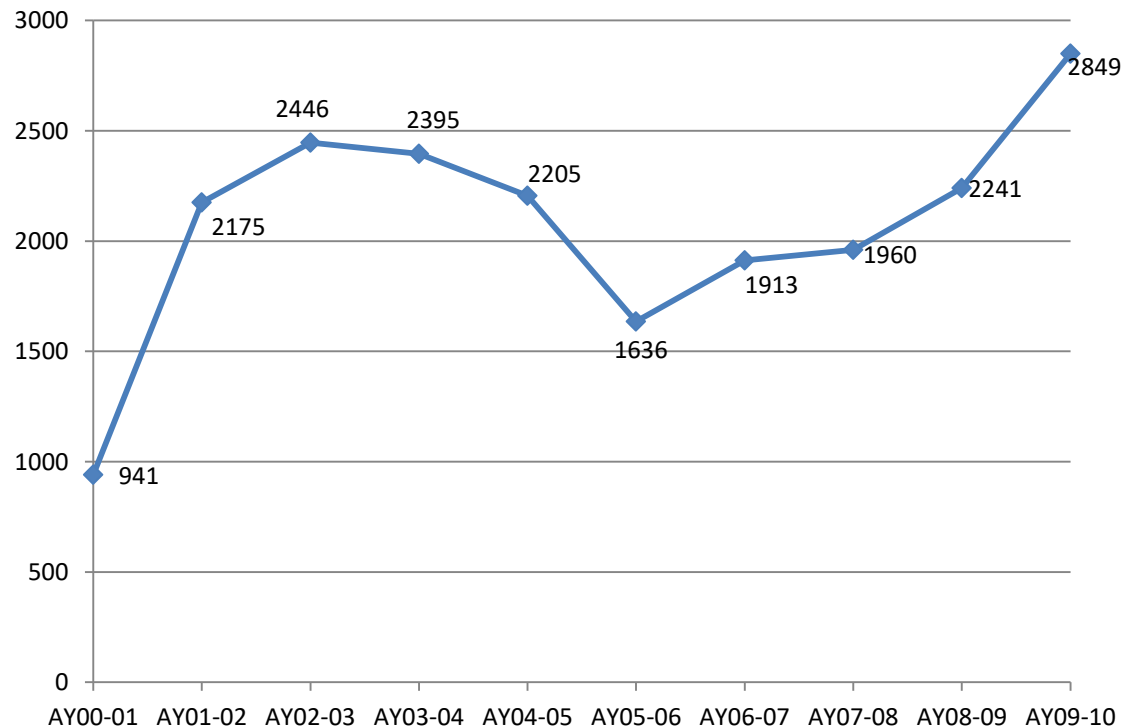University of Maryland
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The CMIT Program – Childhood (to 2010)

After the first 10 years:

- 23 courses
- New Certifications added: CEH, CISSP, Wireless Network Administration

Total Enrollments 2000-2010

AY00-01	941
AY01-02	2175
AY02-03	2446
AY03-04	2395
AY04-05	2205
AY05-06	1636
AY06-07	1913
AY07-08	1960
AY08-09	2241
AY09-10	2849

New Approach to Program Development

- Market Analysis & Environmental Scan

- Segue (Supporting Educational Goals for Undergraduate Excellence) started in 2009, and Delivered in 2010

- Key Goals:
  – All programs outcomes based
  – Curriculum design should be based on programs
  – 8 week sessions
  – Simplified (Straight Line) Pathways
  – Integrated Program- & Course-Level Assessment

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New Approach to Program Development

- Program Outcomes & Scope: Defined by external Advisory Group

- Career Tracks for Revised Program:
  - Network Administrator, Systems Administrator, IT Manager, Network Engineer, Network Security Administrator
  - Penetration tester
  - Digital Forensics Analyst

- Program renamed to CNAS. Focus on certifications related to Computer Networking and (Cyber)Security.

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New Approach to Program Development

Program Outcomes:
– Design, implement, and administer local-area and wide-area networks to satisfy organizational goals
– Resolve IT system problems and meet the needs of end users by applying troubleshooting methodologies
– Apply relevant policies and procedures to effectively secure and monitor IT systems
– Communicate IT knowledge effectively using a wide range of presentation styles
– Meet organizational goals using effective workforce skills, best practices, and ethical principles

- Program re-built to achieve outcomes.
- CNAS Program organized around Four areas:

  Microsoft
  Cisco Networking
  Network Security
  Digital Forensics

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The CNAS Program - Now

Program Structure: 33 Credits

Core (18 Credits)
>   Fundamentals of Computer Troubleshooting
>   Fundamentals of Networking
>   Network Security
>   Interconnecting Cisco Devices
>   Installing and Configuring Windows Server
>   Linux Server

Area Of Concentration (12 Credits. Choose ONE:)

Microsoft	Network Security
Digital Forensics	CISCO

Capstone (3 credits)

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The CNAS Program – IT Certifications Addressed

Core:
- CompTIA A+
- CompTIA Network+
- CompTIA Security+
- Cisco CCNA
- Windows Server
- Linux Server Professional (LPIC-1)

Network Security:
- Certified Ethical Hacker (CEH)
- Certified Information Systems Security Professional (CISSP)

Microsoft:
- Microsoft Certified Solutions Expert (MCSE)

Cisco:
- Cisco Certified Network Associate (CCNA)
- Cisco Certified Network Professional (CCNP)
- CCNA Security

Forensics:
- Certified Computer Examiner (CCE)
- Computer Security Incident Handler (CSIH)
- Mobile Forensic Certified Examiner (MFCE)

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The CNAS Program – Key Drivers

- Regular meetings with Advisory Group
- Track & Monitor Certifications
- Track Major Drivers: DoD 8570/8140, NIST (NICE) Workforce Development Framework
- Academic Partnerships: with Cisco, MS, EC-Council, COMP-TIAA etc.
- Participation in Cyber Competitions
- Become a Preferred Provider of Education for major institutions (e.g. OPM, BAH, Northrop-Grumann, CACI, ManTech etc.)

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Cybersecurity related Accreditations

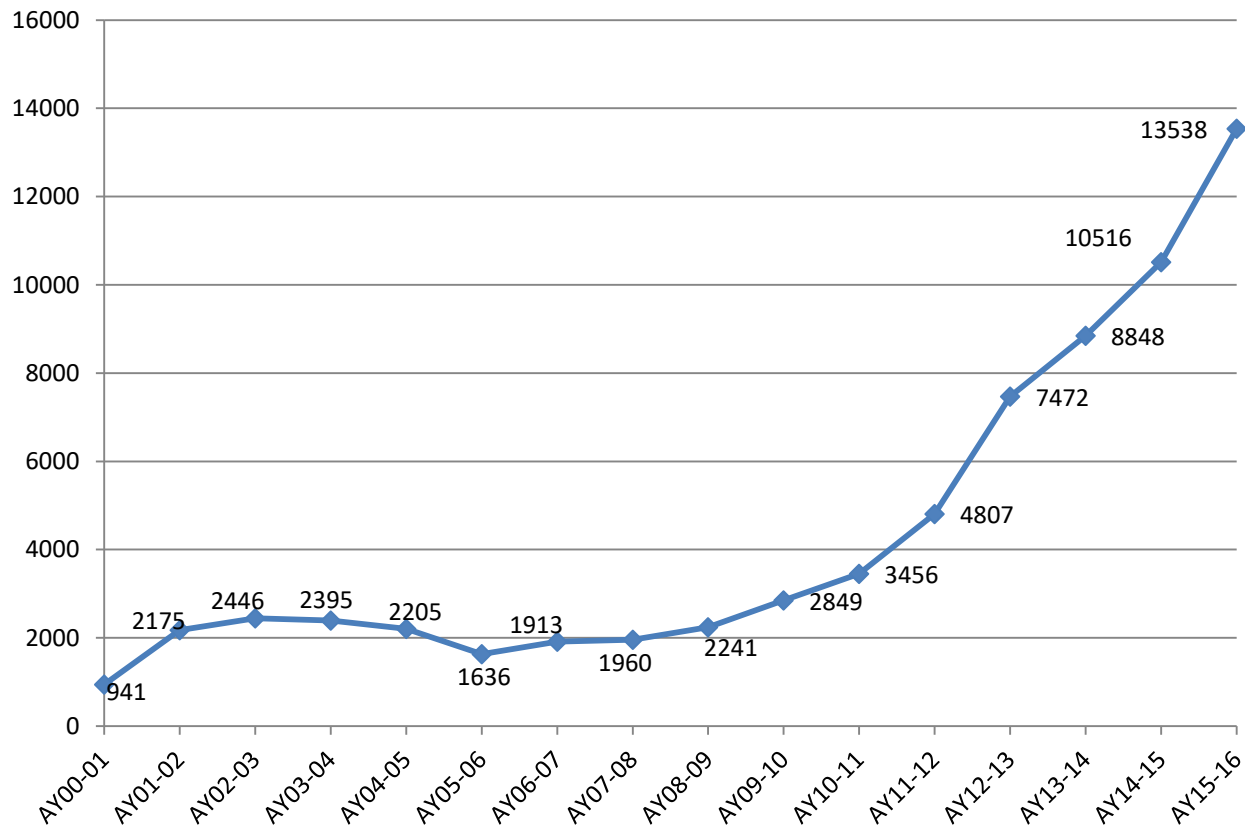|	
Member of DoD Cyber Crime Center (DC3) Academic Cyber Curriculum Alliance Board	MEMBER OF THE DC3 ACADEMIC CYBER CURRICULUM ALLIANCE
Certified as Center of Digital Forensics Academic Excellence	
Re-Certified as Center of Academic Excellence in Information Assurance / Cyber Defense	
Member of National CyberWatch	NATIONAL CYBERWATCH CENTER

The CNAS Program Now – Enrollment Growth

After 16 Years:
20 courses

Total Enrollments 2000-2016

Data points:
- AY00-01: 941
- AY01-02: 2175
- AY02-03: 2446
- AY03-04: 2395
- AY04-05: 2205
- AY05-06: 1636
- AY06-07: 1913
- AY07-08: 1960
- AY08-09: 2241
- AY09-10: 2849
- AY10-11: 3456
- AY11-12: 4807
- AY12-13: 7472
- AY13-14: 8848
- AY14-15: 10516
- AY15-16: 13538

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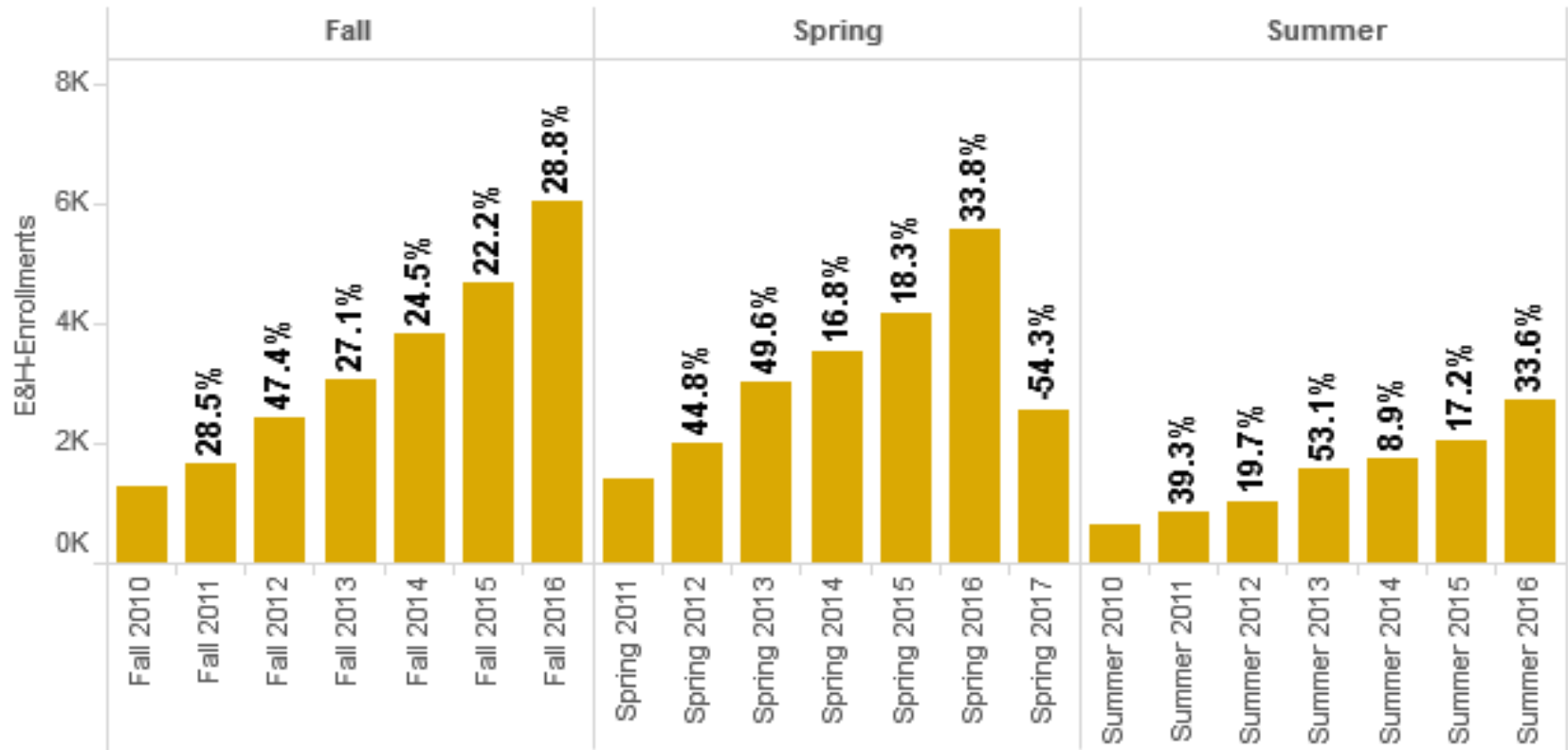University College

The CNAS Program - Headcounts

Headcount by Term
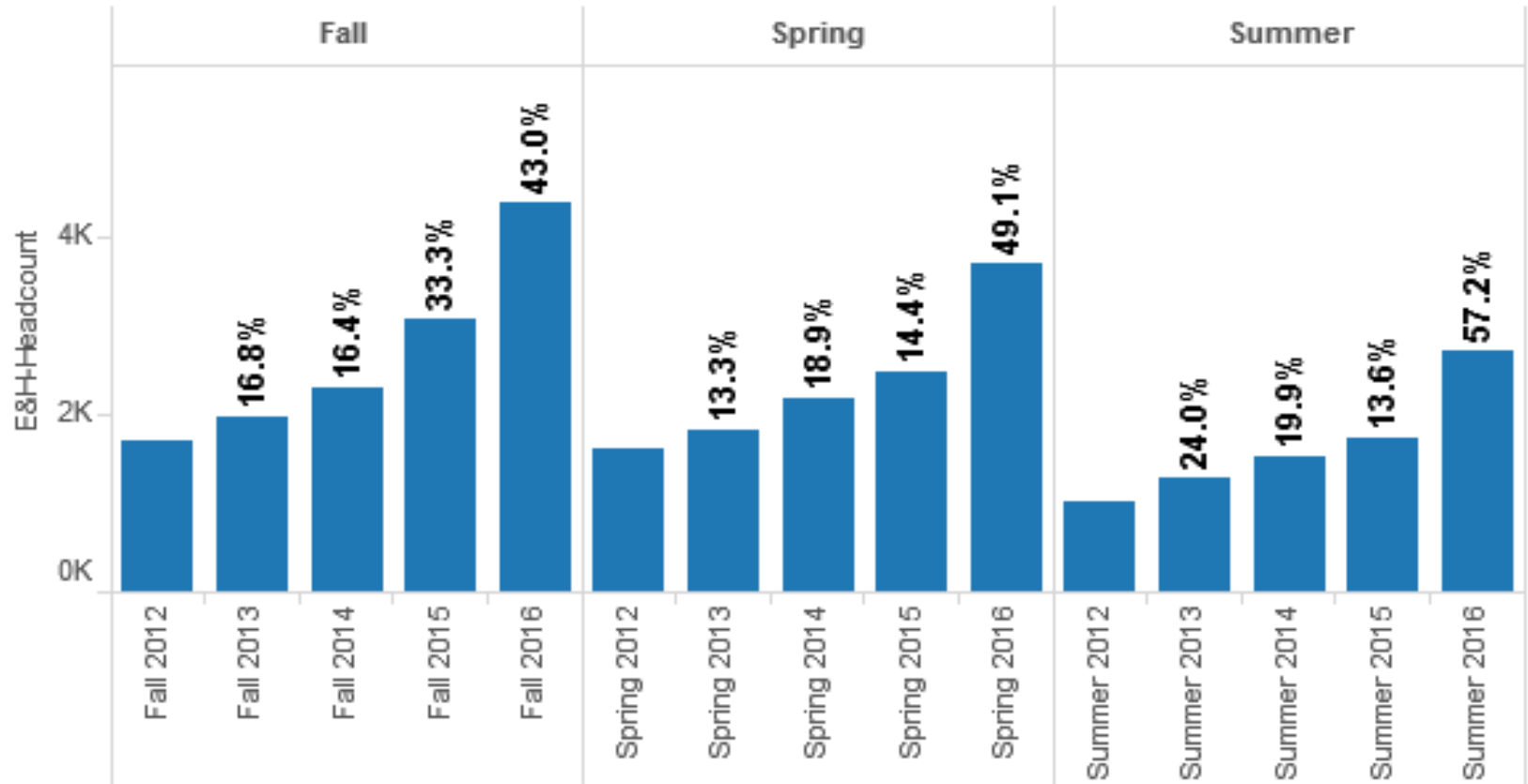
The CNAS Program - Enrollments

Enrollment by Term

Building an effective Faculty Pool

Faculty:

- 200+ faculty (almost all adjunct) led by a Program Chair
- Collegiate faculty
- Adjunct faculty work as SysAdmins, Network Engineers, Pen-testers, Forensics Analysts, CIOs etc.

Qualifications, Hiring:

- Masters degree, corresponding certification, current Industry Experience: all needed
- In Interviews: look for people who have a passion for teaching, disciplined.

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Building an effective Faculty Pool

Evaluation, Promotions

- Faculty promoted on a 3 yr, 30 sh cycle.
- Routinely monitor online classes, student comments & evals

Faculty Support

- Mentoring for new faculty
- Mandatory training for teaching online and hybrid classes.
- Special training for faculty teaching military learners.
- Model classrooms
- Course Chairs
- Online faculty meetings twice a year.

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The CNAS Program – The Future

- Competency-Based Curriculum
- Linux Track
- Accelerated Pathway to Graduate Degrees
- Suggestions needed: System Administration

Questions

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