



# New Academic Program Workflow Form

## General

**Proposed Name: Signals Intel & Elec Warfare**

Transaction Nbr: 00000000000236

Plan Type: Specialization

Academic Career: Undergraduate

Degree Offered: Undergraduate Certificate

Do you want to offer a minor? N

Anticipated 1st Admission Term: Fall 2025

## Details

Department(s):

### UAZS

DEPTMNT ID	DEPARTMENT NAME	HOST
2910	College of Applied Science and Technology	Y

Campus(es):

### MAIN

LOCATION	DESCRIPTION
TUCSON	Tucson

### ONLN

LOCATION	DESCRIPTION
ONLN	Online

**Admission application terms for this plan:** Spring: Y Summer: Y Fall: Y

**Plan admission types:**

Freshman: Y Transfer: Y Readmit: Y Graduate: N

Non Degree Certificate (UCRT only): Y

Other (For Community Campus specifics): N

**Plan Taxonomy:** 29.0299, Intelligence, Command Control and Information Operations, Other.

Program Length Type: Program Length Value: 0.00

Report as NSC Program:

SULA Special Program:

**Print Option:**

Diploma: Y Signals Intelligence and Electronic Warfare

Transcript: Y Signals Intelligence and Electronic Warfare

**Conditions for Admission/Declaration for this Major:**

n/a

**Requirements for Accreditation:**

n/a

**Program Comparisons**

**University Appropriateness**

There are very few programs in higher education for Signals Intelligence (SIGINT) and/or Electronic Warfare. The U of A, with strong military relationships in Fort Huachuca and Davis Monthan, and CAST's NSA CAE-CO designation align with this certificate. Our program will utilize CAST's unique and state-of-the-art Cyber Virtual Learning Environment (VLE). The academic and research content of the VLE is built around Cyberapolis, a virtual world where students learn and practice both their skills. The VLE is an unstructured, synthetic, live environment designed to replicate the real internet; providing a realistic, non-scripted platform that forces students to synthesize and apply what they learn. The VLE will also aid in training simulations for this particular contract with the Army.

**Arizona University System**

NBR	PROGRAM	DEGREE	#STDNTS	LOCATION	ACCRDT
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**Peer Comparison**

There are very few programs in higher education for Signals Intelligence (SIGINT) and/or Electronic Warfare. American Military University typically offers programs that provide pathways to military and government careers. However, they do not currently offer this specialized certificate at the undergraduate level. Georgia Tech offers their program in partnership with the Georgia Tech

Research Institute (GTRI), which is a university affiliated, nonprofit, applied research center of Georgia Tech that has various research labs across the country. Much of the GTRI research focuses on cybersecurity, defense technology, and military/government operations.

## Resources

### Library

Acquisitions Needed:

### Physical Facilities & Equipment

Existing Physical Facilities:

N/A

Additional Facilities Required & Anticipated:

N/A

### Other Support

Other Support Currently Available:

This fully funded certificate is part of a contract with the Army. Current staff (Advising, Career, Recruitment, etc.) and faculty exist to support the implementation, and funding is provided if needed to hire.

Other Support Needed over the Next Three Years:

Fully funded, TBD

## Comments During Approval Process

10/14/2024 1:36 PM

NICOLER

Comments
Approved.

10/14/2024 3:01 PM

MELANIECMADDEN

Comments
Approved.

10/14/2024 3:04 PM

DHERRING

Comments
Approved.



NEW ACADEMIC PROGRAM – CERTIFICATE (Undergraduate)

CURRICULAR INFORMATION

I. CERTIFICATE DESCRIPTION–

The Certificate in Signals Intelligence & Electronic Warfare is designed to equip students with essential skills and knowledge for careers in Signals Intelligence (SIGINT) and electronic warfare (EW). This certificate integrates foundational coursework in network analysis, wireless networking, Radio Frequency (RF) analysis, and digital signal processing to provide a comprehensive understanding of both RF and protocol fundamentals. Students will gain hands-on experience in analyzing and securing communication networks, mastering modulation and keying techniques, and applying SIGINT and EW principles. The program prepares graduates for roles in military, defense, cybersecurity, and intelligence sectors, offering a strong basis for further academic or professional advancement in these critical fields.

II. NEED FOR THE CERTIFICATE/JUSTIFICATION -

The College of Applied Science and Technology is launching a strategic initiative with the Army to address the critical need for unclassified Signals Intelligence (SIGINT) and Electronic Warfare (EW) training and education. Current classified training models are limited, restricting skill sustainment and refreshment primarily to servicemembers. Our efforts will expand the pool of highly skilled SIGINT/EW professionals by providing a robust pathway for both military and civilian personnel. Developing academic programs is part of this initiative. These programs are designed to provide both foundational and advanced training, offering soldiers and civilians opportunities to earn professional credentials. This new SIGINT/EW undergraduate certificate is proposed alongside a new SIGINT/EW emphasis in the IIO major. The period of performance for this effort is ten (10) years beginning in FY25 (launch of the academic programs) and running through FY35 at approximately \$19,648,367.29 for the first five years and approximately \$18,312,132.12 for the second five years for a total of approximately \$37,960,499.41. Confidential Letter of Intent (LoI) available to show individuals upon request.

III. VIABILITY: This program is fully funded (~\$38M/10 years) by a partnership with the Army. See above information.

- a. Summarize new resources required to offer the certificate: Advisors and possible faculty have been added to the overall amount of funding from the Army for the last 5 years. Until then, our existing faculty and staff resources can support the proposed certificate. However, if demand is high, we can deploy resources to support expansion early using the funds.

IV. PROGRAM AFFILIATION-

The UA does not offer an affiliate program.

V. PROJECTED ENROLLMENT: You will need to provide evidence to support the projection (i.e., student/alum surveys, enrollment in existing courses, peer programs, etc.).

Enrollment is based on partnership and funding with the Army:

Year 1	Year 2	Year 3
25	50	100

VI. CERTIFICATE REQUIREMENTS–



NEW ACADEMIC PROGRAM – CERTIFICATE (Undergraduate)

CURRICULAR INFORMATION

UNDERGRADUATE CERTIFICATE

Minimum total units required	18
Minimum upper division units	6
Total transfer units that may apply to the certificate. <i>Note: A minimum of six (6) units used to complete the certificate must be University credit.</i>	12
Pre-admissions expectations	N/A
Certificate requirements.	Complete 18 units of coursework:  CYBV 326 (3) Introductory Methods of Network Analysis  CYBV 479 (3) Wireless Networking & Security  INTV 210 (3) Fundamentals of Radio Frequency Analysis (NEW)  INTV 220 (3) Analog and Digital Signals (NEW)  INTV 230 (3) Modulation and Keying (NEW)  INTV 240 (3) Principles of Signals Intelligence and Electronic Warfare (NEW)
Internship, practicum, applied course requirements (Yes/No). If yes, provide description.	No
Any double-dipping restrictions (Yes/No)? If yes, provide description.	Yes, students may apply 9 units towards major or minor.
Additional requirements (provide description)	N/A

VII. CURRENT COURSES–

Course prefix and number	Units	Title	Pre-requisites	Modes of Delivery	Campus and Location Offered	Dept signed party to proposal? (Yes/No)
CYBV 326	3	Introductory Methods of Network Analysis	None	Online, in-person	Main, AZOnline	Yes
CYBV 479	3	Wireless Networking & Security	CYBV 326	Online, in-person	Main, AZOnline	Yes

VIII. LEARNING OUTCOMES AND CURRICULUM MAP -

Learning Outcomes



NEW ACADEMIC PROGRAM – CERTIFICATE (Undergraduate)

CURRICULAR INFORMATION

Learning Outcome #1: Analyze and apply radio frequency and protocol analytical techniques to identify and exploit signals of interests.
Concepts: Radio Frequency Fundamentals, Protocol Analysis, Signal of Interest Decomposition & Analysis
Competencies: Radio Frequency Analysis, Identification of Signals for intelligence
Learning Outcome #2: Explain and demonstrate how to use the principles of SIGINT and EW to support strategic and operational decision making.
Concepts: Radio Frequency Fundamentals, Spectrum Analysis, Wave & Signal Propagation, Modulation & Keying, Protocol Analysis, Signal of Interest Decomposition & Analysis
Competencies: Spectrum Survey & Analysis, Signal Identification, Signal Filtering, Signal Extraction, Demodulation, Decoding, Internals & Externals Analysis, Signal Decomposition.

**Curriculum Map**

	CYBV 326	CYBV 479	INTV 240	INTV 230	INTV 220	INTV 210
LO #1:	R	M	R	R	R	I
LO #2:	R	M	R	R	R	I

IX. CONTACTS AND ADMINISTRATION

**UNDERGRADUATE** (delete if n/a)

- a. List the name and contact information for the primary point of contact for the certificate:

IIO Program Director Jason Denno ([jasondenno@arizona.edu](mailto:jasondenno@arizona.edu))

- b. List the name and contact information for the person or persons who will serve in the role of Director of Undergraduate Studies (DUS) for the certificate (this is not always the same as the DUS for affiliated programs or head of the managing academic unit.):

IIO Program Director Jason Denno ([jasondenno@arizona.edu](mailto:jasondenno@arizona.edu))

- c. If known, list the members of the certificate oversight committee for this certificate. Note: undergraduate certificate oversight committees shall consist of a minimum of 3 members, 2 of which are faculty and at least one of the 2 is participating faculty in the certificate program. The oversight committee is responsible for 1) qualifications of participating faculty, 2) coordination of admissions recommendations with the Office of Admissions, and 3) curricular changes:

Jason Denno, Craig Nazareth, Josh Pauli



NEW ACADEMIC PROGRAM – CERTIFICATE (Undergraduate)

CURRICULAR INFORMATION

X. REQUIRED SIGNATURES

Main Proposer (print name and title): Dr. Nicole Kontak, Assistant Dean

Main Proposer signature: *Nicole Kontak*

Date: 10/11/2024

Department Head (print name and title): Dr. Josh Pauli

Department Head's signature: *J. Pauli*

Date: Oct 11, 2024

Associate Dean (print name): Dr. Linda Denno

Associate Dean's signature: *Linda Denno*

Date: Oct 11, 2024

Dean (print name): Dr. Nic Rae

Dean's signature: *Nicol Rae*

Date: Oct 11, 2024





NEW ACADEMIC PROGRAM – CERTIFICATE ([Undergraduate](#) or [Graduate](#))

## CURRICULAR INFORMATION












# New Acad Prgm\_ SIGINT UCERT

Final Audit Report

2024-10-11

Created:	2024-10-11
By:	Nicole Kontak (nicoler@arizona.edu)
Status:	Signed
Transaction ID:	CBJCHBCAABAAEIsH7GLI018Kw-5ViJAVh0EoVJc7FMB

## "New Acad Prgm\_ SIGINT UCERT" History

-  Document created by Nicole Kontak (nicoler@arizona.edu)  
2024-10-11 - 5:08:00 PM GMT- IP address: 69.242.224.236
-  Document emailed to Josh Pauli (jjpauli@arizona.edu) for signature  
2024-10-11 - 5:09:48 PM GMT
-  Email viewed by Josh Pauli (jjpauli@arizona.edu)  
2024-10-11 - 5:29:31 PM GMT- IP address: 184.83.253.67
-  Document e-signed by Josh Pauli (jjpauli@arizona.edu)  
Signature Date: 2024-10-11 - 5:30:56 PM GMT - Time Source: server- IP address: 184.83.253.67
-  Document emailed to Linda Denno (ldenno@arizona.edu) for signature  
2024-10-11 - 5:30:58 PM GMT
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-  Document e-signed by Linda Denno (ldenno@arizona.edu)  
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-  Document emailed to Nicol Rae (nicolrae@arizona.edu) for signature  
2024-10-11 - 5:35:50 PM GMT
-  Email viewed by Nicol Rae (nicolrae@arizona.edu)  
2024-10-11 - 5:42:00 PM GMT- IP address: 150.135.165.101
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Signature Date: 2024-10-11 - 5:42:30 PM GMT - Time Source: server- IP address: 150.135.165.101
-  Agreement completed.  
2024-10-11 - 5:42:30 PM GMT



**BUDGET PROJECTION FORM**

**Name of Proposed Program or Unit:**

Budget Contact Person:	Projected		
	1st Year 2025 - 2026	2nd Year 2026 - 2027	3rd Year 2027 - 2028

METRICS	1st Year 2025 - 2026	2nd Year 2026 - 2027	3rd Year 2027 - 2028
Net increase in annual college enrollment UG	25	50	100
Net increase in college SCH UG	450	1,200	2,400
Number of enrollments being charged a Program Fee	-	-	-
New Sponsored Activity (MTDC)	\$5,000,000.00	\$4,700,000.00	\$4,500,000.00
Number of Faculty FTE	4	6	6

**FUNDING SOURCES**

<b>Continuing Sources</b>			
UG AIB Revenue			
Grad AIB Revenue			
Program Fee Revenue (net of revenue sharing)			
F and A AIB Revenues			
Reallocation from existing College funds (attach description)			
Other Items (attach description)			
<b>Total Continuing</b>	\$ -	\$ -	\$ -

<b>One-time Sources</b>			
College fund balances			
Institutional Strategic Investment	-	-	-
Gift Funding	-	-	-
Other Items (attach description)	\$5,000,000.00	\$4,700,000.00	\$4,500,000.00
<b>Total One-time</b>	\$ 5,000,000	\$ 4,700,000	\$ 4,500,000

<b>TOTAL SOURCES</b>	\$ 5,000,000	\$ 4,700,000	\$ 4,500,000
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**EXPENDITURE ITEMS**

<b>Continuing Expenditures</b>			
Faculty	\$300,000.00	\$450,000.00	\$450,000.00
Other Personnel	\$45,000.00	\$45,000.00	\$45,000.00
Employee Related Expense	\$0.00	\$0.00	\$0.00
Operations (materials, supplies, phones, etc.)	\$0.00	\$0.00	\$0.00
Additional Space Cost	\$0.00	\$0.00	\$0.00
Other Items (attach description)	\$0.00	\$0.00	\$0.00
<b>Total Continuing</b>	\$ 345,000	\$ 495,000	\$ 495,000

<b>One-time Expenditures</b>			
Construction or Renovation	-	-	-
Start-up Equipment	-	-	-
Replace Equipment	-	-	-
Library Resources	-	-	-
Other Items (attach description)	-	-	-
<b>Total One-time</b>	\$ -	\$ -	\$ -

<b>TOTAL EXPENDITURES</b>	\$ 345,000	\$ 495,000	\$ 495,000
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<b>Net Projected Fiscal Effect</b>	\$ 4,655,000	\$ 4,205,000	\$ 4,005,000
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**New Academic Program  
PEER COMPARISON**

Program name, degree, and institution	Proposed UA Program: Undergraduate Certificate in Signals Intelligence and Electronic Warfare	American Military University: Graduate Certificate in Counterintelligence	Georgia Tech: Electromagnetic Warfare Technology Certificate
Current number of students enrolled			
Program Description	<p>The Certificate in Signals Intelligence &amp; Electronic Warfare program equips students with essential skills and knowledge for careers in Signals Intelligence (SIGINT) and Electronic Warfare (EW). This certificate integrates foundational coursework in network analysis, wireless networking, Radio Frequency (RF) analysis, and digital signal processing to provide a comprehensive understanding of both RF and protocol fundamentals. Students will gain hands-on experience in analyzing and securing communication networks, mastering modulation and keying techniques, and applying SIGINT and EW principles. The program prepares graduates</p>	<p>The counterintelligence graduate certificate program at American Military University (AMU) offers a robust curriculum influenced by AMU's expertise in U.S. and corporate intelligence and security. Counterintelligence certification is becoming increasingly popular. This program may be suitable as preparation for such certification, building your knowledge in:</p> <ul style="list-style-type: none"> <li>• Signals intelligence</li> <li>• Human intelligence</li> <li>• Intelligence profiling</li> </ul> <p>As a student in AMU's online counterintelligence certificate program, you'll gain threat-analysis knowledge and learn about the latest counterintelligence research</p>	<p>Understand how electronic warfare systems work and how they are utilized in modern military applications. This certificate is designed for people who work with electronic warfare and/or the design or operations of radar systems, including engineers, managers, and technologists involved in the system's testing, development, procurement, and evaluation.</p> <ul style="list-style-type: none"> <li>• Build your proficiency with the latest electronic warfare technology and make an immediate impact on your team, your work, and your career.</li> <li>• Establish and deepen contacts with experts,</li> </ul>

	for roles in military, defense, cybersecurity, and intelligence sectors, offering a strong basis for further academic or professional advancement in these critical fields.	methods and tools. Faculty share their real-world experience from government, intelligence, defense, and policy sectors.	peers, and others throughout industry and government. <ul style="list-style-type: none"> <li>• Earn a recognized industry credential.</li> </ul>
Target Careers	Government, Military, Industry	Government, Military, Industry	Government, Military, Industry
Emphases? (Yes/No) List, if applicable	No	No	No
Minimum # of units required	18	18	18
Special requirements to declare/gain admission? (i.e. pre-requisites, GPA, application, etc.)	N/A	N/A	N/A
Internship, practicum, or applied/experiential requirements? If yes, describe.	N/A	N/A	N/A

Additional questions:

1. How does the proposed program align with peer programs? Briefly summarize the similarities between the proposed program and peers, which could include curriculum, overall themes, faculty expertise, intended audience, etc.

There are very few programs in higher education for Signals Intelligence (SIGINT) and/or Electronic Warfare. American Military University typically offers programs that provide pathways to military and government careers. However, they do not currently offer this specialized certificate at the undergraduate level. Georgia Tech offers their program in partnership with the Georgia Tech Research Institute (GTRI), which is a university affiliated, nonprofit, applied research center of Georgia Tech that has various research labs across the country. Much of the GTRI research focuses on cybersecurity, defense technology, and military/government operations.

2. How does the proposed program stand out or differ from peer programs? Briefly summarize the differences between the proposed program and peers, which could include curriculum, overall themes, faculty expertise, intended audience, etc.

Our program will utilize CAST's unique and state-of-the-art Cyber Virtual Learning Environment (VLE). The academic and research content of the VLE is built around Cyberapolis, a virtual world where students learn and practice both their skills. The

VLE is an unstructured, synthetic, live environment designed to replicate the real internet; providing a realistic, non-scripted platform that forces students to synthesize and apply what they learn. The VLE will also aid in training simulations for this particular contract with the Army.

3. How do these differences make this program more applicable to the target student population and/or a better fit for the University of Arizona?

The undergraduate certificate is part of an established agreement with the Army for us to provide training and programs. Given the unique and important nature of the program, it will be sustainable after the agreement to provide training and preparation for this field.

UNCLASSIFIED



DEPARTMENT OF THE ARMY  
OFFICE OF THE DEPUTY CHIEF OF STAFF, G-2  
1000 ARMY PENTAGON  
WASHINGTON, DC 20310-1000

September 12, 2024

SUBJECT: Project CAVEMAN

Mr. Jason Denno  
Executive Director  
Cyber Convergence Center (C3)  
College of Applied Science & Technology (CAST)  
The University of Arizona (UA)  
520-227-7203  
jasondenno@arizona.edu

Dear Mr. Denno,

As the Director of the Headquarters, Department of the Army (HQDA) Deputy Chief of Staff, Intelligence's (G2's) ISR Task Force, I am writing to acknowledge receipt and review of the CAVEMAN report submitted by UA. The work being done under the current contracted CAVEMAN effort has significant potential to transform the way we train our Soldiers. This letter serves as a non-binding notification of our commitment to Project CAVEMAN while we work through the programmatic details at the HQDA level.

I acknowledge your desire to start no-cost preliminary preparations for Soldiers to attend a program launch in Fall 2025 as both trainees and students. This includes, but is not limited to, beginning the curriculum development process, articulating new UA programs with the U.S. Army 35S MOS, Signals Collection Analyst, Program of Instruction (POI), and integration of training modules within CyberApolis.

The point of contact for Project CAVEMAN and this letter is my SETA Contractor, Alexander Aplan at: [alexander.j.aplan.ctr@army.mil](mailto:alexander.j.aplan.ctr@army.mil) or 703-695-1316.

Sincerely,

A handwritten signature in black ink, appearing to read "Andrew S. Evans", with a long horizontal flourish extending to the right.

Andrew S. Evans  
Director, Intelligence, Surveillance,  
and Reconnaissance Task Force

UNCLASSIFIED