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Cerro Coso Community College

Cyber Security Technology

Bachelor of Science
Proposal

May 11, 2023





Contributors

Faculty

Project Lead:

Valerie Karnes Professor of Information Technology

Paul Kuttig, Professor of Information Technology

Steven Alexander, Adjunct Professor of Information Technology

John Bradley, Adjunct Professor of Information Technology

Chris Harper, Adjunct Professor of Information Technology

Dawn Ward, Professor of Paralegal Studies

Debilyn Kinzler, Professor of English

Professional Experts

Autumn Karnes, Branch Head, NAWCWD

Administration

Dr. Corey Marvin

Vice President of Instruction

Nicole Griffin

Dean of Career Technical Education

Jaclyn Kessler

Director of Institutional Research

KCCD Advisors

Liz Rozell

Todd Coston



Overview

- Program Need
- Labor Market Analysis
- Employer Demand
- Student Interest
- Program Details
- Budget and Funding Plan



Program Need

- Cerro Coso location
 - Serves 5 counties across 18,000 square miles
- Closest CSU campus
 - 117 miles to CSU Bakersfield
 - 116 miles to CSU San Bernardino





Program Need

- Unique location in defense and aerospace corridor
- Top employers include:
 - Naval Air Weapons Station, China Lake
 - Edwards Air Force Base
 - Mojave Air and Space Port
 - Lockheed Martin
 - Northrop Grumman
 - Many private contractors

Labor Market Analysis

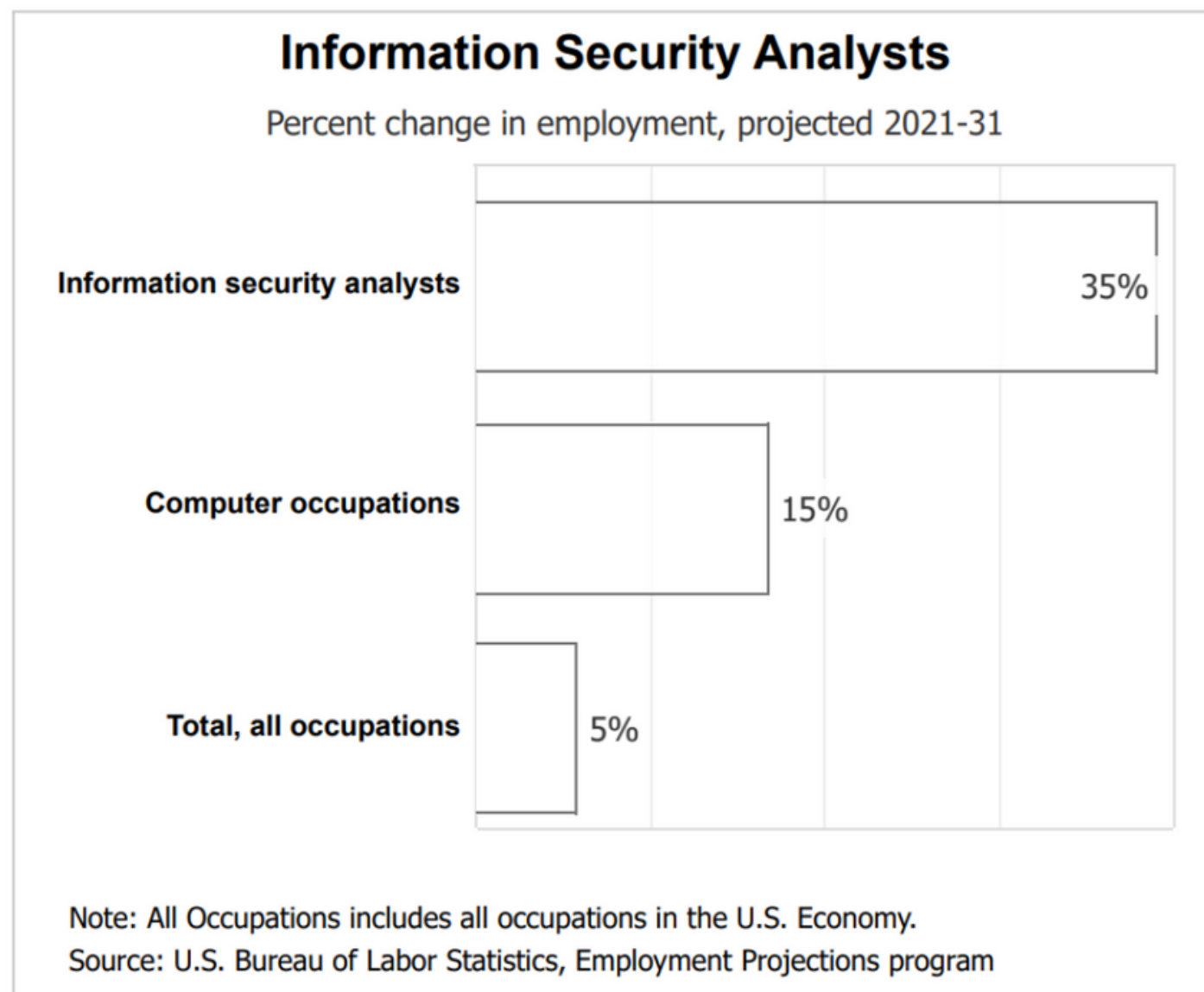


Cyber Security Occupations Include:

- Network and Computer Systems Administrators
- Computer Network Support Specialists
- Computer User Support Specialists
- Information Security Analysts
- Computer Systems Analysts
- Software Quality Assurance Analysts and Testers



Labor Market Analysis



- U.S. Bureau of Labor Statistics projects that **Information Security** jobs will grow faster than other occupations between 2021-2031 at about 35%
- 8th fastest growing occupation
- A bachelor's degree is becoming increasingly required for these occupations

Labor Market Analysis



- Wages are significantly higher than other professions with a median wage of \$102,600 per year, or \$49.33 per hour
- Center of Excellence data shows that Information Security Analysts in the Central Valley/Mother Lode region earn the highest entry-level wage, \$38.92/hour, of cyber security related occupations in the subregion.



Labor Market Analysis

Regional Wage for Cyber Security Occupations:

Exhibit 2a. Cyber Security hourly wages in the SCV/SML subregion

Occupation	Pct. 25 Hourly Earnings	Median Hourly Earnings	Pct. 75 Hourly Earnings
Middle-Skill Occupations			
Network and Computer Systems Administrators	\$31.66	\$40.93	\$47.89
Computer Network Support Specialists	\$24.70	\$29.72	\$36.91
Computer User Support Specialists	\$20.45	\$27.03	\$34.45
Above Middle-Skill Occupations			
Information Security Analysts	\$38.92	\$51.50	\$66.53
Computer Systems Analysts	\$33.24	\$42.10	\$54.32
Software Quality Assurance Analysts and Testers	\$32.65	\$40.74	\$55.30

¹ The term “living wage” in Center of Excellence reports is calculated by averaging the self-sufficiency wages from the Insight Center’s California Family Needs Calculator for each county in the subregion: <https://insightccd.org/tools-metrics/self-sufficiency-standard-tool-for-california/>.

² Entry-level wages are derived from the 25th percentile.



Labor Market Analysis

Regional employment projections:

Exhibit 1. Cyber Security employment and occupational projections in the SCV/SML subregion

Occupation	2021 Jobs	2026 Jobs	5-Year Change	5-Year % Change	Annual Openings
Middle-Skill Occupations					
Computer User Support Specialists	1,908	2,129	221	12%	200
Network and Computer Systems Administrators	999	1,081	83	8%	86
Computer Network Support Specialists	627	683	56	9%	61
SUBTOTAL	3,534	3,893	359	10%	347
Above Middle-Skill Occupation					
Computer Systems Analysts	1,130	1,272	142	13%	112
Software Quality Assurance Analysts and Testers	310	359	49	16%	34
Information Security Analysts	256	313	57	22%	32
SUBTOTAL	1,696	1,944	248	15%	178
TOTAL	5,229	5,836	607	12%	525



Labor Market Analysis

Education levels requested per job posting:

Exhibit 5. Education levels requested in job postings for *Cyber Security Occupations*

Education Level	Job Postings	% of Job Postings
Bachelor's degree	627	39%
High school or GED	289	18%
Associate degree	230	14%
Master's degree	110	7%
Ph.D. or professional degree	34	2%



Employer Demand

- Employers on CC's IT/Cyber Security Advisory Committee overwhelming support the proposed baccalaureate
- Employers in the Indian Wells Valley struggle to fill cyber security positions
- There are not enough trained professionals creating an extremely competitive environment

A magnifying glass is held over a document titled 'Job Opportunity'. The document is slightly out of focus, but the text is legible. The title 'Job Opportunity' is in a large, bold, black font. Below it, the word 'EMPLOYMENT' is written in a smaller, bold, black font. To the left of the title, there is a small box containing the text 'ION AT: 1205'. Below the title, there is a list of job categories with corresponding numbers: 'Accounting.....107', 'Administrative/Clerical.....110', 'Automotive.....129', 'Inventory.....', 'Legal Administrative.....', and 'Legal Employment.....'.

Job Opportunity

Employer Demand

- Mass movement to "the cloud" for organizational documents requires professionals with cyber skills to insure the privacy of data
- The need to protect data is crucial across multiple industries
- Having a bachelor-level degree could increase pay rates for many occupations in the region



Employer Demand

— “ —

NDTI is a pioneer in the cyber security environment, supporting multiple Department of Defense (DoD) contracts, and is in constant need of entry level and experienced cyber security professionals to support NAWCWD, China Lake, as well as our other locations around the country. We look forward to working with CCCC to hire, train, and give graduating cyber security engineers from CCCC a challenging opportunity to be part of our mission supporting the US warfighter.

*Executive Vice President & Chief Operating Officer
New Directions Technologies, Inc (NDTI)*



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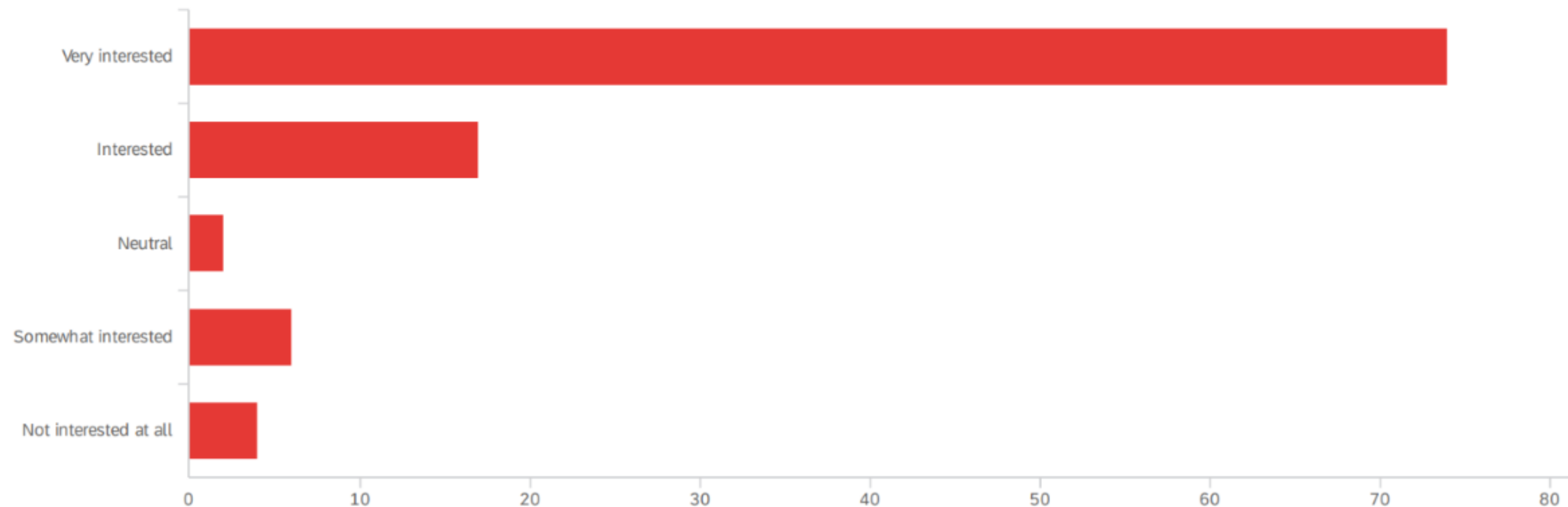
Student Interest

- Surveyed 920 current and former students within the IT/Cyber programs
- Received 106 responses
 - 63% current students
 - 37% former students
- 88% indicated they were either “very interested” or “interested” in enrolling in baccalaureate program
- Reasons included reduced financial costs and not having to relocate

Student Interest

Q7 - How interested would you be in enrolling if Cerro Coso offered a Bachelors of

Science degree in Cybersecurity?



Program Details



- Formed on the basis of industry-standard guidelines and certifications, which include:
 - National Institute of Science and Technology (NIST) framework
 - Computerized Maintenance Management System (CMMS)
 - Risk Management Framework (RMF)
 - Workforce Framework for Cybersecurity (NICE)
- Common framework utilized across the Department of Defense (DoD)

Program Details

- Students would need to complete the Associate of Science degree in Cyber Security Technology, or equivalent, prior to admission to the bachelor's
- Baccalaureate consists of 49 units: 30 units upper-division in major; 10 units upper-division GE; 9 units additional lower-division courses



Program Details



Required courses:

Program specific, upper-division (30 units)

- IT C320: System Logs and Event Management (3 units)
- IT C330: Network Security (3 units)
- IT C350: Windows Forensics (3 units)
- IT C400: Cyber Incident Response (3 units)
- IT C420: Operational Security Architecture – Security class (3 units)
- IT C430: Threat Intelligence (3 units)
- IT C450: Systems and Network Auditing (3 units)
- IT C460: Enterprise Security Architecture (3 units)
- IT C470: Penetration Testing (3 units)
- IT C480 Cloud Security (3 units)

Program Details



Required courses:

General Education, upper-division (10 units)

- PARA C300: Ethics & Cyber Law (3 units)
- ENGL 301: Technical Writing for Professionals (4 units)
- PSYC C300: Industrial and Organizational Psychology (3 units)

Additional lower-division required courses (9 units)

- IT C280: Introduction to Cloud Computing (3 units)
- IT C290: Linux Administration I (3 units)
- IT C292: Linux Administration II (3 units)

*Students may double count upper division/GE courses within their major



Budget & Funding

- Housed within Business and Information Technology department
- Cyber Security Technology associate and bachelor programs would be funded through combination of categorical and general funds
- Minimized overall direct costs of implementation through shared existing resources

Budget & Funding

Sample Student Cost



Student Cost for Completion	Associate Degree (71 units/4 semesters)	Bachelor Degree (40 units upper+ 9 units lower division/4 semesters)	Entire Program Completion (120 units/8 semesters)
<i>California Resident</i>			
Enrollment Fees @\$46/unit	\$ 3,266	\$ 2,254	\$ 5,520
Upper Division Fees @\$84/unit	*	\$ 3,360	\$ 3,360
Student Representation Fees @\$2/term	\$ 8	\$ 8	\$ 16
Textbooks and supplies	\$ 3,600	\$ 2,300	\$ 5,900
Total Estimated Student Cost:	\$ 6,874	\$ 7,922	\$ 14,796
<i>Out-of-State Resident</i>			
Enrollment Fees @\$388/unit	\$ 27,548	\$ 19,012	\$ 46,560
Upper Division Fees @\$84/unit	*	\$ 3,360	\$ 3,360
Student Representation Fees @\$2/term	\$ 8	\$ 8	\$ 16
Textbooks and supplies	\$ 3,600	\$ 2,300	\$ 5,900
Total Estimated Student Cost:	\$ 31,156	\$ 24,680	\$ 55,836



Budget & Funding

Enrollment Projections

Enrollment Projections

Assumes 80% retention per year at associate level, 90% retention per year at baccalaureate level

Bolded cells = Baccalaureate portion of program

Highlighted cells = estimated number of final completers

	Cohort 1	Cohort 2	Cohort 3	Cohort 4	Cohort 5	Cohort 6	Cohort 7*	Cohort 8	Cohort 9	Cohort 10	Cohort 11	
2022-23	20											
2023-24	16	22										
2024-25	20	18	24									
2025-26	18	22	19	26								
2026-27		20	24	21	28							
2027-28			22	26	22	30						
2028-29				23	28	24	40					
2029-30					25	30	32	45				
2030-31						27	40	36	50			
2031-32							36	45	40	55		
2032-33								41	50	44	60	
2033-34									45	55	48	
2034-35										50	60	
2035-36											54	
Est. associate completers	13	14	15	17	18	19	26	29	32	35	38	256
Est. baccalaureate completers	16	18	20	21	23	24	32	37	41	45	49	326

* Starting with Cohort 7, a second cohort is added



Budget & Funding

College Cost Estimates

<u>Cost Estimates</u>	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
<i>Associate Degree (current estimated expenses)</i>						
1000s Academic Salaries (1 full-time @ 1.000; part-time/overload @ 0.667)	\$ 85,168	\$ 108,897	\$ 111,080	\$ 113,317	\$ 115,610	\$ 117,490
3000s Employee Benefits	\$ 37,984	\$ 43,228	\$43,704	\$44,193	\$44,694	\$45,188
4000s Supplies & Materials	\$ 7,500	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000
5000s Services/Operating Expenses	\$ 14,500	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000
6000s Equipment	\$ 500	\$ 500	\$ 500	\$ 10,000	\$ 500	\$ 500
Total Estimated Cost for Associate	\$ 145,652	\$ 161,625	\$ 164,284	\$ 176,510	\$ 169,804	\$ 172,178
<i>Bachelor's Degree (estimated additional expenses)</i>						
1000s Academic Salaries (1 additional full-time; additional part-time/overload @ 1.333)	*	*	\$ 92,488	\$ 130,497	\$ 132,680	\$ 134,917
3000s Employee Benefits	*	*	\$ 39,604	\$ 48,006	\$48,482	\$48,971
4000s Supplies & Materials	*	*	\$ 3,000	\$ 3,000	\$ 3,000	\$ 3,000
5000s Services/Operating Expenses	*	*	\$ 6,000	\$ 6,000	\$ 6,000	\$ 6,000
6000s Equipment	*	*	\$ 500	\$ 500	\$ 500	\$ 500
Total Estimated Cost for Bachelor	\$ -	\$ -	\$ 141,592	\$ 188,003	\$ 190,662	\$ 193,388
Estimated Net Cost for Full Program (Associate+Bachelor)	\$ 145,652	\$ 161,625	\$ 305,876	\$ 364,513	\$ 360,466	\$ 365,566



Budget & Funding

College Revenue Estimates

<u>Revenue Estimates</u>	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
<i>Associate Enrollment**</i>	20	38	42	46	50	54
Base Credit* (\$4,840 per FTES)	*	\$ 86,290	\$ 155,986	\$ 172,249	\$ 188,511	\$ 204,773
Supplemental Allocation* (\$1,145/student eligible)	*	\$ 13,740	\$ 26,106	\$ 28,854	\$ 31,602	\$ 34,350
CTE +9.0 units* (\$645 per student)	*	\$ 12,900	\$ 24,510	\$ 27,090	\$ 29,670	\$ 32,250
Associate Degree* (\$1,935 per completer)	*	*	\$ 24,768	\$ 27,864	\$ 29,412	\$ 32,508
<i>Bachelor Enrollment**</i>	*	*	20	40	44	48
Additional \$84/unit	*	*	\$ 31,920	\$ 66,864	\$ 73,584	\$ 80,304
Base Credit* (\$4,840 per FTES)	*	*	*	\$ 122,798	\$ 233,648	\$ 256,880
Supplemental Allocation* (\$1,145 per student eligible)	*	*	*	\$ 13,740	\$ 27,480	\$ 30,228
CTE +9.0 units* (\$645 per student)	*	*	*	\$ 12,900	\$ 25,800	\$ 28,380
Baccalaureate Degree* (\$1,935 per completer)	*	*	*	*	\$ 31,347	\$ 34,830
<i>Additional Funding</i>						
Categorical Funding (Strong Workforce, Perkins, Other)	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000	\$ 40,000
Estimated Revenue/Funding Potential	\$ 40,000	\$ 152,930	\$ 303,290	\$ 512,358	\$ 711,054	\$ 774,503
Estimated Net Revenue (Revenue minus Costs) for Full Program (Associate+Bachelor)	\$ (105,652)	\$ (8,695)	\$ (2,586)	\$ 147,845	\$ 350,588	\$ 408,937

* SCFF allocations applied in the subsequent year; dollar amounts based on 2022-23 Advance Rates; supplemental allocation assumes 60% of students eligible per college average

** Enrollment projections assume 80% retention per year at associate-level, 90% retention per year at baccalaureate level



In Conclusion

- Cyber security professionals are in **critical demand**
- Cerro Coso is located in a unique area surrounded by defense and aerospace industries with a need to fulfill a **skilled workforce**
- Students would be able to **access** an **affordable** higher education option and enter an in-demand and high paying occupation