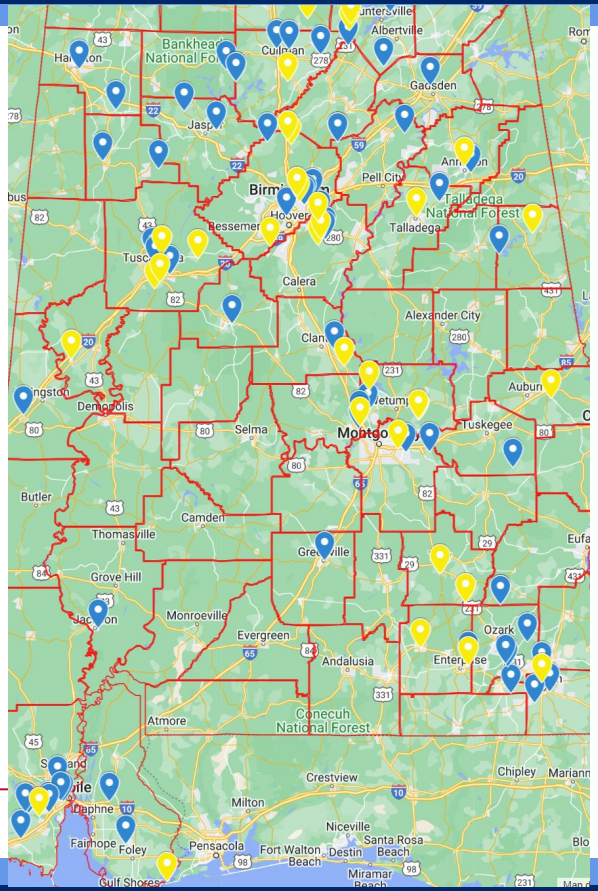
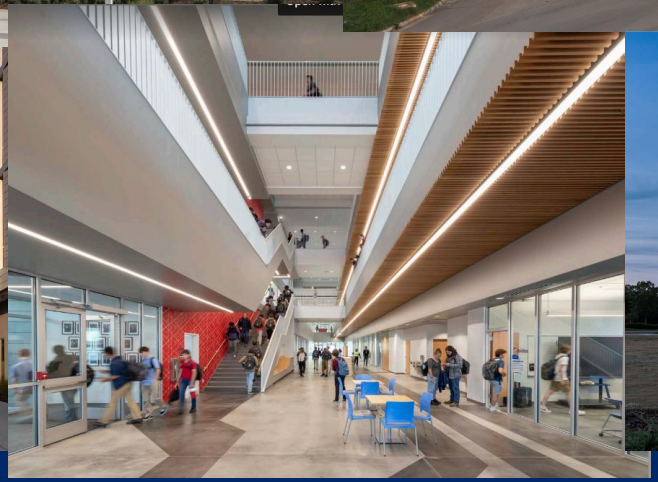
Alabama School of Cyber Technology & Engineering

Advancing Cyber and Engineering Education to Bridge the Workforce Gap

About ASCTE

- Public, state-wide magnet school
- Serves students throughout Alabama
- Free tuition & housing
- Enrollment is application based
- Average class size 15-25
- Earn certifications while attending ASCTE
- Internships and co-op opportunities
- Instruction from subject matter experts
- Instruction focus based on embedding cyber protections into the engineering life cycle.





Why Create ASCTE?

To **create a growing pipeline** of high school graduates capable of advanced placement in postsecondary education and a highly technical workforce pool that is prepared in theory and practice for immediate employment in industry or government.

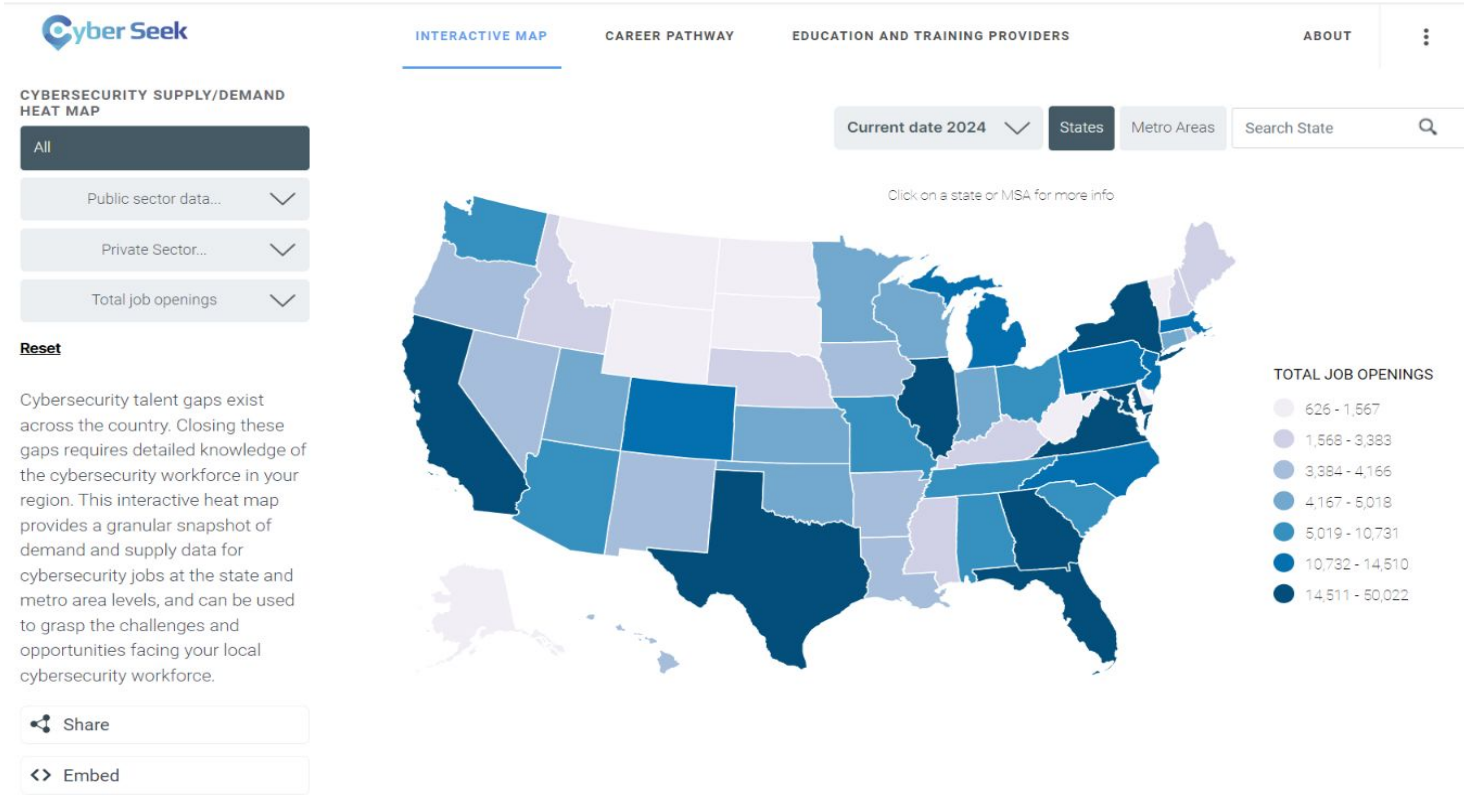
"ASCTE is the only high school in the country teaching students how to integrate cyber into the engineering field. We are continuing to invest in the school."

Governor, Kay Ivey
April 14, 2022

6,000+ Alabama cyber job openings

504,316 U.S. cyber job openings

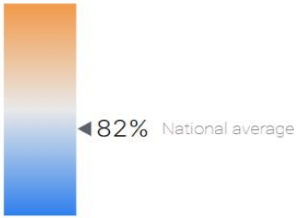
3.5 mil Global cyber job openings


CyberSeek
INTERACTIVE MAP
CAREER PATHWAY
EDUCATION AND TRAINING PROVIDERS
ABOUT
CYBERSECURITY SUPPLY/DEMAND HEAT MAP
All
Public sector data...
Private Sector...
Total job openings
Reset
Cybersecurity talent gaps exist across the country. Closing these gaps requires detailed knowledge of the cybersecurity workforce in your region. This interactive heat map provides a granular snapshot of demand and supply data for cybersecurity jobs at the state and metro area levels, and can be used to grasp the challenges and opportunities facing your local cybersecurity workforce.
Share
Embed
Current date 2024
States
Metro Areas
Search State
Click on a state or MSA for more info
TOTAL JOB OPENINGS
626 - 1,567
1,568 - 3,383
3,384 - 4,166
4,167 - 5,018
5,019 - 10,731
10,732 - 14,510
14,511 - 50,022

National Level

SUPPLY/DEMAND RATIO

NATIONAL, 2024



TOTAL CYBERSECURITY JOB OPENINGS

NATIONAL, 2024

448,033

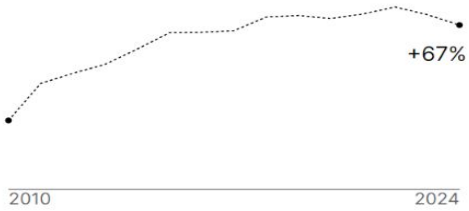
TOTAL EMPLOYED CYBERSECURITY WORKFORCE

NATIONAL, 2024

1,098,481

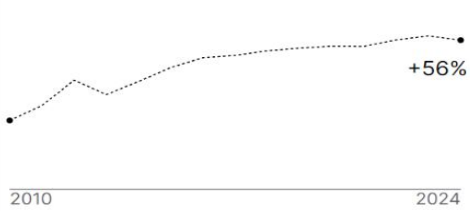
HISTORICAL CYBERSECURITY JOB OPENINGS

NATIONAL AVG



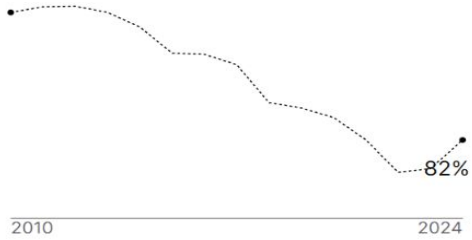
HISTORICAL EMPLOYED CYBERSECURITY WORKFORCE

NATIONAL AVG



HISTORICAL SUPPLY/DEMAND FOR CYBERSECURITY [BETA]

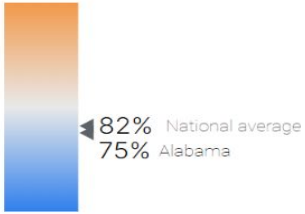
NATIONAL AVG



Alabama

SUPPLY/DEMAND RATIO

ALABAMA, 2024



TOTAL CYBERSECURITY JOB OPENINGS

ALABAMA, 2024

8,643

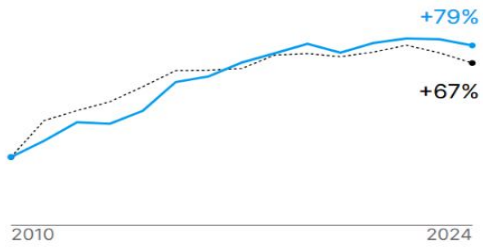
TOTAL EMPLOYED CYBERSECURITY WORKFORCE

ALABAMA, 2024

15,682

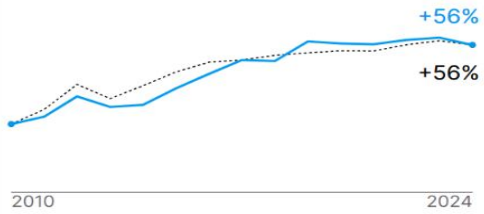
HISTORICAL CYBERSECURITY JOB OPENINGS

NATIONAL AVG
ALABAMA



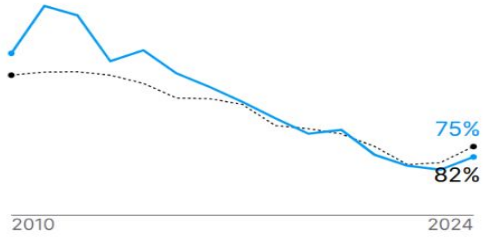
HISTORICAL EMPLOYED CYBERSECURITY WORKFORCE

NATIONAL AVG
ALABAMA



HISTORICAL SUPPLY/DEMAND FOR CYBERSECURITY [BETA]

NATIONAL AVG
ALABAMA



Our Mission

To ensure that **all students** achieve high levels of learning to be successful in implementing cyber protections into the engineering lifecycle.

Our Vision

ASCTE envisions **a team with common goals and mutual accountability** for student achievement that will become a national model in collaboration with governmental agencies, industry, and higher education specializing in cyber & engineering.

ASCTE FOUNDATION

MISSION

Foster and facilitate a healthy ecosystem between federal/ state/ local/ academia/ industry for the longevity/sustainability of the Alabama School of Cyber Technology & Engineering (ASCTE) to empower the next generation's cyber, technology, and engineering workforce.

VISION

Be a well-structured, trusted non-profit organization that raises awareness, advocacy and funds to create equitable opportunities for education that enable the cyber technology and engineering workforce.

ASCTE Board of Trustees

Appointed by Legislation		Appointed by Governor	
Alabama Senate	ASCTE Foundation	Congressional District 1	Congressional District 2
University of Alabama President	Tuskegee University President	Congressional District 3	Congressional District 4
U of Alabama Huntsville Pres	Alabama A&M Univ President:	Congressional District 5	Congressional District 6
Community College Chancellor	University of South Alabama	Congressional District 7	Madison County
Auburn University President	Alabama House		
Alabama Dept of Education			

Stakeholders

City, State, & Federal Agencies

- City of Huntsville donated 26 acres in Cummings Research Park ($1.8M)
- Governor Kay Ivey signed legislation creating independent boarding school.
- FY23 budget appropriation approximately $10M
- Endorsed by Senator Shelby: “Alabama is the cyber hub and Huntsville is the cyber city.”
- Partnership with NSA, FBI, US ARMY Support through SMDC, DEVCOM, AvMC, S3I, US ARMY Cyber Command

Academia

- Six university presidents serve on Board of Trustees plus additional partners:
  University of Alabama, Auburn University, University of Alabama Huntsville, Alabama A&M, Tuskegee University, University of South Alabama, Drake State, Calhoun CC, MIT, Mississippi State University.

Industry

- Partner with industry sectors including Heath, IT, Cyber, Finance, Engineering, & Utilities.

Non-Profits

- HEALS, AMIIC, Housing Authorities, Boys and Girls Clubs, Scouts, Girls Inc, AIDB

Snapshot of Growth

Aug 2020
Year 1
72 Students
32 Residential
Oakwood Univ

Aug 2021
Year 2
150 Students
60 Residential

Aug 2022
Year 3
256 Students
112 Residents
229 Wynn

Aug 2023
Year 4
330 Students
120 Residents

Aug 2024
Year 5
360 Students
135 Residents

Aug 2025
Year 6
360 Students
135 Residents

Aug 2020
229 Wynn
Ground
Breaking

Aug 2022
Opening of
Permanent Site

Jan 2024
Ground Breaking
Sentinel Center

2023-24 School Demographics
34% Female 35% Minority 23% Black

2023-24 Soph-Seniors
24% Female 35% Minority 22% Black

2023-24 Freshmen
41% Female 41% Minority 25% Black

ASCTE FOUNDATION

Partners In Education

TITAN
Raytheon

PATRIOT
Redstone FCU

GUARDIAN
SAIC

LEGACY
City Land Donation
Leidos
Northrop Grumman

GATEKEEPER
Colsa
Radiance
Alabama Power

DEFENDER
Aetos
CACI
Davidson
Deloitte
Intuitive
Lockheed Martin
META
Monte Sano Research
Sentar
Torch Technologies
Trideum

PROTECTOR
APT Research
AT&T
Blue Cross Blue Shield
DESE
Huntsville Utilities
PPG
Regions
TCU
Yulista

GROUNDBREAKER
Adtran
Aerojet Rocketdyne
Chugach
Cyber Huntsville
DCS Corp
The Sullivan Family
Inspire & Achieve

MOUS
Bullock County Schools
Calhoun College
DevCom
Drake State College
NSA
Succeed (UAH & SMDC)

Goal: $36,000,000

Currently Raised: >$16M

Benefits for Partners

Pipeline

Direct access to ASCTE students as future workforce

Recognition

National recognition supporting the development of innovative educational program.

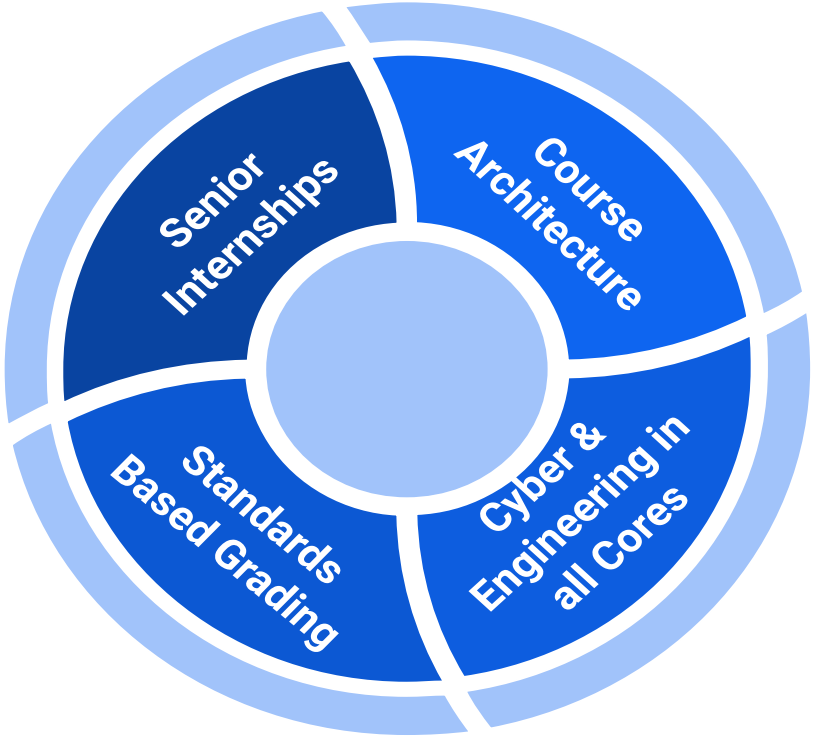
Outreach

Community outreach including traditionally underserved and underrepresented communities in Alabama.

Development

Positions partners well with clients in the community

The Sentinel Experience



All Students Participate in a Club/Sport/Activity

AHSAA Sports

- Volleyball
- Cross Country
- Swim
- Basketball
- Bowling
- Tennis
- Track & Field
- Soccer

Clubs

- Archery
- Drama
- Scholars Bowl
- Drone Racing
- E-Sports
- CyberPatriot
- Radio
- News Crew
- Walking
- Sentinel Service
- Stress Management
- Ambassadors
- Band
- Beta
- National Honor Society
- SGA
- Board Games
- Literary Club
- Shop Club
- Robotics

Activities

- Halloween Party
- Winter Formal
- Hiking
- Board Gaming
- Community Outreach
- Six Flags Trip
- Spring Dance
- Residential Life Activities
- Senior Trip
- Trash Pandas

Course Architecture

Electives — Diverse electives giving students choice

Internship — Three & four year plan ensures senior internship opportunity

Grading — Standard based grading ensures students demonstrates essential skills/knowledge.

Embedded Cyber/Eng — Courses linked to national/industry standards while embedding cyber & engineering

Learning-Based Grading

Grade	Grade Points	Grading Descriptions
Mastery **M**	**4.5**	• Student successfully performs identified skill without assistance. • Student demonstrates a firm understanding of the topic, and at times; exceeds proficiency. • Student demonstrates knowledge while working in collaboration or assisting peers. • Student has **complete proficiency** in the learning target/skill.
Proficient **P**	**3.5**	• Student requires minimal guidance to perform this skill successfully. • Student meets the expectation of understanding the target and can coherently discuss almost all of the terminology and concepts. • Student **meets the expectations of basic proficiency** in the learning target/skill but could still use more development in applying and enhancing the knowledge or skill.
Emerging **E**	**2.5**	• Student requires some guidance to perform this skill successfully. • Student demonstrates limited understanding of the target and can moderately discuss some of the terminology and concepts. • Student **demonstrates limited understanding and needs additional development to obtain proficiency** in this learning target/skill
Beginning **B**	**1.0**	• Student requires steady assistance to perform this skill successfully. • Student demonstrates a limited understanding of the target and labors discussing the terminology and concepts. • Student does **not demonstrate proficiency** in this learning target/skill.
Insufficient Evidence **I**	**0**	• Very rare case. • Extreme work completion issues. • **Not enough assessment evidence** to indicate this student's proficiency.

Work Ethic Grading

Work Ethic Rubric

Work ethic scores represent student actions and inactions demonstrated in the learning process.

Score	Explanation
3	The student **consistently** • completes and submits work on time • demonstrates determination in overcoming obstacles • uses communication tools in a timely and consistent manner • demonstrates leadership abilities and successfully works independently and with peers
2	The student **mostly** • completes and submits work on time • demonstrates determination in overcoming obstacles • uses communication tools in a timely and consistent manner • demonstrates leadership abilities and successfully works independently and with peers
1	The student **occasionally** • completes and submits work on time • demonstrates determination in overcoming obstacles • uses communication tools in a timely and consistent manner • demonstrates leadership abilities and successfully works independently and with peers

The following are general examples as to how a teacher may assign a score. Teacher discretion will be applied and teachers will communicate specific expectations to their students.

Examples of how to score a 3	Examples of how to score a 2	Examples of how to score a 1
- Student leads the engagement in the classroom - Student is rarely driven to distraction by electronics (phone/AirPods/computer games, etc.) - Assignments are consistently submitted on time	- Students is engaged in the classroom - Student is occasionally driven to distraction by electronics (phone/AirPods/computer games, etc.) - Assignments are mostly submitted on time	- Student is rarely engaged in the classroom and has to frequently be redirected - Student is repeatedly driven to distraction by electronics (phone/AirPods/computer games, etc.) - Assignments are rarely submitted on time

Attitude Grading

Attitude Rubric

Attitude scores represent student demeanor demonstrated in the learning process.

Score	Explanation
3	The student **consistently** • Respectfully communicates thoughts, ideas, and actions • Supports diversity through applying awareness of cultural differences to support positive interactions with others • Upholds an attitude of willingness in all aspects of the classroom
2	The student **mostly** • Respectfully communicates thoughts, ideas, and actions • Supports diversity through applying awareness of cultural differences to support positive interactions with others • Upholds an attitude of willingness in all aspects of the classroom
1	The student **occasionally** • Respectfully communicates thoughts, ideas, and actions • Supports diversity through applying awareness of cultural differences to support positive interactions with others • Upholds an attitude of willingness in all aspects of the classroom

The following are general examples as to how a teacher may assign a score. Teacher discretion will be applied and teachers will communicate specific expectations to their students.

Examples of how to score a 3	Examples of how to score a 2	Examples of how to score a 1
- Student always uses comments and body language that illustrate an attitude of respect and encouragement even with those of differing views - Student rarely disrupts/interrupts classroom instruction - Student rarely whines, complains or uses inappropriate body language	- Student mostly uses comments and body language that illustrate an attitude of respect and consideration even with those of differing views - On occasion, student disrupts/interrupts classroom instruction - Student occasionally whines, complains or uses inappropriate body language	- Student rarely uses comments and body language that illustrate an attitude of respect and consideration especially with those of differing views - Student repeatedly disrupts/interrupts classroom instruction - Student frequently whines, complains or uses inappropriate body language

Freshmen Vs Sophomore

Incoming Freshmen Four Year Plan

		FRESHMAN YEAR			SOPHOMORE YEAR			JUNIOR YEAR			SENIOR YEAR		
		Fall Term Aug - Oct	Winter Term Nov - Feb	Spring Term Mar - May	Fall Term Aug - Oct	Winter Term Nov - Feb	Spring Term Mar - May	Fall Term Aug - Oct	Winter Term Nov - Feb	Spring Term Mar - May	Fall Term Aug - Oct	Winter Term Nov - Feb	Spring Term Mar - May
Core	Math	*MA 101- Mathematics for Engineers	MA 201- Pre-Calculus		MA 301 Advanced Math Trigonometry			MA 401- AP Calculus			Internship 501	Internship 502	Internship 503
	Science	SCI 101- Physics	SCI 201- Chemistry		SCI 301- Biotechnology			SCI 401-AP Physics with Calculus - Mechanics					
	Social Science	SS 101- History of Engineering	SS 201- History of Cryptology		SS 301- Cyber Economics & Government			SS 401- Evolution of Social Engineering					
	Language	LANG 101- Foundations of English	LANG 201- Technical & Analytical Writing		LANG 301- AP Language & Composition			LANG 401- Seminar					
	Cyber	CYB 101- Intro to Cyber & AP CS Principles	CYB 201 - CyberSecurity Foundations		CYB 301 - Offensive Security & Assurance			CYB 401- Special Topics					
	Engineering	ENGR 101- Foundations	ENGR 201- Applications		ENGR 301- Systems			ENGR 401- Special Topics					

Incoming Sophomore Three Year Plan

		SOPHOMORE YEAR			JUNIOR YEAR			SENIOR YEAR		
		Fall Term Aug - Oct	Winter Term Nov - Feb	Spring Term Mar - May	Fall Term Aug - Oct	Winter Term Nov - Feb	Spring Term Mar - May	Fall Term Aug - Oct	Winter Term Nov - Feb	Spring Term Mar - May
Core	Math	MA 101- Mathematics of Data		MA 201- Pre-Calculus		MA 301 Advanced Math Trig		MA 401- AP Calculus		Internship 501
	Science	SCI 101- Physics		SCI 201- Chemistry		SCI 301- Biotechnology		SCI 401-AP Physics with Calculus		
	Social Science	SS 101- History of Engineering		SS 201- History of Cryptology		SS 301- Cyber Econ & Gov		SS 401- Evolution of Social Engineering		
	Language	LANG 201- Technical & Analytical Writing		LANG 301- AP Language & Comp		LANG 401- Seminar		CAPSTONE		
	Cyber	CYB 101- Intro to Cyber & CS		CYB 201		CYB 301		CYB 401- Specialized		
	Engineering	ENGR 101- Foundations		ENGR 201- Applications		ENGR 301- Systems		ENGR 401- Specialized		

Core Courses & Electives

FRESHMAN			SOPHOMORE			JUNIOR			SENIOR		
Fall	Winter	Spring	Fall	Winter	Spring	Fall	Winter	Spring	Fall	Winter	Spring
CYB101			CYB201			CYB301			CYB401		
ENGR101			ENGR201			ENGR301			ENGR401		
MA101			MA201			MA301			MA401		
LANG101			LANG201			LANG301			LANG401		
SS101			SS201			SS301			SS401		
SCI101			SCI201			SCI301			SCI401		

Mon/Tue	Wed/Thr	Mon/Tue	Wed/Thr	Monday - Thursday	
Career Prep: Boseck Crigger	AP Pysics C E&M: Krome	Career Prep: Boseck Crigger	AP Enviromental Science	Graphic Arts 1: Matthews	AP Starts Oct 16
AP Cal BC: Massey	Math for College: Joly	Drivers Education: Wright	Networking: Yancey	Math Foundations: Joly	AP Comp Sci A: Bohon
AP US History: Reese & Watson		Poetry: Taylor	Maker: Pelle/Elliott	Music Technology: Taylor	AP Biology: Watson
Cyber Special Topic: Robbins	Music Theory: Taylor	Graphic Arts 2: Matthews	ACCESS: Crigger	Maker Space Drones: Elliott	AP Physics 1: Crowder
Networking: Yancy	Maker: Elliott/Pelle/Elliott	Recovery/Reinforcement: (WIN)		Career Prep: Boseck	AP Chemistry: Dalton
Graphic Arts 3: Matthews	Strength/Conditioning: Matthews			Drama: Krause	AP Literature: Bryan
BioChem: Carden/Dalton/Crowder	AP Psychology: Blair			Engineering Elective: Staff	AP Statistics
Early College or ACCESS: Crigger	Early College or ACCESS: Crigger				

Course Descriptions: Cyber 101

Cyber 101:Cybersecurity and Computer Science Fundamentals (520101)

Brief Description

There is a national need for engineers that think about cybersecurity from the very beginning of a product's lifecycle. Cyber 101 is an introduction to cybersecurity and computer science principles that begins to address that critical need. Not only will students develop their own program by the end of the class, but they will also consider cybersecurity every step along the way. Upon completing Cyber 101, students will be able to define the purpose and scope of cybersecurity, understand computer fundamentals, and proficiently write basic scripts.

The course doubles as an opportunity for the students to take the AP Computer Science Principles exam. All students will be expected to attempt the exam at the end of their first school year. Cyber 101 dedicates copious time to teaching the fundamentals of programming needed to pass the APCSP exam and excel in their future coursework at ASCTE.

Essential Learning Targets:

- ELT 1: Explain the fundamental principles of cybersecurity.
- ELT 2: Identify the core components of computing devices.
- ELT 3: Represent values of different data types using variables.
- ELT 4: Use conditional statements and boolean logic to alter the flow of a program.
- ELT 5: Create and manipulate data structures including lists, tuples, and dictionaries.
- ELT 6: Perform iteration on data structures.
- ELT 7: Define and call functions.
- ELT 8: Submit a completed Create Task to AP Classroom.

Course Descriptions: Cyber 201

Cyber 201: CyberSecurity Technical Principles (520102)

Brief Description

Cyber 201 will build off foundational technical skills acquired in Cyber 101. This course is a collegiate-level survey of cyber-physical systems designed to provide an overarching understanding of cyber security with respect to engineering life cycles. Throughout the survey process, students will organically be prepared to master the six domains of the CompTIA Security+CE certification. In addition, students will have the exciting opportunity to conduct cryptography, password cracking, enumeration, and social engineering.

Essential Learning Targets:

- ELT 1: Identify the core components of computer hardware and distinguish between the various types of computing devices.
- ELT 2: Install and configure operating systems on physical computers and virtual machines.
- ELT 3: Create and configure a computer network.
- ELT 4: Locate and manipulate files using the Linux terminal.
- ELT 5: Write and successfully execute programs in a Linux environment.
- ELT 6: Use original code and established libraries to encrypt data.
- ELT 7: Create scripts capable of interacting with a computer's operating system.
- ELT 8: Use basic security tools in Linux to assess system vulnerabilities.

Course Descriptions: Cyber 301

Cyber 301: Computer Network Security (520103)

Brief Description

Networking is such an important foundational skill in cybersecurity that it deserves its own class. In Cyber 301, students will be doing a deep dive into networking concepts and network security. By the end of this course, students will be able to configure a secure network and interpret communication between two computers.

Essential Learning Targets:

- ELT 1: Explain data transmission and encapsulation using network communication models.
- ELT 2: Differentiate common network protocols and ports.
- ELT 3: Create and configure a computer network.
- ELT 4: Orient and navigate a computer network.
- ELT 5: Examine strengths and weaknesses of a network and associated protocols.
- ELT 6: Design a secure network architecture by securely configuring network devices.
- ELT 7: Design a secure network architecture using cyber resiliency principles.
- ELT 8: Troubleshoot a failed network connection.

Course Descriptions: Cyber 401

Cyber 402 - Special Topics (520104a)

Brief Description

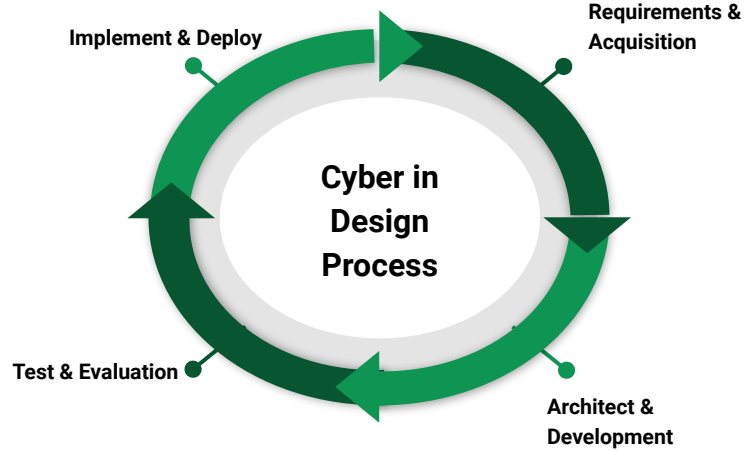
Cyber 402 is the crowning course of the cybersecurity curriculum at ASCTE. In this class, students will be expected to perform the tasks of a cybersecurity analyst. This is an important role at ASCTE because the skills of a cybersecurity analyst enable the implementation of cyber protections throughout the engineering lifecycle. Upon completion of this course, the students will have experience evaluating system vulnerabilities which they can apply in their future academic or industry efforts. This course is only available for students who entered ASCTE as freshmen.

Essential Learning Targets

- ELT 1: Configure a computer network to enable the use of security tools.
- ELT 2: Design a secure network architecture by securely configuring network devices.
- ELT 3: Examine strengths and weaknesses of a wireless network and associated protocols.
- ELT 4: Configure policy according to standards, frameworks, or organizational directives.
- ELT 5: Assess a computer's alignment to security policy.
- ELT 6: Evaluate the security of a system using a vulnerability scanner and report findings.
- ELT 7: Exploit a system using the Metasploit Framework.
- ELT 8: Given a system, perform a risk assessment.
- ELT 9: Apply virtualization technologies to configure a secure network architecture.
- ELT 10: Configure a security information event manager (SIEM) to detect threats.
- ELT 11: Develop and execute an incident response plan.

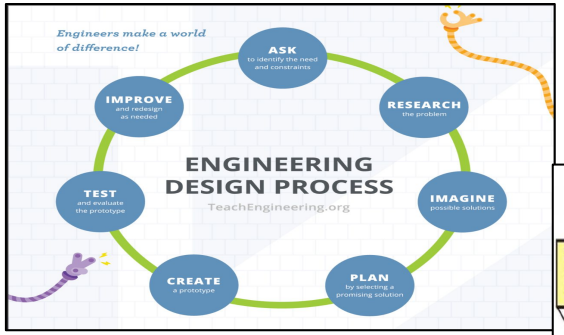
The Integration of Cyber and Engineering

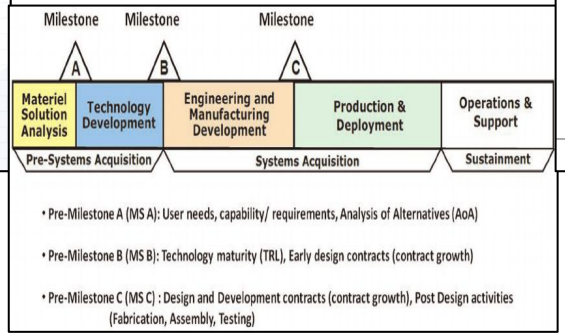
- Going beyond traditional schools of thought:
  - Cyber and Engineering aren't executed in a vacuum
  - Exposure to cyber-physical systems in Space, Critical Infrastructure, and Defense
  - Disciplines are introduced with respect to the design/technology acquisition lifecycle

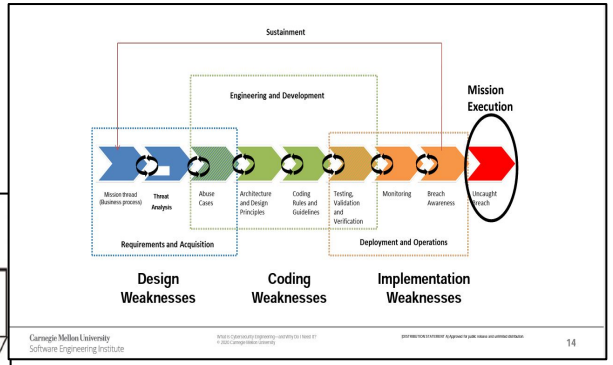


Bridging Models

- Developing technologies and capabilities is an engineering process
- Integrating means shifting security to the ← Left
- Must continually weigh risk against functional requirements

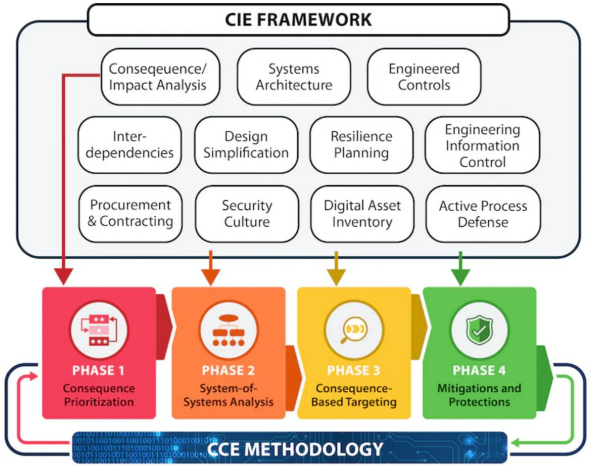






Secure and Resilient Technologies

- Emphasis on “baking in security” and resiliency of design
- Produces well-rounded technical professionals and security practitioners
- Aligns with initiatives and frameworks such as CISA’s “Secure by Design” Campaign and Department of Energy’s “Cyber Informed Engineering” framework



Integration into all Courses

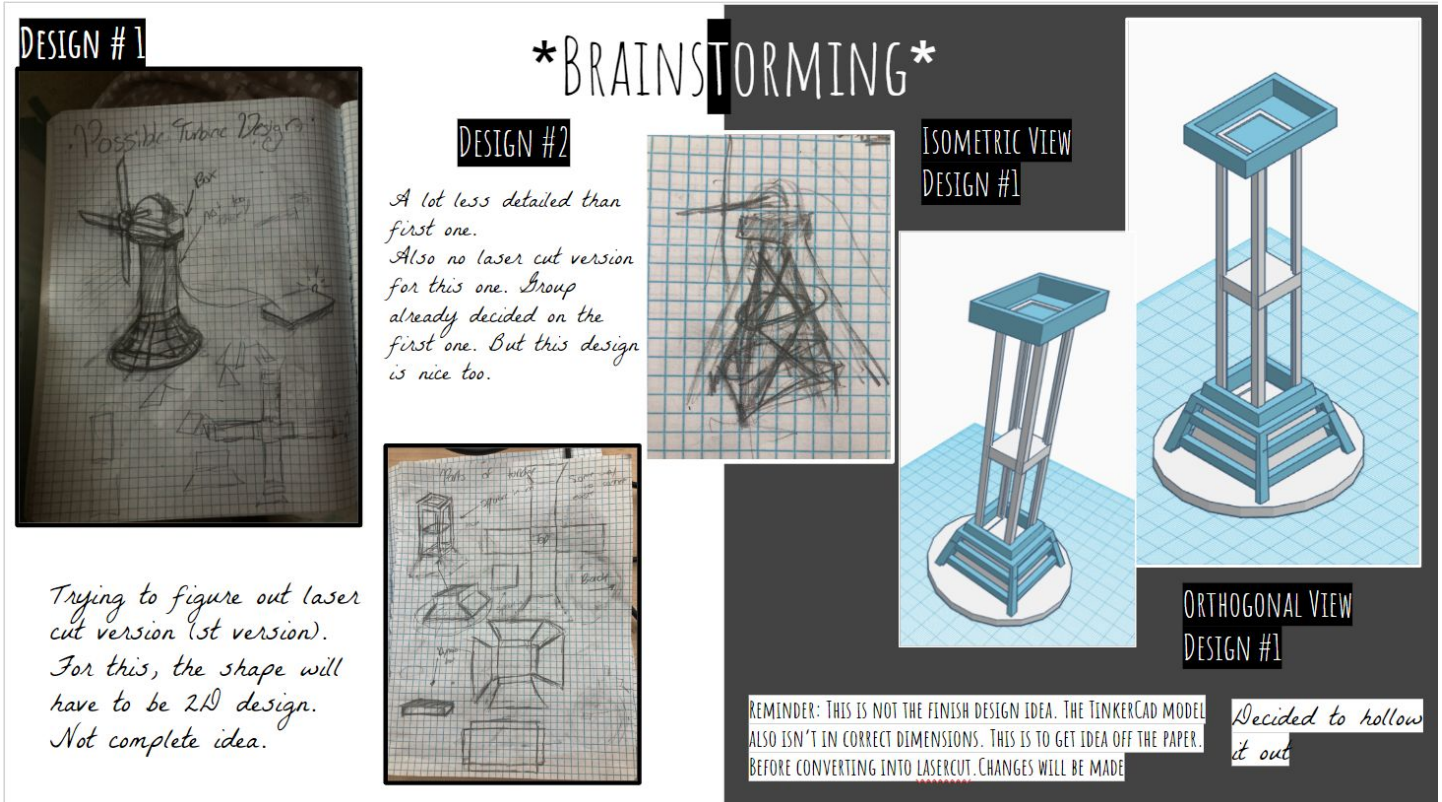
An Integration Project

LANG101 & ENG101

With connections to other 100 level courses

While reading the Boy Who Harnessed the Wind in LANG101, students construct a functional wind turbine in Engineering mirroring the experiences of the book's central character.

Interdisciplinary Collaboration



A Collaborative Project:

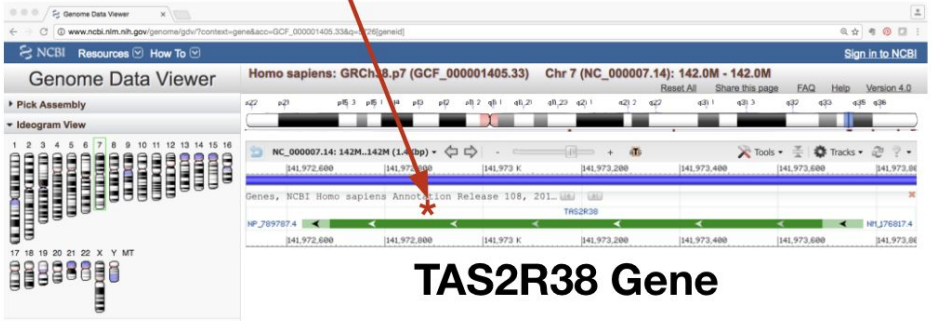
Cyber 301 and Biotechnology 301 students *conducted DNA genotyping for a variant within the TAS2R38 gene in Biotechnology and utilized the data to populate a machine learning model to predict their bitter taste phenotype in the Cyber 301 course*

TAS2R38

The question

A DNA change is identified at position 141972905 on chromosome 7.

Does this DNA change lead to increased sensitivity to the taste of bitter foods like Brussels sprouts?



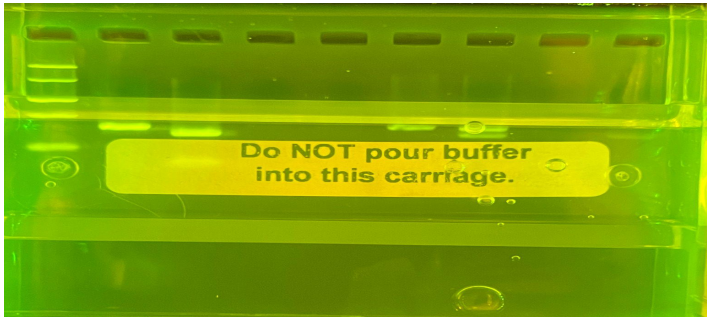
TAS2R38 Gene

ANSWER: NO - it actually leads to a <u>decreased</u> sensitivity to the taste of bitter foods

Testing

Table 1: Three SNPs in the TAS2R38 gene control the ability to taste PTC. AVI is the non-taster (recessive) variant and PAV is the taster (dominant) variant.

Nucleotide Position (bp)	Nucleotide Change		Codon Change		Amino Acid Change	
	Non-taster	Taster	Non-taster	Taster	Non-taster (AVI)	Taster (PAV)
145	G	C	GCA	CCA	Alanine (A)	Proline (P)
785	T	C	GTT	GCT	Valine (V)	Alanine (A)
886	A	G	ATC	GTC	Isoleucine (I)	Valine (V)



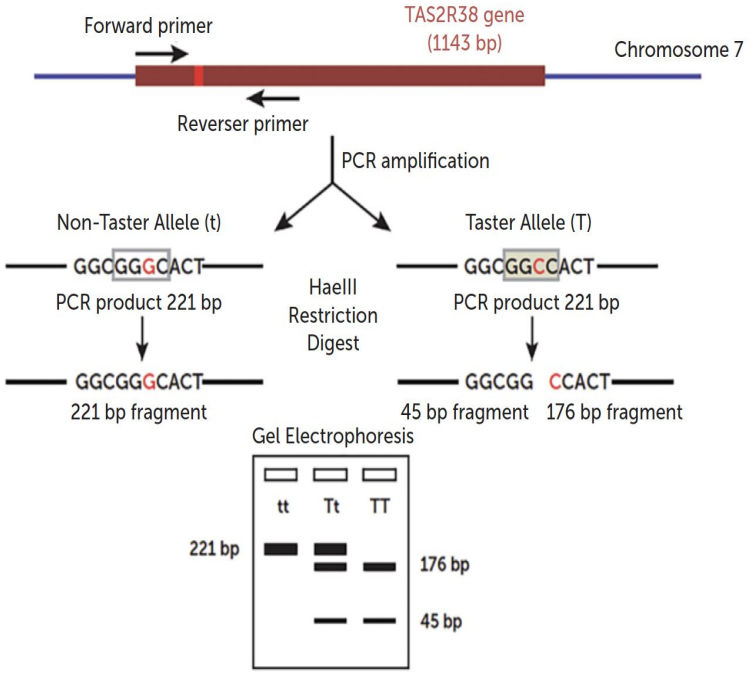


Figure 4. Overview of PTC taster genotyping using PCR, HaeIII restriction analysis, and gel electrophoresis.

Python Pandas Library

The file shows how the prediction is achieved via loading in the data and producing a predictive output.

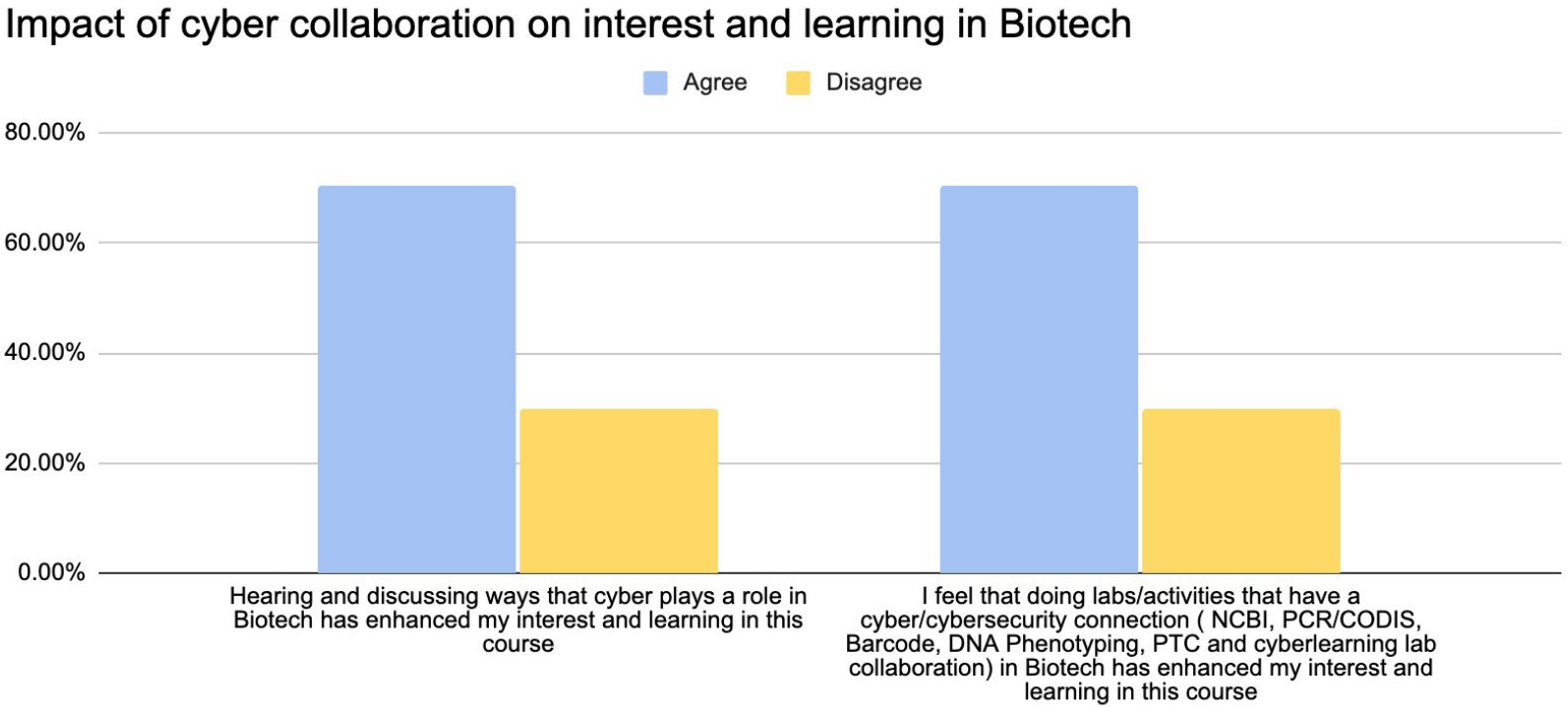
```
import pandas as pd
from sklearn.neighbors import KNeighborsClassifier
from sklearn.model_selection import train_test_split
from sklearn.metrics import accuracy_score
from sklearn.metrics import precision_score
from sklearn.metrics import recall_score

### Objective: Predict the phenotype of a person based on genetic input data
### using a K-Nearest Neighbors classifier.

# Read the dataset from the CSV file
seeds = pd.read_csv('TAS2R38_dataset_normalized.csv')

# Split the dataset into data and labels
data = seeds.iloc[:, 0:7]
labels = seeds.iloc[:, 7]

# Split the dataset into training and testing sets - 60% training, 40% testing
x_train, x_test, y_train, y_test = train_test_split(data, labels, test_size=0.4, random_state=1)

# Create a K-Nearest Neighbors classifier with 30 neighbors
knn = KNeighborsClassifier(n_neighbors=30)

# Train the classifier
knn.fit(x_train, y_train)

# Run the predictions on the test set
y_pred = knn.predict(x_test)

# Calculate the accuracy, precision, and recall
accuracy = accuracy_score(y_test, y_pred)
precision = precision_score(y_test, y_pred, average='micro')
recall = recall_score(y_test, y_pred, average='micro')

print("Accuracy:", accuracy)
print("Precision:", precision)
print("Recall:", recall)
```

Output

```
(env) PS C:\Users\DanielRobbins\Repos\TAS2R38> .\k_nearest_neighbor_predict.py
Accuracy: 0.95
Precision: 0.95
Recall: 0.95
(env) PS C:\Users\DanielRobbins\Repos\TAS2R38>
```

The output of the model running the predictions (displays the accuracy, precision, and recall).

Survey Results



Curriculum

What we've learned

- Ensuring Student Success
  - Not all students start in the same place or learn at the same pace
- Instructors need time and PD to imbed and ensure alignment relevant to industry standards
- Internships:
  - Partners want ASCTE students
  - Possible pay via Scholarships
- Offer diverse electives
  - Arts
  - STEM Deep Dives (Robotics, APs, A.I.)

State Legislative Mandates

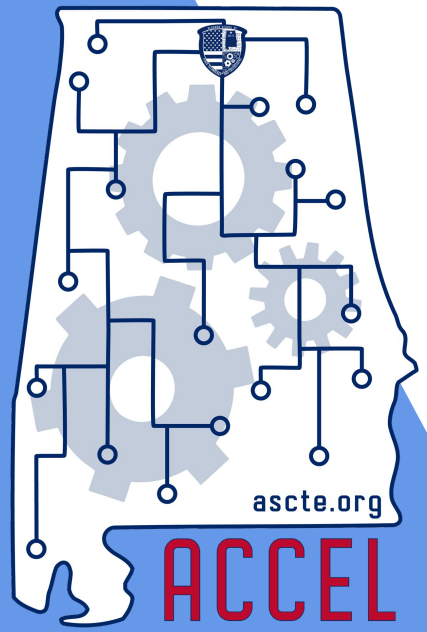
Alabama State Code establishing the Alabama School of Cyber Technology & Engineering Section 16-26D-1 mandates two things:

Mandate #1: Establishment of the independent school.

Mandate #2: ***Section 16-26D-1***

> *"It is the intent of the Legislature to establish an independent, residential school for academically motivated and gifted Alabama students with educational opportunities and experiences in the rapidly growing fields of cyber technology and engineering* ***and to assist teachers, administrators, and superintendents across the state in replicating cyber technology and engineering studies in their own schools. "*** (Act 2018-480, §1.)

What is ACCEL?

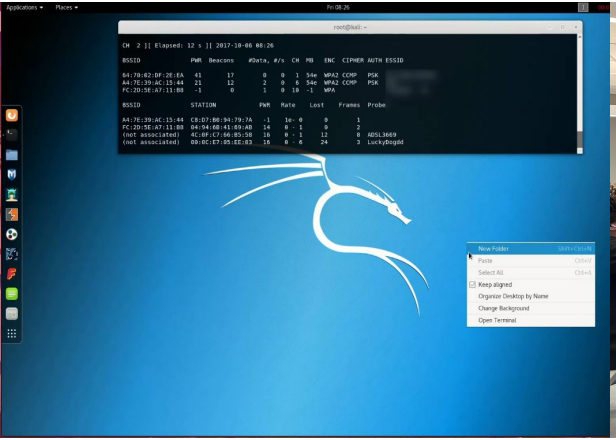


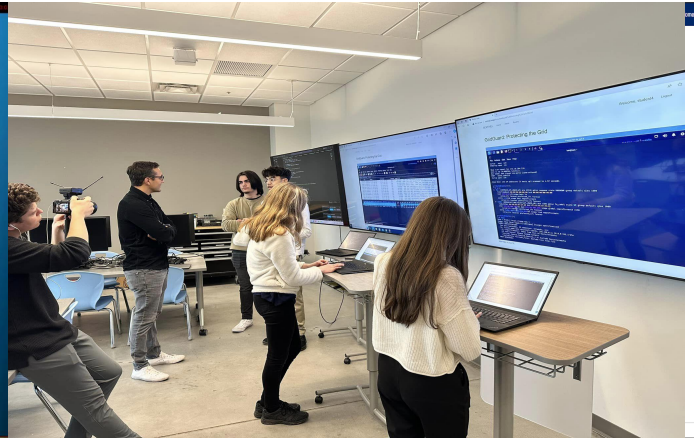
Advancing Cyber Concepts and Engineering Learning (**ACCEL**) is the premier statewide K-12 resource from the Alabama School of Cyber Technology & Engineering (ASCTE). The Alabama Legislation that created ASCTE mandates that the school assist teachers, administrators, and superintendents across the state in replicating cyber technology & engineering studies within their own schools.

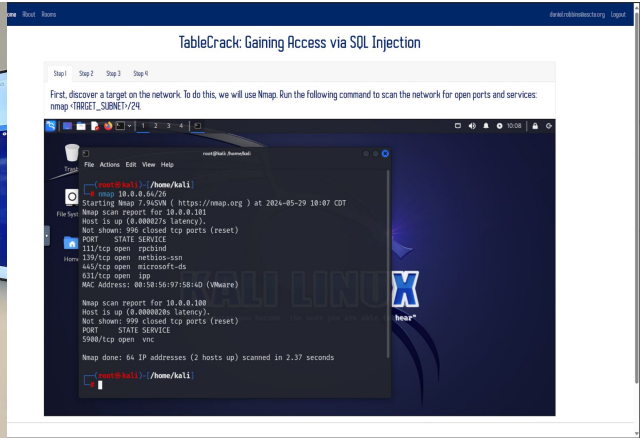
ACCEL 2023-24

- Services
  - Outreach & Engagement
  - Curriculum, Modules, and Challenges
  - Observation, Training, and Professional Development
- Plans
  - Alabama Cyber Range
  - On-demand & Extension Activities
  - Emerging Concepts & Tech Programming

S.E.N.T.I.N.E.L.



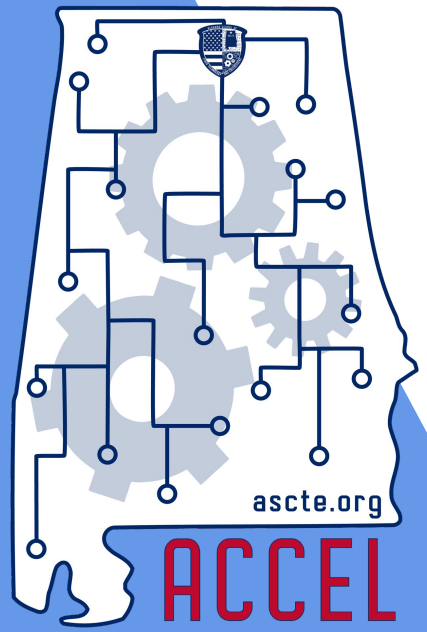




Security & Engineering Network for Technological Innovation & Exploratory Learning

- Custom cyber training environments accessed on-demand
- Isolated from IT enterprise and the web
- Tailored for ease of administration and scalable for all needs

Questions about ACCEL?



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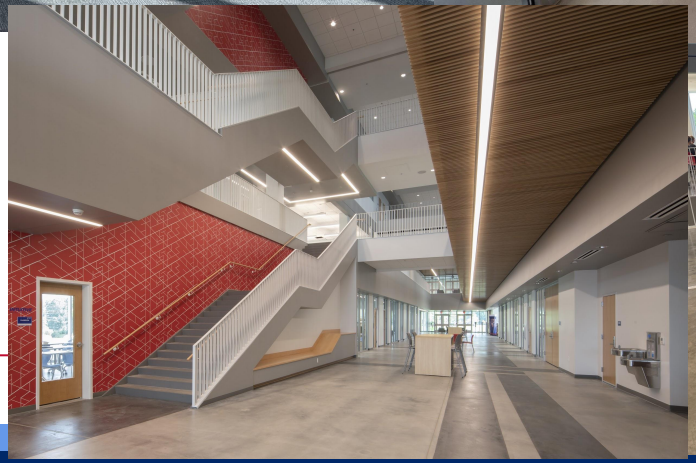

Questions & Discussion