Cybersecurity

Course Description

This is a full year course for students in 9th grade and above. It is designed to foster interest in Information Technology and networking careers. Students taking this course will develop the knowledge and skills required to identify and explain the basics of computing, IT infrastructure, applications, software development, database use, and security concepts. This will prepare students taking this course to take the CompTIA Tech+ (formerly ITF+) certification exam.

Course Objectives

- Identify and understand the purpose of computer components
- Understand how to implement the best IT and security practices
- Define and identify basics
- Compare and contrast different connector types
- Compare and contrast operating systems and their functions and features
- Define and identify basic security threats
- Perform proper steps to set up a basic workstation
- Prepare, take and pass the CompTIA Tech+ exam

Assessing Performance

Formative assessment includes worksheets, interactive activities, and quizzes for each lesson. Summative assessment includes projects and tests for each unit, with a final exam.

Equipment	Cost/Unit
Consumable Material, Reusable Material	$0
Classroom set of computers/Chromebooks	$0 if you already have, $500-$600 per device if you need to purchase
CompTIA Exam	$150

First Semester	
Unit 0: Introduction, Certification & Careers	Course introduction, explanation of certification exams and their importance in IT, career options
Unit 1: IT Concepts & Technology	Basics of computing, notational systems, units of measure, troubleshooting methodology
Unit 2: What is Cybersecurity?	Why cybersecurity matters and is needed
Unit 3: Applications & Operating Systems	Purpose of operating systems, OS components, purpose and proper use of software, web browsers, artificial intelligence
Unit 4: Risk, Adversity & Trust	Importance of trustworthiness in cyberspace
Unit 5: Cryptology	Codes
Unit 6: Software Development Concepts	Programming language categories, programming concepts
Unit 7: Hardware & Software Configuration	Internal computing components, storage types, peripheral devices, input/output devices and interfaces
Unit 8: Threats, Vulnerabilities & Attacks	Attacks and threat sources

Second Semester	
Unit 9: Data & Database Fundamentals	Value of data and information, database concepts, structures
Unit 10: Data Security	Data in cyberspace
Unit 11: Security	Fundamental security concepts and frameworks, best practices, encryption, wireless network installation
Unit 12: Malware & Digital Forensics	Malicious software and digital forensics
Unit 13: Introduction to Networking	Virtualization and cloud technologies, internet service types, networking concepts, authentication, authorization and accounting
Unit 14: States, Statelessness, Sovereignty & Cybersecurity	National Security Council, social values and ideologies
Unit 15: Final & Tech+ Certification Prep	Exam review and practice certification tests

LSU

Gordon A. Cain Center

CYBERSECURITY

1. <u>Materials</u>
Internet access, 1-to-1 computer use daily, and access to LSU servers.

Hardware/Reusable Material	Recommended Unit	Cost/Unit
Raspberry Pi 3 Model B+ Starter Kit - 16 GB (CanaKit)	1 per 3-4 students	$99.95
Mouse/Keyboard/Monitors for at least 1 Raspberry Pi	1 or more (RPis can be used remotely)	Varies*
Wireless Access Point (TP-Link)	1 per classroom	$24.99
Any adapters for using existing school hardware (for monitors): HDMI/VGA adapter or DVI/HDMI adapter	1 per Raspberry Pi	$6-8

*Varies depending on the number of components needed ($20 for mouse/keyboard - $200 if monitor is also needed)

2. <u>Required software, networking access, and access to LSU servers</u>
   - Students will need to sign up with online development and testing environments, including but not limited to those listed below.
   - Students will need access to YouTube instructional videos relevant to the course, as well as other educational video repositories.
   - Teachers will need to be able to access the LSU servers using several Internet protocols including but not limited to HTTPS and SSH.
   - Principals will need to communicate with the district's information technology department to ensure that there are no technological restrictions that block access to the LSU servers in the lsu.edu, college-readiness.lsu.edu or stempathways.lsu.edu domains on any port.
   - Teachers must supervise student internet usage and activities. Teachers are encouraged to teach students their district's responsible usage of technology policy. Teachers are encouraged to get student and parent signatures on a contract of ethical computer usage.
   - In addition to the sites mentioned above, students may need access to additional website.

3. <u>Required teacher collaborations</u>
Teachers may communicate with LSU instructors via emails, apps hosted on the LSU servers, webpages or other methods as indicated by the LSU instructors. Teachers will need to share sample student work with their designated LSU Pathway Point-of-Contact.

4. <u>Required administration of course content, pre/post test, and research instruments</u>
All required materials and instruments will be either posted in the LSU server or their location announced via email.

7. <u>Course Work</u>
Teachers must present the course material in sequence or as approved by collaboration with the LSU Pathway Point-of-Contact. Teachers are expected to deliver a minimum of 80% of the course material.

5. <u>Other</u>

As this is a project-based learning class, we strongly suggest that each section of the course be limited to a *maximum* of 20 students. The course is dependent on the teacher providing feedback and reviewing student code. The course requires that teachers have adequate time to interact with each student.