Course Description:

Cyber Security 1-4 is a series of four, semester-long courses that provide students with a comprehensive understanding of the information security challenges faced by cybersecurity professionals. Students will gain insights into the importance of cybersecurity, the integral role of cybersecurity professionals in the workplace and acquire the skills and knowledge necessary to become industry certified as a Security Professional. The course meets the specifications for the following industry certification programs; TestOut’s SecurityPro, CompTIA’s Security+ and the (ISC)²’s SSCP.

Through rigorous lessons, lab exercises, case studies and projects, students acquire an understanding and appreciation of real-world cybersecurity challenges, policies and practices. Students will explore the principles of data and technology that frame and define cybersecurity. Throughout the courses, students are presented with problem-solving situations for which they must apply technical, academic, and collaborative, problem solving and critical-thinking skills. Foundational cybersecurity principles, security architectures, risk management, attacks, incidents and emerging IT and IS technologies are addressed in the course series.

Students successfully passing each semester-long course will receive one high school credit per quarter. Students earning a grade of B or better in each class will have the ability to receive college credits through an articulation agreement with Pikes Peak Community College.

Students will participate in CyberPatriot competitions and activities as part of the curriculum. Students may also be provided with opportunities to participate in job shadowing, internships, site visits.

Prerequisites:

While not required, it is highly recommended that students complete IT Essentials 1 & 2. Students must have basic knowledge in computer systems and applications and computer networking. Cyber Security course 1 – 4 must be successfully completed in sequence.

Course Goals:

- Acquire the skills and knowledge to safeguard against threats by applying security concepts, tools policies and procedures.
- Explain the core principles of information assurance.
- Appraise the interrelationships among elements that comprise a modern security system, including hardware, software, policies and people.
- Identify the key components of cybersecurity network architecture.
- Develop an understanding of the OSI model, TCP/IP, fixed and wireless networking protocols, ports and VPNs.
- Configure the security settings and policies for Microsoft and Linux host operating systems, applications and network devices.
- Distinguish between system, application, facilities and human security threats and vulnerabilities.
- Describe risk management and business continuity policies, processes and practices.
- Demonstrate the management of security threats through hardening the security of computer systems and network devices.
- Describe the different classes of attacks.
- Analyze threats and risks within the context of the cybersecurity architecture.
- Appraise cybersecurity incidents to apply an appropriate response.
- Critique the current legal, regulatory and public privacy environment as it applies to cybersecurity.
- Explain the roles and responsibilities of Cyber Security professionals.
- Provide an experience-oriented course that employs industry-relevant instructional approaches to prepare students for entry-level jobs in the industry.

Course Summary:

**Cyber Security 1**
- Introduction to cybersecurity
- Access Control and Identity Management
- Cryptography

**Cyber Security 2**
- Cybersecurity policies, procedures and awareness
- Physical Security
- Networking

**Cyber Security 3**
- Network Defenses
- Host Defenses
- Application Defenses

**Cyber Security 4**
- Data Defenses
- Assessments & Audits
- Certification Exam Preparation

**CyberPatriot Competition / Cyber Security CTSO**
Students will participate in the Air Force Association’s National CyberPatriot competition as part of the Cyber Security curriculum. During the competition, students will work in teams to uncover and repair operating system vulnerabilities and to demonstrate their knowledge of networking. The competition will be part of the first two quarters class grade. CyberPatriot competitive rounds run for a period of 6 continuous hours. Based upon an agreed upon schedule, students will be required to either remain in the Cyber Lab for extended time on a Friday evening or come to the lab on a Saturday or Sunday.

Course Alignment to STEM & CTSA Standards:

**STEM Career Cluster Engineering and Technology Pathway Standards Addressed in Cyber Security 1-4**

**SCC01 Academic Foundations**
Achieve additional academic knowledge and skills required to pursue the full range of career and post-secondary education opportunities within a career cluster.

**SCC02 Communications**
Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information.

**SCC03 Problem-Solving & Critical Thinking**
Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams. Solve problems using creativity and innovation.

**SCC04 Information Technology**
Use information technology tools specific to the career cluster to access, manage, integrate, and create information.

**SCC05 Systems**
Understand roles within teams, work units, departments, organizations, inter-organizational systems and the larger environment. Identify how key organizational systems affect the performance and quality of products and services.

**SCC06 Safety, Health & Environmental**
Understand the importance of health, safety and environmental management systems in organizations and their importance to organizational performance and regulatory compliance.

Follow organizational policies and procedures and contribute to continuous improvement in performance and compliance.

**SCC07 Leadership & Teamwork**
User leadership and teamwork skill in collaborating with others to accomplish organizational goals and objectives.

**SCC08 Ethics & Legal Responsibilities**
Know and understand the importance of professional ethics and legal responsibilities.

**SCC09 Employability & Career Development**
Know and understand the importance of employability skills. Explore, plan, and effectively manage careers. Know and understand the importance of entrepreneurship skills.

**SCC10 Technical Skills**
Use the technical knowledge and skills required to pursue the targeted careers for all pathways in the career cluster, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster.

**CTSA Cybersecurity Standards Addressed in Cyber Security 1-4**

**CTSA Level Three: Computer Science in the Modern World**

**Computing Practice and Programming (CPP)**
- Explain the principles of security by examining encryption, cryptography, and authentication techniques.
- Community, Global, and Ethical Impacts (CI)
- Describe how different kinds of software licenses can be used to share and protect intellectual property.
- Discuss the social and economic implications associated with hacking and software piracy.
- Describe security and privacy issues that relate to computer networks.

**Computing Practice and Programming (CPP)**
- Explore principles of system design in scaling, efficiency, and security.
- Deploy principles of security by implementing encryption and authentication strategies.
- Community, Global, and Ethical Impacts (CI)
- Analyze the beneficial and harmful effects of computing innovations.
- Identify laws and regulations that impact the development and use of software.
- Analyze the impact of government regulation on privacy and security.

**Course Resources:**

**TestOut SecurityPro Learning Management System** - [http://www.testout.com/](http://www.testout.com/) Students will be provided with individual account access to the TestOut SecurityPro LMS. This online learning management system contains video tutorials, lab exercise simulations, assessments and practice industry certification exams. It is available for student use 24x7 through internet access and support a range of computers for access.

**Cisco Network Academy** - Security Essentials in the Netcad learning management system. ([www.netacad.com](http://www.netacad.com)) Students will be provided with individual account access to the Cisco Netcad LMS. The complete curriculum for this course is available online for student use 24x7 through internet access and supports a range of computers for access.

**Cisco Packet Tracer**
Cisco Packet Tracer, an innovative network simulation and visualization tool, helps students practice networking configuration skills. Cisco Packet Tracer is available as a free download for Cyber Security students.

**D11 Google Drive:** Students will have access to class materials through their D11 Google Drive accounts.

**Google Classroom:** All assignments will be posted on the Google Classroom site for this course. Students will submit all electronic copies of assignments in Google Classroom. The signature form at the end of this document provides parents with the opportunity to opt in for access to class assignments in Google Classroom.

**Microsoft Office & Google Applications:** Students have D11 accounts and both local and remote access to the Microsoft Office 365 Suite and Google applications. Students are expected to use their D11 Microsoft Office email accounts for this course.

**CyberPatriot:** [https://www.uscyberpatriot.org/](https://www.uscyberpatriot.org/)
Internet Resources / Websites

SANS Institute: https://www.sans.org
National Institute of Standards and Technology (NIST): https://www.nist.gov/topics/cybersecurity
MITRE Common Vulnerability Exposures Database: https://cve.mitre.org
DARKReading: https://www.darkreading.com

Internet Research: Students are expected to make substantial use of web content to conduct research.

Grading and Assessment Policies:

Grading Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Minimum Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>90%</td>
</tr>
<tr>
<td>B</td>
<td>80%</td>
</tr>
<tr>
<td>C</td>
<td>70%</td>
</tr>
<tr>
<td>D</td>
<td>60%</td>
</tr>
<tr>
<td>F</td>
<td>0%</td>
</tr>
</tbody>
</table>

Weighted Components of the Course Grade

<table>
<thead>
<tr>
<th>Category</th>
<th>Percent of Course Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Classwork/Participation</td>
<td>15%</td>
</tr>
<tr>
<td>Lab Assignments</td>
<td>20%</td>
</tr>
<tr>
<td>Quizzes</td>
<td>20%</td>
</tr>
<tr>
<td>Unit Tests</td>
<td>30%</td>
</tr>
<tr>
<td>Exams (Final Exam in Q4)</td>
<td>15%</td>
</tr>
</tbody>
</table>

Assessments

All students will be allowed to reassess on any of the standards for the course provided the following conditions are met:

- The student must attempt the original assessment
- The student must complete a reasonable amount of remediation assigned by the teacher (may be done at home or in class)
- All reassessments must be completed no later than the Friday before final exams begin.

If the reassessment grade is higher than the original assessment grade, the reassessment grade will replace the original.

If a student is present on the day of an assessment, then he/she is required to participate in the assessment regardless of having been absent for any of the instructional days leading up to the assessment. If a student is absent on the day of an assessment, then the instructor may require the student to participate in the assessment immediately upon returning to class, regardless of any instructional days that the student may have missed. Doing this is a benefit to the student as it will prevent them from receiving a zero if they fail to make up the assessment within the allotted time. This also makes the student eligible to reassess on those standards when they are ready.

Attendance & Make-Up Work

It is your responsibility to attend class each day. If you are unable to attend, it is your responsibility to complete your make-up work. You will only be able to make up work from excused absences. Skipping class is not tolerated, and no assignments may be made up due to skipping class.
The number of days allotted to make up work for an excused absence is the total number of consecutive school days that you were absent. You have a minimum of two days to make up work that has been missed. If the work is not completed after the allotted number of days, the grade will be a ZERO.

**Late Work**

The submission of late work will be subject to a reduction in grade. The grade for late work will be subject to a reduction of 10 percentage points for each day late.

**Plagiarism & Cheating**

Student work that is non-original or copied from others will be assigned a grade of ZERO. The grade of ZERO is final and therefore students will not be permitted to reassess nor submit extra-credit work.

**Industry Certification Exams**

Students successfully completing Cyber Security 1-4 will take the TestOut SecurityPro industry certification exam. In addition students will be provided with an option to take the CompTIA Security+ industry certification exams funded by D11. Parents and students must agree to release all industry exam results to the Cyber Security course instructor in order to receive D11 funded participation in these exams. The exams will be taken at a local CompTIA authorized testing center.

**College Credits**

This course offers articulated college credits through Pikes Peak Community College (PPCC). You will earn college credits, paid for by D11, as long as you achieve an 80% or better grade in the class. It is your responsibility to complete an online application with PPCC to receive these articulated credits. The Career Pathway’s Counselor will visit your class to assist you with this process. Completing the online application will be graded as an assignment. When you receive your Student Number (S#), you will earn credit for the assignment. If you do not complete this assignment by the end of the semester, you will receive a zero for the assignment.

**Class Discipline & Procedures:**

The course instructor will review the expectations for discipline and the classroom procedures at the beginning of the course. Students are expected to support a professional, productive work environment in class by adhering to discipline standards and classroom procedures. Students who chose to violate discipline standards or classroom procedures will be subject to disciplinary action and a potential reduction in grade.

**ATTENDANCE AND TARDY POLICY:** Be on time and attend class!

This is a career preparation course; treat it as if it were a paying job where attendance is mandatory and you must be on time. If you arrive late to class you will be marked tardy. If you are not in class or arrive 10 minutes or more after the start of class, you will be marked absent in Q.

Parents/guardians must call in excused absences to both your home school and Early College High School at 719-328-2030. As per District 11 policy, 5 absences/Qtr. on block schedule may result in losing credit for the class and requires a student to appeal.

**CELL PHONE USAGE POLICY: THE USE OF CELL PHONES IS STRICTLY PROHIBITED IN CLASS**

Cell phones will be turned off and stored away during class. Student cell will be confiscated by the instructor if used during class. Confiscated phones will be turned into the ECHS Principal. First offenders may pick up their phone from the ECHS principal at the end of the school day. Repeated violation of the cell phone policy will require a Parent or Guardian will to recover a confiscated phones from the ECHS Principal. Cell phones are not to be used during trips to the restroom.

Parents who need to contact students during class are requested to phone:
Kristine Stenger, Attendance Administrator 328-2030 or Renee Lacey, Assistant to the Principal 328-2031

**Food and Drink in the Lab**

Absolutely no drinks or food are allowed on lab work benches or near lab equipment. Drinks and small snacks may be stored and consumed in a designated area in the rear of the lab.
Missing, Damaged or Destroyed IT Lab Equipment

Students are expected to respect the substantial investment that CSSD11 has made in IT Lab Equipment. Students should therefore exercise a high degree of care and professionalism when using IT Lab Equipment. Students will be expected to reimburse RJWAC ECCP for the repair or replacement cost of any IT Lab Equipment that is missing, damaged or destroyed while in their possession.

Parent/Guardian Connection & Contact:

Parents/Guardians are encouraged to take an active role in their student’s education. Parents/Guardians are invited to contact the instructor by telephone, email, or by setting up time for a face-to-face meeting or visit to the classroom. Additionally, Parent-Teacher conferences provide an opportunity for student or course related discussions.

Parents/Guardians have access to student grades through the Q ParentConnect section of the D11 website.

The instructor will contact a parent/guardian in the event of student discipline issues in the class or poor academic performance.
Early College High School – Career Pathways
Cyber Security 1-4 - Syllabus Signature Page

Parent/Guardian Signature

I have read the syllabus for this course and understand what is expected of my student.

I agree to release to the class instructor my student’s exam results for D11 funded industry certification exams.

I understand students will not be able to be contacted on their cell phones during class.

Should you need to contact your student during class please phone: Kristine Stenger – Attendance Office 328-2030

In addition to contacting your student’s home school, Parents/Guardians must notify the ECHS attendance office at the number above for excused absences or for early dismissal.

I would like to receive access to Google Classroom to view class assignments (email address required)  Yes  No

I grant permission for the course instructor to take pictures or video my student for school-related purposes.  Yes  No

Parent/Guardian Contact Information:

Phone: _________________________  Email: _________________________

Preferred method and time to be contacted: ___________________________________________

_____________________________  ________________________________  ___________
  Parent/Guardian Name (printed)  Parent/Guardian Name (signature)  Date

Student Signature

I have read the syllabus for this course and understand what is expected of me.

I agree to release to the class instructor my exam results for D11 funded industry certification exams.

I understand that the use of cell phones including text messaging is not permitted in class and that I can only be contacted during class through the ECHS attendance office.

I understand that having 5 or more unexcused absences will result in my being dropped from this course.

_____________________________  ________________________________  ___________
  Student Name (printed)  Student Name (signature)  Date