

BACKGROUND INFORMATION

Brief Course Description:

Cyber Security ICT Essentials is an interdisciplinary course designed to prepare students for post-secondary success in the Information and Communication Technologies field. The course engages students with studies of: the history and implication of network communications; the protocols which make the Internet possible; how networks provide access to services; and college and career preparation in the ICT field. This course integrates the theory and application of network communications, and exposes students to media that invites them to consider how Internet engineers think, design, and solve problems. Students have several opportunities to produce college-ready writing, collaborate, research, develop study skills, and develop 21st century skills in this course.

Context for Course:

This course is designed to be part of a Career Technical Education program of study. In that context, this course would be a required CTE course. As the Information and Communication Technologies industry sector thrives and expands, the need for qualified technology professionals continues to grow. This course hopes to address this labor market need by preparing students for the rigors of college level academic work and majors relating to Internet engineering or computer science.

List the State/District Standards addressed in this course.

History of Course Development:

This course was developed in collaboration between two high school ROP/Career Technical Education instructors and a Community College Instructor, all from separate school districts. These educators each have a strong background in instructing networking communications technologies and wanted to develop a rigorous course that prepared students for college-level content and writing.

COURSE GOALS AND/OR MAJOR STUDENT OUTCOMES

Students will learn about theoretical networking models, including the OSI Theoretical Models and the TCP/IP Theoretical Model. While learning about the theoretical and applied design and architecture of different information systems, students also gain understanding of network protocols, distributed algorithms, and challenges and solutions related to information systems design and management. Students analyze the ways in which technology is changing both society and economics through case studies of individuals and firms who have reshaped the global economy. Students acquire the ability to evaluate information system performance at various levels of granularity, with emphasis on network systems level design and performance. They then analyze this real-world data against the theoretical models. Students learn to use binary, hexadecimal, and octal mathematical models to evaluate system throughput, flow, utilizations, etc. In addition, students learn the principles, involved in the formal design and management of computer information systems network and the use of tools such as probability theory, queuing theory, distributed systems, operating systems design, information systems measurement protocols, and heuristic design procedures. As part of their 21st Century College and Career Portfolio, students will show that they have the soft skills necessary to succeed in College and Careers.

COURSE OBJECTIVES

This is an interdisciplinary elective course. This course is designed to prepare students for further study and careers in Computer Science, Computer Engineering, and/or Information Communication Technology.

COURSE OUTLINE

Content Standards	Key Assignments
Unit 1 – Intro to Networks	Learning lab, Guest Speaker, Argumentative Essay
Unit 2 – Networking Protocols	Discussion, Learning Lab, Explanatory Essay
Unit 3 – Network Addressing	Learning Activity, Discussion, Blog, Learning Lab, Team Lab, Team Debate
Unit 4 – Network Access	Blog/Bulletin, Discussion, Learning Lab, Interactive Activity, Argumentative Essay
Unit 5 – It's a Networked World, and I Want to be a Part of it	Case Study, Learning Lab, Resume, Cover Letter, Interview workshops, Blog/Bulletin, College and Career Portfolio, Final Blog

TEXTS AND SUPPLEMENTAL INSTRUCTIONAL MATERIALS

Title, Author, Publisher, Edition:

1. Network Basics ISBN: 9780133475470, Cisco Press, 1st Edition
2. Network Basics Lab Manual ISBN: 9781587133206, Cisco Press, 1st Edition
3. The TCP/IP Guide: A Comprehensive, Illustrated Internet Protocols Reference, Online Textbook, 3rd Edition
4. Information Systems – A Managers Guide to Harnessing Technology ISBN: 2940000955925, Flatworld Knowledge, v. 1.2

Previously Adopted? Yes No (If no, provide information directly below)

Cost per book

Total Cost

Budget Source

Other:

DIFFERENTIATED INSTRUCTIONAL METHODS AND/OR STRATEGIES

ASSESSMENT METHODS AND/OR TOOLS

Several types of assessments will be present throughout the course. Where the assessment type is present in only one unit, that will be noted below.

ASSESSMENT CRITERIA

Argumentative Essays will require students to analyze reading and video (often a TED talk) about various networking-based topics. The students will need to support their argumentative position with evidence from both their readings and the video. There will be an Argumentative Essay or Explanatory Essay in each Unit. Essays will be assessed according to focus, controlling idea, reading/research, development, organization, conventions, and content understanding.

Explanatory Essays will require students to explain specific technical theories and their practical application. Support from their text and other readings will be required. There will be an Argumentative Essay or Explanatory Essay in each Unit. Essays will be assessed according to focus, controlling idea, reading/research, development, organization, conventions, and content understanding.

Unit and Final Exams will be given to students. These will consist of multiple choice, short essay questions, and real-world problem solving scenario simulations. Students must demonstrate mastery of learning outcomes and essential knowledge for each unit during Unit Exams, and for the course during the Final Exam. Students will have opportunities for relearning and retesting.

Learning Labs will be used to assess student application of theoretical concepts presented in the course. The student will also be required to write a summary document describing their performance and their learning. Learning Lab practical activities are assessed through demonstrated content understanding; Lab Summaries are assessed according to content understanding, clarity, and focus.

Packet Tracer **Skills Based Assessments** will be used to assess student application of theoretical concepts presented in the course. The student will also be required to write a summary document describing their performance and their learning.

Team Debate will be used as well. Students, working in teams, will debate the pro/cons of selected networking topics. Students and Teams will be assessed on addressing the issue, supporting with facts, persuasiveness, teamwork, and organization. This will be in Unit 3.

Blog/Bulletin Board Discussions are online wiki- or discussion board-based exercises. Students are required to answer, with evidence to support their position, a prompt from the instructor. They are also required to respond to at least two other students, providing this same type of evidence. These discussions are provided in each of the units. Blog/board posts are assessed according to content understanding, focus, and organization.

Case Studies will present scenarios and students will engage in decision-making, recognizing business opportunities and applying course content knowledge to design an efficient and cost effective Internet business.

The **College and Career Readiness Portfolio** will be prepared for Unit 5. In this portfolio, students will present evidence of their 21st Century College and Career Readiness skills. They will then **defend this portfolio** through a Mock Interview Process with community members. Common assessment rubrics will be used by the interviewing adults to calibrate feedback; the rubric will emphasize the skills critical for the College and Career interview process. The College and Career Readiness Portfolio must contain or demonstrate evidence of independent learning, collaboration, profession/college ready communications, and critical thinking.

HONORS COURSES ONLY

Indicate how this honors course is different from the standard course.