Lecture Contact Hours: 32-36; Outside-of-Class Hours: 64-72;
Laboratory Contact Hours: 48-54; Outside-of-Class Hours: 0;
Total Student Learning Hours: 144-162

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

Computer and Information Science 120 – Computer Maintenance and A+ Certification

2 hours lecture, 2 units
3 hours laboratory, 1 unit
Total units: 3

Catalog Description
Preparation for the A+ Certification exam, an industry-sponsored certification exam that establishes a benchmark level of knowledge and competence expected of computer service technicians in entry-level positions. A+ Certification also serves as the foundation for computer service professionals who are pursuing other valuable industry certifications such as the Cisco Certified Networking Associate (CCNA), Network+, Security+ and Microsoft Certified Professional (MCP). Students will gain a comprehensive knowledge base in computer hardware, and Windows operating systems, networking basics, printers, industry soft skills and customer service. Hands-on labs using the latest computer components and operating systems provide an opportunity for students to enhance their skills in assembling, disassembling, servicing, troubleshooting, and upgrading advanced computer and networking systems.

Recommended Preparation
Basic computer skills (basic knowledge of hardware, operating systems, applications software)

Entrance Skills
Without the following skills, competencies and/or knowledge, students entering this course will be highly unlikely to succeed:
1) Basic knowledge of computer hardware components and their functions.
2) Basic skills using Microsoft Windows operating system.
3) Familiarity with Microsoft Office products.
4) Use a web browser to browse, navigate and conduct research.
5) Follow written instructions.

Course Content
1) Computer Hardware
2) Computer Operating Systems
3) Working with People in a Technical World
4) Form Factors, Power Supplies, and Working Inside a Computer
5) Motherboards
6) Computer Processors
7) Computer Memory
8) Supporting Hard Drives
9) Installing and Supporting Input/Output Devices
10) PC Maintenance and Troubleshooting Strategies
11) Computer Networking
12) Computer Security
13) Supporting Notebook Computers and Printers
14) Installing and Maintaining Windows
15) Troubleshooting and Optimizing Windows

Course Objectives
Students will be able to:
1) Differentiate between computer hardware components (motherboard, CPU, memory, power supply, attachment cards, peripheral devices), standards and models (form factors, Microsoft Windows conventions, components), and industry practices (assembly, preventive maintenance, customer support, etc.) that are used by the computer technician community and describe each of their characteristics and functions.
2) Describe the computer system hardware and software components necessary to assemble a working computer system (including basic components, peripheral devices, connecting cables, operating system, applications software, etc.); identify each of their characteristics and functions, and utilize compatible components to build and troubleshoot a functioning computer system.
3) Design, build, operate and troubleshoot a limited wired and wireless computer network utilizing skills learned in class.
4) Identify prevailing security risks to computer systems (both hardware and software) and explain the precautions used to ensure adequate computer security that keeps data safe from viruses, loss or damage.
5) Develop a computer hardware and operating systems software solution to a real-world business computer resource selection, implementation and maintenance problem using computer component selection and optimization, component integration, test and troubleshooting procedures and techniques learned in class.

Method of Evaluation
A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system.
1) Quizzes and exams that measure students' ability to use computer hardware and operating systems terminology, and explain computer concepts, plans, designs, implementation and troubleshooting concepts.
2) Practical exams that measure students' ability to use computer hardware and operating systems knowledge and skills to demonstrate proficiency in computer hardware components and their interaction, installation, troubleshooting and maintenance as well as installation, troubleshooting and updating of operating systems software.
3) Projects that measure students' ability to conceptualize, build, maintain, upgrade and troubleshoot computer wired and wireless networks.
4) Exercises that measure students' ability to identify security, reliability and availability concerns, and to address these concerns with practical solutions.

Special Materials Required of Student
1) Access to web-based course material and software specified in syllabus

Minimum Instructional Facilities
Computer lab with Internet access, (or applicable web-based instructional material), appropriate software (available in web-based instructional material).

Method of Instruction
1) Lecture and demonstration
2) Hands-on practice
3) Assignments

Out-of-Class Assignments
1) Read textbook (and/or web-based instructional material) and assignment instructions
2) Complete assignments and online quizzes

3) Review online resources, including lectures, instructional videos, demonstrations, fact sheets, and practice certification exam questions.

Texts and References
1) Required (representative example): Prowse, David. CompTIA A+ 220-1001 & 220-1002 authorized Practice Questions Exam Cram, 7th Edition, Pearson Publishing, 2019. ISBN-13: 978-0135566268.
2) Supplemental: LabSim PC Pro (Version 7.0, May 24, 2022) for the A+ 220-1001 & 1002 exam from TestOut corportation. ISBN-13: 978-1-935080-42-8

Exit Skills
Students having successfully completed this course exit with the following skills, competencies and/or knowledge:
1) Identification and description of computer hardware and operating system software concepts.
2) Application of concepts and skills in hardware selection, integration, testing, troubleshooting and maintenance.
3) Application of concepts and skills in operating system selection, installation, troubleshooting, maintenance and upgrade.
4) Application of skills required in planning, designing, implementing, optimizing and troubleshooting limited wired and wireless networks.
5) Descriptive assessment of the characteristics of a computer system that keeps data safe from viruses, loss or damage.
6) Research, select, assemble, test and upgrade computer systems.
7) Descriptive analysis of the purpose and function of computer components, operating systems and system utilities.
8) Description of the functions of peripheral devices, how to optimize them and how they work.
9) Applicable concepts and skills mastery to successfully pass the CompTIA A+ certification exam.

Student Learning Outcomes
Upon successful completion of this course, students will be able to:
1) Complete a comprehensive project including simulated installation, upgrade, troubleshooting, and maintenance of computer hardware and operating systems (>6 elements) that meets 70% of the technical, organizational, structural, and presentation requirements outlined in a detailed scoring rubric based on course content and objectives.