

Lecture Contact Hours: 16-18; Outside-of-Class Hours: 32-36;
Laboratory Contact Hours: 24-27; Outside-of-Class Hours: 0;
Total Student Learning Hours: 72-81

CUYAMACA COLLEGE
COURSE OUTLINE OF RECORD

Computer and Information Science 101 – Fundamentals of Information Technology

1 hour lecture, 1 unit
1.5 hours laboratory, 0.5 units
Total Units: 1.5

Catalog Description

Designed for beginners, no previous computer experience is required. This class introduces students to the various careers that IT has to offer. Students will explore PC Hardware, Operating Systems, Networking, Web design, Programming, Security through highly interactive laboratory exercises:

- Build a personal web page
- Build and secure a home or office network
- Identify computer components assemble a PC, and install an operating system
- Program lights, motors, and devices

When completed, students will have the ability to make informed decisions regarding their educational pathway toward a career in Information Technology.

Prerequisite

None

Course Content

- 1) Computer Hardware and Software
 - a. Functions and major components of computer systems
 - b. Input, output, processing, and storage devices
 - c. System software and application software
 - d. Operating system functions and file management
 - e. Software installation, updating, and maintenance
 - f. Emerging trends in computer hardware and software
- 2) Networks
 - a. Fundamentals of data communication
 - b. Types of networks, including local area, wide area, and wireless networks
 - c. Network hardware and infrastructure
 - d. Internet architecture and common Internet services
 - e. Cloud computing and network-based resources
 - f. Personal, organizational, and societal uses of networks
- 3) Cyber Security
 - a. Current cybersecurity threats, risks, and vulnerabilities
 - b. Malware, phishing, social engineering, and identity theft
 - c. Authentication, passwords, and access control
 - d. Safe computing practices, including secure browsing and email use
 - e. Data privacy, data protection, and information security principles
 - f. Legal, ethical, and social issues related to cybersecurity
 - g. Implementation and maintenance of computer security measures
- 4) Web Design

- a. Principles of effective web page and site design
 - b. Website organization, structure, and navigation
 - c. Fundamental web development concepts and tools
 - d. Accessibility, usability, and responsive design
 - e. Use of text, graphics, multimedia, and interactive elements
 - f. Evaluation of websites for design quality and user experience
- 5) Programming
- a. Fundamental programming concepts and terminology
 - b. Problem-solving strategies and algorithm development
 - c. Variables, data types, operators, and expressions
 - d. Control structures, including sequence, selection, and iteration
 - e. Testing, debugging, and program revision
 - f. Applications of programming in contemporary computing environments
- 6) Physical Computing
- a. Overview of physical computing systems
 - b. Relationships between hardware and software in interactive systems
 - c. Microcontrollers, sensors, and actuators
 - d. Digital and analog input/output concepts
 - e. Design and development of basic physical computing projects
 - f. Real-world applications of embedded and physical computing systems

Course Objectives

Students will be able to:

- 1) Identify the main components of a PC
- 2) Take apart and reassemble a PC
- 3) Describe an Operating system
- 4) Install an Operating system on a PC
- 5) Describe how computer networks function
- 6) Design and build a home or small office network
- 7) Describe common Cybersecurity threats and how to protect a computer and network against these threats.
- 8) Create a personal Web page
- 9) Program a Raspberry Pi to control LED's and motors.

Method of Evaluation

A grading system will be established by the instructor and implemented uniformly. Grades will be based on demonstrated proficiency in the subject matter determined by multiple measurements for evaluation, one of which must be essay exams, skills demonstration or, where appropriate, the symbol system. The following tools will be utilized to assess the student's proficiency:

- 1) Assignments
- 2) Quizzes
- 3) Final Project
- 4) Exams.

Special Materials Required of Student

Flash Drive

Minimum Instructional Facilities

Classroom equipped with computers and access to the Internet

Method of Instruction

Lecture, Demonstration, Labs, and Out-of-Class Assignments

Out-of-Class Assignments

- 1) **Reading:** Cisco NetAcad curriculum content
- 2) **Writing:** Lab documentation and related coursework
- 3) **Other:** Using Cisco NetAcad, Cisco Packet Tracer, and Raspberry Pi devices to complete hands-on labs designed to reinforce concepts learned in the curriculum

Texts and References

- 1) Required (representative example): Computing Essentials 2025: Making IT Work for You; Timothy J. O'Leary, Linda I. O'Leary, Daniel O'Leary, McGraw-Hill Education, 2024; ISBN: 1266816879, 9781266816871; July 2024.
- 2) Supplemental: None

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1) Install an operating system on a PC and identify its components.
- 2) Build, manage, and secure a home or small office network.
- 3) Explain current cybersecurity risks and best practices for implementing and maintaining computer security.