CHT A263: INTRODUCTION TO THE INTERNET OF THINGS

Item	Value
Curriculum Committee Approval Date	10/20/2021
Top Code	070800 - Computer Infrastructure and Support
Units	3 Total Units
Hours	72 Total Hours (Lecture Hours 45; Lab Hours 27)
Total Outside of Class Hours	0
Course Credit Status	Credit: Degree Applicable (D)
Material Fee	No
Basic Skills	Not Basic Skills (N)
Repeatable	No
Grading Policy	Standard Letter (S), • Pass/No Pass (B)

Course Description

The Internet of Things (IoT) is the network of physical objects or "things" embedded with electronics, software, sensors and connectivity to enable it to achieve greater value and service by exchanging data with the manufacturer, operator and/or other connected devices. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure. This course will prepare students to install, configure and maintain these devices. ADVISORY: CHT A110, CIS A110 or IT A110 and CHT A191, CIS A191 or IT A191. Transfer Credit: CSU.

Course Level Student Learning Outcome(s)

1. Install networking infrastructure for real-time, audio and video data using appropriate technologies.
2. Install software on server and client devices to monitor and distribute real-time, audio and video data.

Course Objectives

- 1. Design various subsystems.
- 2. Install various subsystems.
- 3. Maintain various subsystems.
- 4. Integrate various subsystems.
- 5. Compare and contrast current industry standards, codes and regulations.
- 6. Build basic home network including design, configuration and distribution methods.
- 7. Design audio/video, home security and home lighting equipment locations.
- 8. Compare and contrast physical audio/video products and components.
- 9. Describe Telecommunications design and equipment placement.
- 10. Develop installation, troubleshooting and maintenance plans and procedures.

Lecture Content

1.IoT Installation Basics Residental Structured Cabling Installing and Troubleshooting Cabling Cable Termination 2. IoT Computer Networking Network Configurations Resource Sharing Internet Connectivity Network Protection 3. Media Storage and Content Distribution CODECs Streaming Media from the Internet / Local Servers Media Servers Storage Servers 4. IoT Audio / Video Systems Analysis and Design Media Room Audio Video Distributed Audio Video 5. Telecommunications Telephone Systems Plain Old Telephone Service (POTS) Voice Over IP (VoIP) 6. Lighting and Control Systems Control Systems Types Lighting Plans and Design Implementation Techniques 7. Home Security and Surveillance Systems Components Installation Techniques Video Surveillance and Integration 8. Control and Management Systems Heating, Ventalation and Air Conditioning (HVAC) Control Systems Programming 9. Project Management System Design Work Breakdown Structure and Package Activity Resource Estimation Documentation 10. Customer Relations Who is the Customer. Relations with other Contractors / Sub-Contractors Attitude Communications Customer Training

Lab Content

Cable Concepts Build Test CAT5e Patch Cable Build Test CAT5e Punch Cable Build Test Coax Cable Network Installation and Configuration Wired Networks Wireless Networks Peer-to-Peer Networks Client-Server Networks Server Installatin and Configuration Media Server Network Attached Storage Server Content Distibution Install and Configure Distributed Audio/Video Install and Configure Home Theatre Technology Telecommunications Install and Configure Voice over IP Phone Systems Lighting Control Systems Install and Configure X10 Lighting Controls Install and Configure Lutron Lighting Controls Install and Configure TCP/IP Lighting Controls Security Install and Configure Video Surveillance Systems Control Systems Install and Configure Home Control using Android and iPhone Devices

Method(s) of Instruction

- Lecture (02)
- DE Live Online Lecture (02S)
- DE Online Lecture (02X)
- Lab (04)
- DE Live Online Lab (04S)
- DE Online Lab (04X)

Instructional Techniques

Lecture and application of ideas: Students will be presented material from several different sources, including, but not limited to study guides, “Web-based” curriculum, in-class demonstrations of systems integration and personal experiences of industry professionals. Individual and paired exercises: During the lab portion of the class, students will be required to perform many of the tasks of a network administrator. In order to complete several projects, students will need to work together in teams to build working local area networks. Interactive computer-based assignments: Using computer and “Web-based” training tools, students will be working on simulated networks in order to solve problems.

Reading Assignments

Students will spend a minimum of two hours a week reading the Chapter in the textbook in preparation of classroom discussion.

Writing Assignments

Students will spend a minimum of two hours a week preparing a project document, given a minimum set of requirements, designing a solution

accommodating Internet of Things integration (voice, data, video, security, music and lighting) using a combination of wired and wireless networks, home theatre and entertainment systems and wired and wireless security systems. After the solution is designed, the student will create a presentation describing the results.

Out-of-class Assignments

Students will spend a minimum of two hours a week researching Internet of Things products and services. Additionally, students spend a minimum of an additional one hour a week taking weekly quizzes to facilitate the understanding of the material.

Demonstration of Critical Thinking

Reading and writing assignments Web-based research Term or other paper(s) Laboratory reports Problem solving demonstrations Exams Homework problems Skill demonstrations Performance exams Case study presentations Objective examinations, including Multiple-choice True/false Completion

Required Writing, Problem Solving, Skills Demonstration

Given a minimum set of requirements, the student will design a recommended solution accommodating Home Technology Integration (voice, data, video, security, music and lighting) using combination of wired and wireless networks, home theatre and entertainment systems and wired and wireless security systems. After the solution is designed, the student will create a presentation describing the results.

Eligible Disciplines

Computer information systems (computer network installation, microcomputer ...: Any bachelors degree and two years of professional experience, or any associate degree and six years of professional experience.

Other Resources

1. Instructor provided readings and resources.