**Las Positas College**
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**Course Outline for CNT 7601**

**SMART HOME TECHNOLOGY DHTI+**

**Effective: Fall 2008**

I. CATALOG DESCRIPTION:
CNT 7601 — SMART HOME TECHNOLOGY DHTI+ — 4.00 units

This course provides hand-on training in digital home networking and systems integration and will cover the objectives of CompTIA's DHTI+ certification exam. Specific topics covered include: Introduction to HTI; Home Network Design and Configuration; Home Network Central Components and Low-Voltage Wiring; High-Voltage Wiring; Video and Audio Fundamentals; Audio/Video Installation and Setup; Telecommunications and Networking Fundamentals and Installation; Home Lighting Control; Heating, Ventilation and air-Conditioning (HVAC) Management; Water System Management; Miscellaneous Automated Control Systems, TCP/IP, Router/Computer network configuration, Wiring standards, testing and certification, Troubleshooting.

3.00 Units Lecture 1.00 Units Lab

**Strongly Recommended**
CIS 50 - Intro to Computing Info Tech

**Grading Methods:**
Letter or P/NP

**Discipline:**

| | MIN |
|---|---|
| **Lecture Hours:** | 54.00 |
| **Lab Hours:** | 54.00 |
| **Total Hours:** | 108.00 |

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: 2

III. PREREQUISITE AND/OR ADVISORY SKILLS:

**Before entering this course, it is strongly recommended that the student should be able to:**

A. CIS50

IV. MEASURABLE OBJECTIVES:

**Upon completion of this course, the student should be able to:**

A. identify and describe Digital Home Technology Integration concepts;
B. describe the components of a DHTI network
C. install and configure common components of DHTI;
D. identify and discuss the parts of a DHTI design;
E. plan for and configure basic DHTI equipment;
F. demonstrate an understanding TCP, UDP, ARP, DNS and other WAN and LAN concepts as they relate to DHTI;
G. demonstrate the ability to observe and capture network traffic in common LAN topologies;
H. demonstrate and understanding of Windows, Linux and Apple OS X TCP/IP
I. demonstrate the ability to use basic Electronic concepts in HTI wiring and connections;
J. discuss and evaluate network and control wiring testing and certification to EIATIA standards;
K. demonstrate an understanding of TCP-IP windowing;
L. discuss the importance and control of EMI, RFI and ESD in the installation and maintenance of DHTI equipment;
M. describe and demonstrate troubleshooting methods for common DHTI problems.

V. CONTENT:
A. Introduction to DHTI
    1. HTI in the consumer market
    2. Components and functions of a DHTI system
    3. Benefits of DHTI
    4. Skills required for DHTI
B. DHTI Networks
    1. LAN networks for DHTI
    2. Network topologies and standards
    3. Routers, Switches, Computers in a LAN

C. Home Network Design and Configuration
    1. Defining requirements
    2. Identifying services and equipment
    3. Physical and logical design
    4. Creating an RFP
D. Low-voltage wiring
    1. Wiring types and standards
    2. Planning wiring
    3. Installing and terminating
    4. Testing and certifying operation
E. High-voltage wiring
    1. Wiring types, codes and standards
    2. Electrical safety and best practices
    3. Determining requirements and identifying components
    4. Installation, termination and testing
    5. EMI, RFI, grounding and bonding
F. Video and Audio basics
    1. Analog and digital signaling
    2. A/D, D/A conversion, bit rates, sampling, codecs
    3. Broadcast, multicast, unicast systems
    4. Internet streaming, satellite, cable systems
    5. Determining requirements, identifying components
    6. System design issues
G. Video and Audio Installation / Configuration
    1. A/V system components and functions
    2. Configuration for operation and programming
    3. Internal and streamed programming
    4. Preventative maintenance and troubleshooting
H. Security and Access control basics
    1. Access control concepts
    2. Security systems and methods
    3. Design and planning issues
    4. Component designs and characteristics
I. Security Systems
    1. Hardwired, wireless, combination systems;
    2. Security system sensors, components, functions;
    3. Determining requirements and identifying devices;
    4. Planning and installation
    5. Configuration, maintenance, troubleshooting
J. Water / HVAC systems
    1. Design and operation of Water and HVAC systems
    2. Components, operation and functions
    3. Determining requirements and devices
    4. Planning, installing, adjusting control systems
    5. Maintenance, troubleshooting
K. Home Lighting Control
    1. Control design, planning
    2. Lighting systems, capabilities
    3. Design, installation, configuration
    4. Maintenance, troubleshooting
L. Telecommunications, Networks
    1. Analog and digital telecom systems
    2. PSTN and Internet characteristics and capabilities
    3. Planning and specification of systems and devices
    4. Installation, configuration, testing
    5. Maintenance, troubleshooting
M. Other Automated Control Systems
    1. Automated furnishings systems concepts, operation
    2. Door, window, furniture automation
    3. Indoor/Outdoor heating controls, mechanical and lift systems
    4. Determining requirements, identifying devices
    5. Design, installation, configuration, testing
    6. Maintenance, troubleshooting
N. DHTI+ Certification
    1. CompTIA / CEA
    2. objectives
    3. exam

VI. METHODS OF INSTRUCTION:
A. **Lecture** -
B. **Demonstration** -
C. **Research** -
D. **Lab** -
E. Assigned reading
F. **Discussion** -

VII. TYPICAL ASSIGNMENTS:
A. Reading / Listening to presentations and readings 1. Presentations and lectures a. Example: Lecture on Router DHCP configuration 2. Selected current online readings: a. Example: Read DHTI+ Exam objectives, at www.CompTIA.com 3. Search for relevant material and red 4. Students use search engines to find readings relevant for each module a. Example: Find resources describing EIATIA568 A and B wiring standards, select 3 to read 5. Provide comments regarding curriculum 6. Discussion and response questions accompany each module a. Example: “Discuss the effects of poor Cat% wire termination on possible network throughput.” 7. Answer comments and questions from fellow students and instructor 8. Students must participate in group discussion a. Example: On the Distrowatch.com website find 3 prebuilt Linux TIVO ISO CDs and compare their capabilities

VIII. EVALUATION:
A. **Methods**

B. **Frequency**

1. Frequency:
    a. 6-10 module assignments
    b. Weekly discussion of group work
    c. 6-10 module quizzes
    d. 6-10 labs
    e. 1 final project
2. Typical quiz question:
    a. What is the difference between TCP and UDP packets?
    b. Describe the operation of DNS
3. Final exam

IX. TYPICAL TEXTS:

1. Quentin Wells *HTI+ Guide to Home Networking*., Course Technology Publishing, 2006.
2. Quentin Wells *HTI+ Home Technology Integrator and CEDIA* ., Installer Publishing, 2003.
3. Ron Gilster *HTI+ Guide to Home Networking*., Course Technology McGraw-Hill Publishing, 2003.

X. OTHER MATERIALS REQUIRED OF STUDENTS:

A. Students require access to a computer connected to the Internet, with word processing and browser software, and an email address