Engineering Technology –ECET Option

Course Number and name: ET 377 Computer Networking I

Credits & Contact Hours: 3cr. each week has two lectures of 50 min. each, plus a 1 hour 40 minute laboratory per week. Total semester contact hours are approximately 50.

Instructor's name: Dr. Jeff Beasley

Textbook title, author, and year: Networking 2/e, Jeffrey S. Beasley, 2009
supplemental materials - Cisco Networking Academy Semesters 1 and 2

Specific Course Information:

a. **Course Catalog Description -** Computer network design and applications for LAN to WAN, protocols, switches, bridges, routers, NT server, TCP/IP networks, network diagnostics, voice over IP, wireless networks, and the OSI layers from physical to transport.
b. **Prerequisite –** ET 182 Digital Logic
c. This course is required for both the ECET and IET degrees

Course Goals & Objectives:

a. The goals for this class are for the student to develop an introductory understanding of the role of the network administrator. To facilitate this, the student will gain a thorough understanding of configuring, installing, and maintaining various types of networks including office, campus, WAN, and Internet. The students will gain a solid understanding of how to communicate technical issues to the supervisor through preparation of "Memos to the Boss" and follow-up office meetings. The student will gain advanced knowledge in computer network design and application for LAN to WAN to the Internet. The student will learn the basics of the major networking protocols, switches, router configuration, 2003/2008 LAN server administration, TCP/IP networks, network diagnostics, and the OSI layers from physical to transport, and cabling issues.

b. **Related ABET Student Outcomes:** The following are the student outcomes that directly relate to Criterion 3.

an appropriate mastery of the knowledge, techniques, skills and modern tools of their disciplines; including:

1. Digital circuit analysis and design techniques, analysis of analog and digital electronics, architecture and applications of microcomputer systems, **local area networks, and the building, testing, operation and maintenance of electronic, instrumentation, communications,** control, and/or **computer systems** (both hardware and software). Also ABET 2.b, 2.c, 2.d, 2.f

2. **Project management techniques and teamwork necessary for successful electronic and/or computer system designs and implementations, and the effective use of communication skills to prepare technical reports, memos, and presentations.** Also ABET 2.b, 2.c, 2.d, 2.f

3. **The use of** statistics and probability, transform methods, discrete and/or **Boolean mathematics,** algebra, trigonometry and/or calculus mathematics **in support of the analysis, design, and application of** electronic, instrumentation, **communications,** control, **and**/or **computer systems.** Also ABET 2.b, 2.c, 2.d, 2.f

Course topics and lecture hours devoted to each topic:

TOPICS	**HRS.**
• Office LAN Concepts	3
• Physical Layer Cabling Horizontal Cabling, Terminating UTP Cable Testing and Certification, Troubleshooting	5
• Interconnecting the LANs OSI Model, Bridge, Switch, Router, Autonegotiation	3
• TCP/IP TCP/IP layers, IPv4 addressing, Subnet Masks CIDR Blocks, IPv6 addressing	5
• Subnet Masking	2
• Router Configuration Console port connection, Cisco IOS, User EXEC Mode, Privileged EXEC Mode, troubleshooting the router Interface	3
• Routing Protocols static, dynamic, distance vector. link-state, RIP, IGRP, OSPF, EIGRP, analyzing OSPF "Hello" packets	5
• Wide Area Networking Line connection, frame relay, ATM, dial-in access, VPN, Internet routing, BGP, analyzing Internet data traffic	4

Laboratory Projects: Each laboratory class is one block of 1 hour and 40 minutes per week. Laboratory exercises are done once each week in conjunction with the text readings and the lecture materials. The laboratories are designed to apply the theory with the application of the network concepts. Students must take a network task, design, assemble, and troubleshoot the network. **Equipment utilized by the students include (but is not limited to):** Network Hubs, Switches, Routers, network interface cards (NICs), UTP cabling, patch panels, Windows XP computers, Windows 2003/2008 Server, Finisar Shomiti Protocol Analyzer

Example of topics for laboratories include:

Construct an office LAN, use a protocol analyzer, Windows 2008/2003 Server Configuration, terminate UTP patch cables with RJ-45 plugs, punch down RJ-45 jacks, test and certify cable, Subnet lab, Net Challenge Software, use this software to demonstrate that the student can interface to the router in the user and privileged EXEC mode, configure Wide Area Network and a campus LAN, that incorporates: OSPF, EIGRP, Frame Relay Network, Dial-in access, a remote access server (RAS), a VPN network, CSU/DSU connection to Telco, BGP routing

Prepared by: Jeff Beasley **Date: 9/15/10**