

Department of Engineering, Computer Programming, and Technology | Division of Computer Programming and Analysis. Valencia College, West Campus.

CTS 1134C W01 – Network Essentials

Course Syllabus



Andrew Eisler

12/27/2016

Course Description

Prerequisites: None.

This course introduces networking concepts and terminology, including Data Communications and Network Services, OSI Model, Network Topologies, Network Media, Connectivity Devices and Security. At the end of this course students are prepared to take the CompTIA Network+ certification examination.

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| **Instructor** | Andrew Eisler, B.A., M.S., Ed.S. |
| **Title** | Professor, Network Engineering Technologies |
| **Student Interaction****Hours**  |  |
| **E-mail** | **BlackBoard** or aeisler@valenciacollege.edu   (Please use BlackBoard) |
| **Location** | Online |
| **Times** | NA |
| **Start Date** | 01/09/2017 |
| **Course Credits**  | 3.0 |
| **Contact Me** | 321-480-3448 (cell phone) / 407-582-1039 (office) |
| **CRN** | 22835 |



**A syllabus is a roadmap for success in a particular course and is a contract between the student and the instructor.** By participating in this course, the student agrees to, and accepts the terms and conditions of this contract. It is student’s responsibility to carefully read this syllabus, and to adhere to all college policies and course procedures within. The following information provides an overview of the course and class practices.


# Major Competencies (what you will learn)

1. Apply Networking concepts
2. Discuss the OSI and TCP/IP models
3. Apply Data Communications and Network Services
4. Evaluate Network Protocols
5. Contrast Connectivity Devices
6. Implement Topologies and Access Methods
7. Apply Network Security Techniques
8. Implement Virtual Networking


# Required Text

Network + Guide to Networks, 6th Edition, Tamara Dean. Cengage Publishing

**ISBN: 978-1-133-60819-6**

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**Web Site**

Supplementary information for the course is available at:

<https://learn.valenciacollege.edu/>

The BlackBoard Web site contains class notes, PowerPoint slides, class announcements, the course syllabus, test dates, and other information for the course.

**Email**

All students are requested to use their BlackBoard email account. If you have any questions about the course or need assistance, please contact me by e-mail or phone at any time. Also, you may submit lab assignments on the due date (see the Course Modules) by submitting ALL of your work with a date stamp at or before 11:59 P.M. on the due date. Email submissions will not be accepted.

**Grading and Evaluation Criteria**

**Grading**

* The final course grade is based on percentages assigned to the quizzes, labs, and tests that are assigned throughout the course.
	+ A 89.5 to 100 %
	+ B 79.5 to 89.4 %
	+ C 69.5 to 79.4 %
	+ D 59.5 to 69.4 %
	+ F Below 59.4 %

**Points are available as follows:**

* + Test 1: 100 points
	+ Test 2: 100 points

**Tests will count for 40 percent of the grade (20 percent each test).**

**Hands On / Case Project Assignments / Quiz Points**

* There will be hands on and case project assignments (from the back of each chapter) assigned throughout the semester**. These assignments will account for 40 percent of the grade.**
* There will be 7 Quizzes (from the text’s different sections). **Quizzes will count for 20 percent of the grade.**

**Test Policies:**

* Make-up tests are possible if tests are missed, but format and content may vary from test to test. Medical (or other) documentation is required before a makeup exam can be arranged.
* The final exam may be comprehensive.
* Make up tests will not be given for the final exam.

• Exam dates can be found in the Syllabus, the BlackBoard Modules, and on the BlackBoard Course Calendar.

• The Final Exam is mandatory for all students or a grade of “F” will be awarded.

**Course Protocols**

* **Email:** email through BlackBoard is the best way to contact me. Please check your email often for any important information about the course.
* **Missed Lectures**: Students are responsible for obtaining information about assignments and material covered or provided during missed lectures (face-to-face or online) from other students in the course.
* **Late Assignments**: Assignments must be turned in person on the assigned day for full credit. There will be a 20% penalty for projects turned in one day late within the due date and time. There will be a 25% penalty for projects turned in two days within the due date and time. No assignments will be accepted after two days after the Due Date.
* **Academic Integrity**: Plagiarism and cheating of any kind on an examination, homework, project, or any other assignment will not be tolerated. It may result in an “F’ for that assignment (and can, depending on the severity of the case, lead to an “F” for the entire course).  The violation may be subject to appropriate referral to the Office of Student Conduct for further action.
* More than **three unexcused** absences could result in grade F or Withdrawal from class.
* **Failing to take the final exam will result in grade F**.
* **It is the student’s responsibility to withdraw from the course**. Any withdrawal after the withdraw deadline could result in F.
* **No make-up labs, quizzes, homework, or exams are permitted** unless prior arrangement with the instructor has been made.
* You **must satisfactorily complete all course requirements** in order to receive a passing grade including: Laboratory Assignments, Exams, Quizzes, and Projects.
* **All assignments, examinations, and assessments are to be completed individually**. Cheating is prohibited: An incident of academic dishonesty would lead to withdrawing the student from the course with grade letter “F” and may also result in recommendation for expulsion from the program.
* In order to provide you with adequate support, **contacting the instructor via cell phone, Skype, and/or email** is a requirement for this course.
* **Keep all email communications within the BlackBoard email facility** unless your email is about communicating an emergency and/or about a situation of great urgency.

**Important Dates**

Please check the school’s calendar at:

<http://valenciacollege.edu/calendar/>

**Course Requirements:**

Basic computer navigation skills and access to a computer/Internet.

Quality Expectations, Late Work, Missed Deadlines:

* All students in this course are future professionals and candidates for an Associates’ degree. You might be the best technologist on the planet, but all I know about you is the quality of the work you produce in our class. Your work is a direct reflection of you as a professional.
* No assignments will be accepted after two days after the Due Date.
* Failure to upload an assignment correctly is the same as late.
* All tests must be taken during the open window timeline. **Once the exam window closes no make-up exams**.
* Make up exceptions:
	+ If BlackBoard goes down or there’s a similar technical glitch, then I'll adjust the due dates.
	+ If you have an emergency, health issue, extenuating circumstance, jury duty, military duty, contact me. I will need documentation from you before I allow any make-up.
* There is no extra credit anticipated in this course.
* Exams, including a final examination, are online and open-book. The purpose of this course is to prepare you for reading, understanding, and implementing computer concepts in the domain of computer networks.
* Our class calendar on BlackBoard will help you keep on track.


# Electronic Class Work

All class work is electronically submitted to BlackBoard. The Syllabus and course Content will map out each homework, quiz, exam, and reading assignment that is required based on due dates. If you do not understand please ask questions on the Discussion Board in BlackBoard.


# Attendance Policy

You will be held to the required hours of attendance. It is your responsibility to withdraw; I will not do that for you. You may **withdraw by 03/31/2017** for a grade of W. No drinks or food are allowed near the computers. The college recognizes the correlation between participation and both student retention and achievement. Any class session or activity missed, regardless of cause, reduces the opportunity of learning and may adversely affect a student's achievement in the course. Class attendance/participation is required beginning with the first class meeting, and students are expected to attend all class “sessions “for which they are registered. It is the responsibility of the student to arrange all make-up work missed because of legitimate absences and to notify the instructor when an absence will occur.

The instructor determines the effect of absences on grades. However, students who are receiving financial aid or veterans' benefits, which are reported, as never attending a course, will be dropped from the class and benefits adjusted or rescinded. In order to obtain credit for a course, a student must be in attendance at least 85% of the contact hours listed for a particular course. The instructor may withdraw any student from the course if they miss more than 15% of the scheduled class sessions and activities. Students must be enrolled before they can attend class.

**Instructor-Specific Attendance Policy**

Instructors are required to monitor their attendance and report students who are not attending class during the designated reporting periods - normally on a monthly basis - each term. Faculty members shall publish and distribute a class syllabus at the beginning of each course. Instructors may require a more rigorous attendance policy due to program requirements or state mandates of 100% attendance. Specific course requirements will be noted in their syllabi.

**Note**: Veterans should refer to the college catalog for more information about attendance.


# Your academic progress in required and that requires you to attend each meeting day where lack of progress and or absences could result in an impact to your grade. This includes not receiving a passing grade or loss of a letter grade regardless of your assignment grades. You should not miss more than 4 graded assignments. You should not miss more than 3 days of online class interaction.


# Academic Honesty and Plagiarism

* Collaboration and discussion is encouraged in all course aspects other than actually completing the assigned work (exams, homework, projects, etc.). Indeed, collaboration often leads to increased understanding of the material being covered. If you have questions about an assignment, I encourage you to speak up and ask questions about it.
* Plagiarism is a form of fraud and will not be tolerated. You are expected to do your own work. Copying text or images from any source and claiming it as your own is considered plagiarism. Submitting copied text as your entire answer on a homework or project, even if you cite the source, is also a form of dishonesty. I want to read YOUR words, see your work, not someone else's.
* Any form of academic dishonesty will be appropriately addressed. Valencia College subscribes to the plagiarism detection resource Turnitin.com. This website provides online access to software designed to search the internet and compare submitted material to online content and provide the results of that comparison to the user and thus acts as a mechanism to reveal plagiarism. All faculty reserve the right to request that assignments be submitted as electronic files and electronically submit assignments to Turnitin.com. Assignments are compared automatically with a large database of journal articles, web articles, and previously submitted papers. The instructor receives a report showing exactly how a student's paper was plagiarized. For more information, go to [http://www.turnitin.com](%20http%3A//www.turnitin.com%20) and http:// [www.ugs.usf.edu/catalogs/0304/adap.htm](http://www.ugs.usf.edu/catalogs/0304/adap.htm) [.](http://www.ugs.usf.edu/catalogs/0304/adadap.htm#plagiarism)
* The complete Valencia College student code of conduct can be found on the following site:  [http://catalog.valenciacollege.edu/academicpoliciesprocedures/studentcodeofconduct/](%20http%3A//www.easternflorida.edu/student-life/student-handbook.cfm%20.)

**Office for Students with Disabilities**

Students with documented disabilities that desire to receive services including special testing conditions, or who need specific accommodations, should register with the Office for Students with Disabilities (OSD) in the Student Services Building (SSB), Rm. 102). Please call the West Campus OSD office at 407-582-1523. They will take care of you! There are no disadvantages in registering, and everything is kept confidential. It does not get written on your transcript or diploma that services were ever received. Services may not be received without registering. Additionally, services and accommodations are not retroactive.

**Course Schedule**

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| --- | --- | --- | --- |
| **Week** | **Module/Lesson Title**  | **Learning Outcomes** | **Assignment** |
| 1 | Course Introduction | * Course Objectives
* Syllabus Review
* Online Introductions
 | Review syllabus.Review course objectives.Participate in the Class Cafe’ found in BlackBoard Discussions.  |
| 2 | Introduction to Networking | * List the advantages of networked computing relative to stand-alone computing
* Distinguish between client/server and peer-to-peer networks
* List elements common to all client/server networks
* Describe several specific uses for a network
* Identify some of the certifications available to networking professionals
* Identify the kinds of skills and specializations that will help you excel as a networking professional
 | Read Chapter 1* Answer Review Questions 1 through 20 pages 26-29
* Complete and Submit Project 1-2 pages 30 to 33
* Complete and submit Project 1-3 pages 33 to 35
 |
| 3 | Networking Standards and the OSI Model | * Identify organizations that set standards for networking
* Describe the purpose of the OSI model and each of its layers
* Explain specific functions belonging to each OSI model layer
* Understand how two network nodes communicate through the OSI model
* Discuss the structure and purpose of data packets and frames
* Describe the two types of addressing covered by the OSI model
 | Read Chapter 2* Answer Review Questions 1 through 20 pages 67-70
* Complete and Submit Project 2-1 pages 70 to 71
* Complete and submit Project 2-2 pages 71 to 72
* Complete and submit Project 2-3 pages 72 to 73
 |
| 4 | Transmission Basics and Networking Media | * Explain basic data transmission concepts, including full duplexing, attenuation, latency, and noise
* Describe the physical characteristics of coaxial cable, STP, UTP, and fiber-optic media
* Compare the benefits and limitations of different networking media
* Explain the principles behind and uses for serial cables
* Identify wiring standards and the best practices for cabling buildings and work areas
 | * Read Chapter 3
* Answer Review Questions pages 132 to 135
* Complete and submit Hands On Project 3-1 on page 135
* Complete and submit Case Projects 3-1, 3-2, and 3-3 starting on page 137
 |
| 5 | Introduction to TCP/IP Protocols | * Identify and explain the functions of the core TCP/IP protocols
* Explain the TCP/IP model and how it corresponds to the OSI model
* Discuss addressing schemes for TCP/IP in IPv4 and IPv6 and explain how addresses are assigned automatically using DHCP (Dynamic Host Configuration Protocol)
* Describe the purpose and implementation of DNS (Domain Name System)
* Identify the well-known ports for key TCP/IP services
* Describe how common Application layer TCP/IP protocols are used
 | * Read Chapter 4
* Answer Review Questions pages 187 to 190
* Complete and submit Hands On Project 4-1, 4-2, 4-3, and 4-4 starting on page 190
* Complete and submit Case Project 4-1, and 4-2 starting on page 195
 |
| 6 | Topologies and Ethernet Standards | * Describe the basic and hybrid LAN topologies, and their uses, advantages, and disadvantages
* Describe the backbone structures that form the foundation for most networks
* Compare the different types of switching used in data transmission
* Explain how nodes on Ethernet networks share a communications channel
* Identify the characteristics of several Ethernet standards
 | Read Chapter 5* Answer Review Questions pages 231 to 234
* Complete and submit Hands On Projects 5-1 and 5-2 starting on page 234
* Complete and submit Case Projects 5-1 and 5-2 starting on page 239
 |
| 7 | Network Hardware, Switching, and Routing | * Identify the functions of LAN connectivity hardware
* Install, configure, and differentiate between network devices, such as NICs, hubs, bridges, switches, routers, and gateways
* Explain the advanced features of a switch and understand popular switching techniques, including VLAN management
* Explain the purposes and properties of routing
* Describe common IPv4 and IPv6 routing protocols
 | Read Chapter 6* Answer Review Questions starting on pages 282 to 285
* Complete and submit Case Project 6-1, 6-2, 6-3, and 6-4 starting on page 289
 |
| 8 | Wide Area Networks (WANs) | * Identify a variety of uses for WANs
* Explain different WAN topologies, including their advantages and disadvantages
* Compare the characteristics of WAN technologies, including their switching type, throughput, media, security, and reliability
* Describe several WAN transmission and connection methods, including PSTN, ISDN, T-carriers, DSL, broadband cable, broadband over powerline, ATM, and SONET
 | Read Chapter 7* Answer Review Questions starting on page 334
* Complete and submit Hands On Projects 7-1 on page 238
* Complete and submit Case Projects 7-1, 7-2, and 7-3 starting on page 341.
 |
| 9 |  | **Test 1** |  |
| 10 |  | **S P R I N G B R E A K** |  |
| 11 | Wireless Networking | * Explain how nodes exchange wireless signals
* Identify potential obstacles to successful wireless transmission and their repercussions, such as interference and reflection
* Understand WLAN (wireless LAN) architecture
* Specify the characteristics of popular WLAN transmission methods, including 802.11 a/b/g/n
* Install and configure wireless access points and their clients
* Describe wireless WAN technologies, including 802.16 (WiMAX), HSPA+, LTE, and satellite communications
 | Read Chapter 8* Answer the Chapter 8 Review Questions starting on page 386
* Complete and submit Case Projects 8-1, 8-2, and 8-3 starting on page 394.
 |
| 12 | In-Depth TCP/IP Networking | * Describe methods of network design unique to TCP/IP networks, including subnetting, CIDR, and address translation
* Explain the differences between public and private TCP/IP networks
* Describe protocols used between mail clients and mail servers, including SMTP, POP3, and IMAP4
* Employ multiple TCP/IP utilities for network discovery and troubleshooting
 | Read Chapter 9* Answer the Chapter 9 Review Questions starting on page 435
* Complete and submit Hands On Projects 9-1 and 9-2 starting on page 439
* Complete and submit Case Projects 9-1, 9-2, and 9-3 starting on page 444.
 |
| 13 | Virtual Networks and Remote Access | * Explain virtualization and identify characteristics of virtual network components
* Create and configure virtual servers, adapters, and switches as part of a network
* Describe techniques for incorporating virtual components in VLANs
* Explain methods for remotely connecting to a network, including dial-up networking, virtual desktops, and thin clients
* Discuss VPNs (virtual private networks) and the protocols they rely on
* Identify the features and benefits of cloud computing and NaaS (Network as a Service)
 | Read Chapter 10* Answer the Chapter 10 Review Questions starting on page 476
* Complete and submit Hands On Projects 10-1, 10-2 and 10-3 starting on page 480
* Complete and submit Case Project 10-1 on page 491
 |
| 14 | Network Security | * Identify security threats and vulnerabilities in LANs and WANs and design security policies that minimize risks
* Explain security measures for network hardware and design, including firewalls, intrusion detection systems, and scanning tools
* Understand methods of encryption, such as SSL and IPSec, that can secure data in storage and in transit
* Describe how user authentication protocols, such as PKI, RADIUS, TACACS+, Kerberos, CHAP, MS-CHAP, and EAP function
* Use network operating system techniques to provide basic security
* Understand wireless security protocols, such as WEP, WPA, and 802.11i
 | Read Chapter 11* Answer the Chapter 11 Review Questions starting on page 545.
* Complete and submit Case Project 11-1 and 11-2 starting on page 553
 |
| 15 | Troubleshooting Network Problems  | * Describe the steps involved in an effective troubleshooting methodology
* Follow a systematic troubleshooting process to identify and resolve networking problems
* Document symptoms, solutions, and results when troubleshooting network problems
* Use a variety of software and hardware tools to diagnose problems
 | Read Chapter 13* Answer the Chapter 13 Review Questions starting on page 634
* Complete and submit Case Project 13-1, 13-2, and 13-4 starting on page 640
 |
| 16 | **Final Exam (Chapters 7 to 13)** | **Final Exam** | Final Exam (Chapters 7 to 13) |

**12 – Jan (M)**

**2 – Mar (M)**

**9 – Mar (M)**

**16 – Mar (M)**

**23 – Mar (M)**

**30 – Mar (M)**

**6 – April (M)**

**13 – April (M)**

**Disclaimer**

The Syllabus is subject to change at any time and in any manner – the professor will announce any changes in class, or by Announcement in BlackBoard.



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