IT 280 – Computer Networking
Course Syllabus and Calendar – Fall 2011

Professor Don Colton

Brigham Young University Hawaii

1 Course Overview

It is hard to imagine a world without the Internet. Networking has made the sharing of information much faster than it was before. We get emails and instant messages with pictures attached instead of waiting days for postal delivery. We register "online" for classes instead of waiting "in line" to pull computer cards. We buy worldwide from eBay or locally from Craig's List instead of visiting our local bricks-and-mortar store.

People want to be connected. The world needs workers with technical skills. This course is focused on those skills: creating wiring, connecting computers, and making networks.

This course is an introductory course that will prepare you to understand, set up, and operate your own home network, or small business, or maybe even Internet Café. You will understand the fundamentals of networking and what things are necessary for success with those activities.

This course lays the foundation to prepare you to take other courses in the IT major.

IT 426, Computer Network Servers, is an advanced course where you can develop skill and experience configuring and operating network servers.

IT 480, Computer Network Design, is an advanced course where you can develop skill and experience configuring networking equipment such as switches and routers.

1.1 Syllabus is Subject to Change

This course is undergoing changes. It is possible that I will revise one or more major aspects of the course as we go along. Any changes I make are likely to be to your advantage. If any of my changes seems unfair to you, let me know. I will try to correct it.

1.2 Prerequisites

None. (CIS 101, Beginning Programming, was a prerequisite, but not any more.)

2 Course Details

- **Course Number:** IT 280
- **Title:** Computer Networking
- **Was:** Data Communications Systems
- **Course Description:** End-user fundamentals including local area networks, home networks, wireless networks, routers, firewalls, ports, address sharing, dynamic host configuration, OSI model, IPv4, netmasks, subnets, and troubleshooting.
- **Textbook:** Networking 101, by Don Colton.
- **Classroom:** GCB 111
- **Class Time:** MWF 2:30 PM to 3:30 PM
- **Class Dates:** Sep 14 to Dec 14, 2011
- **Final Exam:** Fri, Dec 16, 5:00 to 6:50 PM

2.1 Important Website Links

- **Don Colton Home Page (General):** http://doncolton.com/
- **Prof Colton Home Page (BYUH):** http://byuh.doncolton.com/
- **IT 280 Course Home Page:** http://byuh.doncolton.com/it280/
- **Networking 101 Textbook:** PDF http://n101.doncolton.com/
- **IT 280 Grade Book and Exams:** https://dcquiz.byuh.edu/

2.2 The Instructor

- **Instructor (me):** Don Colton
- **My email:** doncolton2@gmail.com
- **My Office:** GCB 128
- **Office Hour:** MWF 11:00 – 11:30 AM
- **Office Hour:** MWF 3:30 – 4:00 PM

I may digitally record the audio of my lectures some days.

3 Learning Objectives

The following is a statement of the high-level learning objectives for this course. Each objective can be further divided into many smaller objectives.

By the conclusion of this course, students will do the following:

Internet: Explain how the Internet works. This includes topics such as connecting to the Internet, using the domain name system and using dynamic host configuration.

Home Networking: Properly set up a home network. List and explain the different objects, media, and devices used in a home network that is connected to the Internet through an ISP. Design, install, configure, and manage a simple LAN, install services, and connect the LAN to the Internet.

Wireless Networking: Design, install, configure, and manage a simple wireless LAN. This includes channel selection, WEP/WPA, SSID, and antenna considerations.

Security: Explain what security typically exists and how to get more. Includes password selection, firewalls, and issues with opening up ports for gaming.

Servers: Explain how to set up printer sharing and file sharing in the context of Microsoft Windows.

Theory: Explain the following basic concepts: OSI 7-layer stack, protocol data units (packets, frames, etc.), udp, tcp, arp, and ports.

IPv4 Addressing: Explain network masks, subnetting, address classes, private IP addresses, MAC addresses, collision domains, broadcast domains, and what a LAN is.

Power Tools: Demonstrate the use of common network applications and utilities including ping, traceroute, ipconfig, dig, nmap, ssh, telnet, ftp, and Wireshark.

4 Grading

I maintain an online gradebook so you can see how your points are adding up and so you can compare your points with other students in the class (without seeing any names).

Grading uses a standard 60/70/80/90 model based on 1000 points.

Readings

☐ R1 : Read 1-4 by Sep 19 at 2:30 PM.
1x=25p, 2x=38p, 3x=44p

☐ R2 : Read 5-8 by Sep 26 at 2:30 PM.
1x=30p, 2x=45p, 3x=53p

☐ R3 : Read 9-11 by Oct 10 at 2:30 PM.
1x=25p, 2x=38p, 3x=44p

☐ R4 : Read 12-13 by Oct 24 at 2:30 PM.
1x=20p, 2x=30p, 3x=35p

☐ R5 : Read 14-16 by Nov 14 at 2:30 PM.
1x=30p, 2x=45p, 3x=53p

☐ R6 : Read 17-19 by Nov 28 at 2:30 PM.
1x=40p, 2x=60p, 3x=70p

☐ R7 : Read 20-21 by Dec 5 at 2:30 PM.
1x=30p, 2x=45p, 3x=53p

Readings are worth roughly one point per page, for a total of 200 points. The points and due dates are listed above. If you read a complete section twice by the deadline, you get an extra 50% of the points for extra credit. If you read a complete section three times by the deadline, you get another 25% more points for extra credit. Your maximum score for readings is 200 regular points and 150 extra credit points.

If you find an error in the textbook, either typographical or grammatical or punctuation or any other kind of error, and if you are the first to bring it to my attention, and if I agree that it is an error, you will receive extra credit for it, typically five points per error, up to 100 points for the semester.

Lab activities (L1-L3) (mostly done in class) are worth 80 points.

Exams (E1-E7) based on memorization of the book answers are worth 600 points.

Exams (E8) based on skills taught in the book are worth 120 points.

Grading is based on 1000 points

930+	A	900–929	A–	870–899	B+
830–869	B	800–829	B–	770–799	C+
730–769	C	700–729	C–	670–699	D+
630–669	D	600–629	D–	0–599	F

If a pretake of an exam is given, it is an opportunity for students to try answering the questions before the official exam date. Pretakes may be graded or not, at the instructor's discretion. If the pretake is graded, students will have the option to keep the pretake score or take the actual exam later, as though the actual exam were a retake.

In the case of a completed retake of an exam, the later score will always be used. Students may have the opportunity to cancel a retake and keep their old score before the retake is graded.

The Final Exam will probably consist of an opportunity to retake any or all exams previously given.

Total points is 1000, plus around 250 extra credit points.

5 General Calendar

Wed Sep 14 Overview
Fri Sep 16 E1: Exam 1 Practice
Mon Sep 19 R1: ch 1-4, Basics, 25p
Wed Sep 21
Fri Sep 23 E1: Exam 1, Basics, 90r, 80p
Mon Sep 26 R2: ch 5-8, OSI, 30p
Wed Sep 28
Fri Sep 30 E2: Pretake?
Mon Oct 3 L1: Build a Cable, 30p
Wed Oct 5
Fri Oct 7 E2: Exam 2, OSI, 168r, 150p
Mon Oct 10 R3: ch 9-11, Home, 25p
Wed Oct 12
Fri Oct 14 E3: Pretake?
Mon Oct 17 L2: Configure a Router, 30p
Wed Oct 19
Fri Oct 21 E3: Exam 3, Home, 100r, 90p
Mon Oct 24 R4: ch 12-13, WiFi, 20p
Wed Oct 26
Fri Oct 28 E4: Pretake?
Mon Oct 31 L3: Site Survey, 20p
Wed Nov 2 ISECON, No Class
Fri Nov 4 ISECON, No Class
Mon Nov 7
Wed Nov 9
Fri Nov 11 E4: Exam 4, WiFi, 56r, 50p
Mon Nov 14 R5: ch 14-16, Security, 30p
Wed Nov 16
Fri Nov 18 E5: Pretake?
Mon Nov 21
Wed Nov 23 E5: Exam 5, Security, 100r, 90p
Fri Nov 25 Thanksgiving, No Class
Mon Nov 28 R6: ch 17-19, IPv4, 40p
Wed Nov 30
Fri Dec 2 E6: Exam 6, IPv4, 78r, 70p
Mon Dec 5 R7: ch 20-21, Tools, 30p
Wed Dec 7
Fri Dec 9 E7: Exam 7, Tools, 74r, 70p
Mon Dec 12 E8: Pretake?
Wed Dec 14 E8: Exam 8, IPv4 Calc, 60r, 120p
Fri Dec 16 **Final Exam** 5:00-6:50 PM (2h)

6 BYUH Learning Framework

I believe in the BYUH Framework for Learning. If we follow it, class will be better for everyone.

Prepare: Before class, study the course material and develop a solid understanding of it. Try to construct an understanding of the big picture and how each of the ideas and concepts relate to each other. Where appropriate use study groups to improve yours and others understanding of the material.

In IT 280: Do the readings on time. There is more than we could cover in class because we all learn at different rates. Our in-class time is better spent doing activities and answering your questions than listening to my lectures.

Engage: When attending class actively participate in discussions and ask questions. Test your ideas out with others and be open to their ideas and insights as well. As you leave class ask yourself, "Was class better because I was there today?"

In IT 280: Participate in the in-class activities. Those that finish first are requested to help those that want assistance. It is amazing what you can learn by trying to help someone else.

Improve: Reflect on learning experiences and allow them to shape you into a more complete person: be willing to change your position or perspective on a certain subject. Take new risks and seek further

opportunities to learn.

In IT 280: After each exam, with possible rare exceptions, I allow you to see every score and every comment and every answer submitted for every question. Review your answers and those of other students. See how your answers could be improved. If you feel lost, study the assigned readings again.

7 Standard Statements

All syllabi are encouraged or required to address certain topics. These are generally considered to be common sense, but we find that it is useful to mention them explicitly anyway.

7.1 Dress and Grooming Standards

The dress and grooming of both men and women should always be modest, neat and clean, consistent with the dignity adherent to representing The Church of Jesus Christ of Latter-day Saints and any of its institutions of higher learning. Modesty and cleanliness are important values that reflect personal dignity and integrity, through which students, staff, and faculty represent the principles and standards of the Church. Members of the BYUH community commit themselves to observe these standards, which reflect the direction given by the Board of Trustees and the Church publication, "For the Strength of Youth." The Dress and Grooming Standards are as follows:

Men. A clean and neat appearance should be maintained. Shorts must cover the knee. Hair should be clean and neat, avoiding extreme styles or colors, and trimmed above the collar leaving the ear uncovered. Sideburns should not extend below the earlobe. If worn, moustaches should be neatly trimmed and may not extend beyond or below the corners of mouth. Men are expected to be clean shaven and beards are not acceptable. (If you have an exception, notify the instructor.) Earrings and other body piercing are not acceptable. For safety, footwear must be worn in all public places.

Women. A modest, clean and neat appearance should be maintained. Clothing is inappropriate when it is sleeveless, strapless, backless, or revealing, has slits above the knee, or is form fitting. Dresses, skirts, and shorts must cover the knee. Hairstyles should be clean and neat, avoiding extremes in styles and color. Excessive ear piercing and all other body piercing are not appropriate. For safety, footwear must be worn in all public places.

7.2 Accommodating Special Needs

Brigham Young University Hawaii is committed to providing a working and learning atmosphere which reasonably accommodates qualified persons with disabilities. If you have any disability that may impair your ability to complete this course successfully, you are invited to contact the Students With Special Needs Coordinator at 808-675-3518. Reasonable academic accommodations are made for all students who have qualified documented disabilities.

7.3 Plagiarism

http://en.wikipedia.org/wiki/Plagiarism has a wonderful article on plagiarism. Read it if you are not familiar with the term. Essentially, plagiarism is when you present the intellectual work of other people as though it were your own. This may happen by cut-and-paste from a website, or by group work on homework. In some cases, plagiarism may also create a violation of copyright law. If you borrow wording from someone else, identify the source.

Intentional plagiarism is a form of intellectual theft that violates widely recognized principles of academic integrity as well as the Honor Code. Such plagiarism may subject the student to appropriate disciplinary action administered through the university Honor Code Office, in addition to academic sanctions that may be applied by an instructor.

Inadvertent plagiarism, whereas not in violation of the Honor Code, is nevertheless a form of intellectual carelessness that is unacceptable in the academic community. Plagiarism of any kind is completely contrary to the established practices of higher education, where all members of the university are expected to acknowledge the original intellectual work of others that is included in one's own work.

In this course group work is permitted and encouraged but you are not allowed to turn in work that is beyond your understanding, whether you give proper attribution or not. Make sure you understand what you are submitting and why each line is there.

On exams you are required to work from personal memory, using only the resources that are normally present on your computer. This means the exams are closed book and closed notes. However, you are nearly always allowed (and encouraged!) to test your program by actually running it on the computer where you are sitting. Students caught cheating on the final exam may receive a grade of F for the semester, no matter how many points they may have earned, and they will be reported to the Honor Code office.

Faculty are responsible to establish and communicate to students their expectations of behavior with respect to academic honesty and student conduct in the course. Observations and reports of academic dishonesty shall be investigated by the instructor, who will determine and take appropriate action, and report to the Honor Code Office the final disposition of any incident of academic dishonesty by completing an Academic Dishonesty Student Violation Report. If the incident of academic dishonesty involves the violation of a public law, e.g., breaking and entering into an office or stealing an examination, the act should also be reported to University Police. If an affected student disagrees with the determination or action and is unable to resolve the matter to the mutual satisfaction of the student and the instructor, the student may have the matter reviewed through the university's grievance process.

7.4 Sexual Harassment

BYUH's policy against sexual harassment complies with federal Title IX of the Education Amendments of 1972 to protect university students from student-to-student sexual harassment both in and out of the classroom setting. Any incidents of such student-to-student harassment should be reported to either the Director of Human Resources (675-3713) or the Honor Code Office (675-3531). Allegations of sexual harassment are taken seriously. Upon receiving a report of sexual harassment, the Director of Human Resources will take appropriate action to resolve and correct conditions resulting from individual perceptions or from inappropriate behavior.