IT 280 – Computer Networking
Course Syllabus and Calendar – Summer 2012

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 Amazon or eBay or locally from Craig's List instead of visiting our local bricks-and-mortar store. We research on Google instead of at the library.

People love being connected. But sometimes networks break. 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, such as:

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 There May Be Changes

Like all courses I teach, I will be keeping an eye out for ways this one could be improved. Changes generally take the form of opportunities for extra credit, so nobody gets hurt and some people may be helped. If I make a change to the course and it seems unfair to you, let me know and I will try to correct it. If you are brave enough, you are welcome to suggest ways the class could be improved.

1.2 Preparation

We assume you have no special networking experience whatever. We expect you can read, type, send and receive email, and visit web sites. Everything else we will teach you.

2 Course Details

- **Course Number:** IT 280
- **Title:** Computer Networking
- **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
- **Start/End (1):** Apr 23 to Jun 8, 2012
- **Start/End (2):** Jul 16 to Aug 31, 2012
- **Class Time:** MWF 8:40 to 9:40 AM
- **Final Exam:** Fri, Aug 31, regular class time

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/
- **My Learning Management System:**
  (Grade Book, Exams, etc.)
  https://dcquiz.byuh.edu/

2.2 The Instructor

- **Instructor (me):** Don Colton
- **My email:** doncolton2@gmail.com
- **My Office:** GCB 128
- **Office Hour:** MWF 12:10 – 1:10 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.

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

Grading is on a standard 60/70/80/90 model using 1000 points, plus about 76 bonus 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

https://dcquiz.byuh.edu/ is my personal Learning Management System. There I maintain an online grade book. You can see how your points are adding up. You can compare your points with other students in the class (without seeing any names).

You earn points for (R) readings 200, (E) exams 360, (L) labs 200, and (S) skills 240. The total is 1000.

R1, R2, etc., are readings in our textbook, "Networking 101," (abbreviated N101 below). They are worth roughly one point per page, for a total of 200 points. The points and due dates are listed below. **Bonus:** If you read a complete unit twice by the deadline, you get an extra 10% of the points for extra credit. If you read a complete unit three times by the deadline, you get another 10% more points for extra credit. Your maximum score for readings is 200 regular points and 40 extra credit points.

E1, E2, etc., are readings-based exams. They are mostly based on memorization of the book answers. They are worth 360 points. **Pretake:** Most E exams have a pretake the week before. They are worth 10% more (34 points extra credit). **Retakes:** In the

case of a completed retake of an E 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.

N101, Unit 1, Basics, chapters 1-4.
R1: (25) Read it by Apr 30 at 8:40 AM
E1: (40) Exam on May 4 (pretake Apr 27)

N101, Unit 2, OSI, chapters 5-8.
R2: (30) Read it by May 7 at 8:40 AM
E2: (80) Exam on May 18 (pretake May 11)

N101, Unit 3, Home Networking, chapters 9-11.
R3: (25) Read it by May 21 at 8:40 AM
E3: (50) Exam on Jun 1 (pretake May 25)

N101, Unit 4, Wi-Fi, chapters 12-13.
R4: (20) Read it by Jun 4 at 8:40 AM
E4: (20) Exam on Jun 8 (no pretake)

N101, Unit 5, Security, chapters 14-16.
R5: (30) Read it by Jul 16 at 8:40 AM
E5: (50) Exam on Jul 27 (pretake Jul 20)

N101, Unit 6, IPv4, chapters 17-19.
R6: (40) Read it by Jul 30 at 8:40 AM
E6: (80) Exam on Aug 10 (pretake Aug 3)

N101, Unit 7, Power Tools, chapters 20-21.
R7: (30) Read it by Aug 13 at 8:40 AM
E7: (40) Exam on Aug 24 (pretake Aug 17)

Lab Activities (200).
L1: (80) Lab, Build Cables
L2: (80) Lab, Configure a Router
L3: (40) Lab, Wi-Fi Site Survey

Skills-based Exams (240).
SN: (120) q25 Skill Numbers
SS: (120) q50 Skill Subnets
SV: (100) q51 VLSM Subnets (extra credit)

The SN and SS skills-based exams are based on skills taught in the book or in class and are worth 240 points (120 each). The SV exam is extra credit and will only be discussed lightly. It is covered in the text book. It is an all-or-nothing situation involving about ten questions. **Retakes:** Because these are easy to grade but can require time to master, you can take these each exam day, and your highest score will be kept.

Bonus: 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.

5 General Calender

Readings must be completed before the start of class on the day they are due.

Exams happen each Friday. They are closed-book, closed-notes, closed-neighbor, etc. You can bring blank paper. **Some memorization is helpful.**

All other calendar items are "best guess" and may or may not happen as planned.

The blank days will probably be used in studying for the skills tests: numbers, subnets, and possibly VLSM.

Summer 1

Mon Apr 23	Overview	
Wed Apr 25	E1, SN, SS prac	
Fri Apr 27	E1 pretake	
Mon Apr 30	R1 ch 1-4, Basics, 25pt	
Wed May 02		
Fri May 04	E1 Basics	
Mon May 07	R2 ch 5-8, OSI, 30pt	
Wed May 09	L1 Build Cables, 80pt	
Fri May 11	E2 pretake	
Mon May 14		
Wed May 16		
Fri May 18	E2 OSI	
Mon May 21	R3 ch 9-11, Home, 25pt	
Wed May 23	L2 Configure Router, 80pt	
Fri May 25	E3 pretake	
Mon May 28	Memorial Day Holiday, no class	
Wed May 30	L3 Site Survey, 40pt	
Fri Jun 01	E3 Home	
Mon Jun 04	R4 ch 12-13, Wi-Fi, 20pt	
Wed Jun 06		
Fri Jun 08	E4 Wi-Fi	

Summer 2

Mon Jul 16	R5 ch 14-16, Security, 30pt	
Wed Jul 18		
Fri Jul 20	E5 pretake	
Mon Jul 23		
Wed Jul 25		
Fri Jul 27	E5 Security	

Mon Jul 30 R6 ch 17-19, IPv4, 40pt
Wed Aug 01
  Fri Aug 03 E6 pretake
Mon Aug 06
Wed Aug 08
  Fri Aug 10 E6 IPv4
Mon Aug 13 R7 ch 20-21, Tools, 30pt
Wed Aug 15
  Fri Aug 17 E7 pretake
Mon Aug 20 WireShark
Wed Aug 22
  Fri Aug 24 E7 Tools
Mon Aug 27
Wed Aug 29
  Fri Aug 31 Finals, Last Day of Summer-2

The Final Exam time is only one hour. I plan that it will consist of an opportunity to retake any or all exams previously given. If you are already satisfied with your scores, you can skip the final.

6 Tutoring and Study Groups

6.1 Study Groups

You are encouraged to form a study group. For this class, one of the helpful things a study group can do is quiz each other on the exam questions. The questions are mostly memorization, but they create the opportunity for discussion, specifically about what I meant by each question or answer. Discussion is good.

The skills exams are another good topic for a study group. You can ask each other for help on how to do the problems.

6.2 Tutoring

The CIS department provides tutoring in GCB 111, Monday through Friday, typically starting around 5 PM and ending around 11 PM (but earlier on Fridays). Normally a schedule is posted on one of the doors of GCB 111.

Tutors can be identified by the red vests they wear when they are on duty.

Not all of the tutors know about networking. But all of the tutors should know which tutors do know about networking, so they can direct you toward the best time to get your questions answered.

There are networking-savvy student workers in GCB 103. They are not dedicated tutors like the 111 tutors. Instead, they work on building the CIS network and maintaining the CIS labs. But they are sometimes available to answer questions.

If you still need help, please come and see me, even outside my posted office hours. My door is always open.

7 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.

8   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.

8.1   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.

8.2   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.

8.3   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.

IT 280: 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.

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.

8.4   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 (808-675-3713) or the Honor Code Office (808-675-3531). 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.