IT 280 – Data Communications Systems
Course Syllabus and Calendar – Winter 2008

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Note: Effective January 1, 2008 this course has been renamed from IS 280 to IT 280, better reflecting its core technical content. During the Winter 2008 semester the course will be known by both names to simplify the transition process.

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 will prepare you to take other courses in the IT major. IT 426 (formerly IS 386) Computer Network Servers and IT 480 (formerly IS 389) Computer Network Design build on your knowledge from IT 280. In IT 426 you can develop skill and experience configuring and operating network servers. In IT 480 you can develop skill and experience configuring networking equipment such as switches, routers, and gateways.

1.1 First Half

The first half of the semester we will concentrate on what you need to set up your own home network. The second half of the semester we will extend that knowledge to networking a business.

1.2 Prerequisites

Before taking this class, it helps to understand the big picture of why networking is important and how it supports people, businesses, and organizations in achieving their goals. IS and IT students are expected to have completed CIS 100, Fundamentals of Information Systems and Technology with a grade of B- or better. If you are a CS student, the prerequisite is waived.

It is helpful if you have completed the IT 224 (was IS 254) course covering computer hardware and the Microsoft Windows operating system.

1.3 The Course

- **Course Number:** IT 280
- **Title:** Data Communications Systems
- **Web:** http://colton.byuh.edu/courses/it280/
- **Required Text:** *CCNA Intro Exam Certification Guide*, by: Wendell Odom. ISBN 1-58720-094-5. $30.
- Class Time: MWF 8:00–8:50 AM
  Final Exam: Wed 23 Apr, 7:00–10:00 AM
  Classroom: GCB 140

1.4 The Instructor

- **Instructor:** Don Colton
- **My email:** don@colton.byuh.edu
- **My Office:** GCB 130 B
- **Office Hours:** Daily 11:00–11:50 AM

1.5 Labs and Tutoring

- **Assistant:** Scott Milbury
- **Wed Hours:** 3:30 to 5:50 PM
- **Thu Hours:** 6:00 to 8:50 PM
- **Tue Hours:** 9:00 to 11:50 PM
- **Location:** GCB 143

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–	300–599	F

	Grading Point Categories	Max Pts
R	reading or TestOut videos	200 pts
L	evening lab activities	300 pts
P	two term papers	100 pts
Q	in-class Friday quizzes	100 pts
M	Midterm exam	100 pts
F	in-class Final exam	200 pts
T	Total Points Available	1000 pts

1.6   My Open-Door Policy

My office hours are shown above. You can contact me by email to make an appointment at another time. I also have an open-door policy: **If my door is open (even just a bit) feel free to knock and come in.**

2   Grading

Grading uses a standard 60/70/80/90 model based on 1000 points. Scores below 300 points will generally get a grade of UW unless the student has been making a visible effort to attend and do the work.

Points can be earned in six different categories: Reading, Labs, Papers, Quizzes, Midterm, and Final. In each category, points can be earned up to the maximum specified. Make-up credit is often available within each category, so most people will get a perfect score even though they will miss a few points here or there. Extra points do not carry over to your final grade.

Some true extra credit points *may* be announced for special activities during the semester.

2.1   Chapter Readings

Chapter readings are very important, and are worth (a maximum of) 200 points toward your final grade, according to the number of pages you read in each chapter by each chapter due date, one point per page. There are 266 total assigned pages. (The other 66 pages are "safety net" in case you miss the deadline on some part of the readings.)

We will talk about the following chapters of the textbook. For each chapter a date is specified. That is the date by which you must read the chapter to get the points. (If you do not read it until later, you probably get knowledge, but you may get no points.)

If for some reason you are still less than 200 points by the end of the semester, you can make up points by watching TestOut videos. Each Networking video you watch completely is worth (min/5) points, rounded up. So, for example, if a video is 3 minutes long, it is worth 1 point. If it is 6 minutes long, it is worth 2 points. If it is 9 minutes long, it is still worth 2 points. To get these points, you must report your watching to Bro Colton in writing (email is okay, but verify that I got it) by the last day of class.

2.2   Lab Activities

You will sign up for a regular scheduled lab time: Wednesday from 3:00 to 5:50, Thursday from 6:00 to 8:50, or Tuesday from 9:00 to 11:50. Labs have up to fifteen students in each one. Labs meet weekly for up to three hours, but usually much less.

Lab activities are hands-on experiences. They are very important, and are worth (a maximum of) 300 points toward your final grade.

In any particular week if you have a conflict with your regular time, you can attend one of the other labs if you get permission from the Teaching Assistant (based on space available).

For this semester we have eight labs planned. Each lab will be worth 50 points. If you complete six out of the eight labs, you should have a perfect score.

2.3   Term Papers

Two term papers are worth a maximum of 100 points toward your final grade. Each paper is worth 50 points.

The first paper is a Network Design Paper that looks at how to implement a network for your parents. You are given a set of requirements. Your paper must tell specifically how to meet those requirements. The exact requirements are given online.

The second paper is an Ethics Paper that will look at questions of right and wrong surrounding a networking question. You must write in support of the question, and you must write in opposition to the question. The exact topic and due date will be given later.

2.4 Friday Quizzes

Friday Quizzes are worth a maximum of 100 points toward your final grade. Eight quizzes are planned, but there may be more or less. Each quiz is worth the same amount. The points will be scaled so that if you average 80% of the quiz points, you will get 100% in this category. Each quiz will be the last few minutes of class.

Networking, like many classes, involves a lot of vocabulary with specialized meanings. A big part of the Friday Quizzes may be involved with explaining vocabulary terms like "WiFi" or "Router" to an appropriate level of detail.

Some techniques are also studied and may be tested during these quizzes, such as, given an IP address and a net mask, calculate the broadcast address.

2.5 Midterm Exam

The midterm exam is worth (a maximum of) 100 points toward your final grade. The exam will be given in class (probably), on or about Feb 29.

Points will be on the basis of your raw score that gets scaled. Basically I chop off the top 15 percent of the class (those over achieving curve-raisers) and make the next score equal to 100 percent. The top 15 percent is 3 in a class of 20, or about 5 in a class of 30.

2.6 Final Exam

The final exam is worth (a maximum of) 200 points toward your final grade. The exam will be given in the regular classroom during the regular final exam time.

Points will be on the basis of your raw score that gets scaled. Basically I chop off the top 15 percent of the class (those over achieving curve-raisers) and make the next score equal to 100 percent. The top 15 percent is 3 in a class of 20, or about 5 in a class of 30.

3 Expected Outcomes

This course is intended to give students an understanding of networking and telecommunications. The expected outcomes for this course are that the student will be able to do the following.

1. Explain the history of networks, and the Internet.

2. Explain the different objects, media, and devices necessary for telecommunications, including local and wide area networks.

3. Explain how to install the equipment necessary to implement a telecommunication system, e.g., cables, modems, Ethernet connections, hubs, switches, and gateways.

4. List network architectures, topologies, and protocols.

5. Identify network standards and standardization bodies.

6. Explain logical addressing (IPv4), subnetting, network classes, private IP addresses, and MAC addresses.

7. Design, install, configure, and manage a simple LAN, install services, and connect the LAN to the Internet. (This outcome may be better associated with the IS250L or IS386.)

8. Identify common network services including: file, print, mail, communication, and Internet services.

9. Identify the importance of DHCP and DNS servers.

10. Identify the responsibilities inherent in providing network services including: security, privacy, reliability, and performance.

11. Explain the economics of networks in organizations, e.g., total cost of ownership, and cost-benefit analysis.

12. Demonstrate the use of common network applications such as: SSH, Telnet, FTP, remote access, e-mail, and IP telephony.

13. Demonstrate how to use TCP/IP utilities like: ping, trace route, netstat, nslookup, whois, ipconfig, and ifconfig.

4 Additional 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.

4.1 Accommodating Special Needs

I am personally committed to making this course as easy as possible (but no easier). To fully teach important concepts, I give lab work, but it is not constrained by the amount of time available in class. I publish important assignments on my web site so you do not have to rely on note taking or memory

to know what you need to do. I believe that many cases of special needs are already accommodated by these practices.

For overall fairness I require those who need a special accommodation to establish their rights by working through the BYUH Special Needs Coordinator.

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, Leilani A'una at 293-3518. Reasonable academic accommodations are made for all students who have qualified documented disabilities.

4.2   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.

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.

4.3   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 (293-3713) or the Honor Code Office (293-3531). 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.

4.4   Syllabus is Subject to Change

It is possible that I will revise 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.

5   Course Calendar

Monday	Wednesday	Friday
	Jan 9 day 1	Jan 11 day 2
Jan 14 day 3 R1: ch 1, 9 pp 5-13	Jan 16 day 4 L1: Perfect Cat5 Cable	Jan 18 day 5 Q1: Vocabulary
Jan 21 Holiday: Human Rights	Jan 23 day 6 L2: Perfect Crossover Cable	Jan 25 day 7 Q2: QAC Address Classes
Jan 28 day 8 R2: ch 2, 22 pp 15,20-40	Jan 30 day 9 L3: LAN without Internet	Feb 1 day 10 Q3: QCA Classful Addressing
Feb 4 day 11 R3: ch 3, 28 pp 47-73	Feb 6 day 12 L4: LAN with Internet	Feb 8 day 13 no quiz
Feb 11 day 14 R4: ch 4, 25 pp 81-105	Feb 13 day 15 L5: Wireless Network	Feb 15 day 16 Q4: Vocabulary
Feb 18 Holiday: Presidents	Feb 20 day 17 P1: Network Paper Due	Feb 22 day 18 no quiz
Feb 25 day 19 R5: ch 5, 27 pp 114-140	Feb 27 day 20 L6: Separate Nets with DMZ	Feb 29 day 21 Midterm in class
Mar 3 day 22 R6: ch 6, 18 pp 149-166	Mar 5 day 23 L7: Separate Nets with WiFi	Mar 7 day 24 Q5: QSS Simple Subnets
Mar 10 day 25 R9: ch 9, 21 pp 234-254	Mar 12 day 26 L8: Troubleshoot Broken Net	Mar 14 day 27 Q6: Qbh Binary Conversion
Mar 17 day 28 RA: ch 10, 13 pp 263-275	Mar 19 day 29	Mar 21 day 30 Q7: Q10 Base10 Conversion
Mar 24 day 31 RB: ch 11, 25 pp 283-307	Mar 26 Holiday: Kuhio Day	Mar 28 day 32 no quiz
Mar 31 day 33 P2: Ethics Paper Due	Apr 2 day 34	Apr 4 day 35 no quiz
Apr 7 day 36 RC: ch 12, 39 pp 319-357	Apr 9 day 37	Apr 11 day 38 Q8: QSN Complex Subnets
Apr 14 day 39	Apr 16 day 40 RF: ch 15, 39 pp 435-473	
	Apr 23 Final Exam, 7 AM to 10 AM	