IT 280 – Computer Networking
Study Guide – Winter 2015-16

Professor Don Colton
Brigham Young University–Hawai'i

February 10, 2016

Short Cuts

- Calendar Mon, Feb 08 2.32 (page 69) tba
- Calendar Wed, Feb 10 2.33 (page 70) ch32-ch33
- Calendar Fri, Feb 12 2.34 (page 71) L3 prac
- Calendar Wed, Feb 17 2.35 (page 72) L3 try 3

Study Guide

This is the **Official Study Guide** for the IT 280, Computer Networking, taught by Don Colton, Winter 2015-16.

This study guide is focused directly on "what" and "when." It talks about the description and grading of the exams and labs. It tells what is required for each one.

http://byuh.doncolton.com/it280/2161/sguide.pdf has the latest version of this study guide. **It may be updated throughout the semester,** if new assignments are made, and if due dates are revised, and if clarifications are developed.

Syllabus

http://byuh.doncolton.com/it280/2161/syl.pdf is the official syllabus for this course. It is largely reproduced in Chapter 1 (page 5) below.

Text Book

This study guide is a companion to the text book for the class.

The textbook tells "why" and "how." Its role is explaining things and telling how to make things work.

The textbook is "Networking 101: An Introduction To Networking," by Don Colton. It is available in PDF form, free.

Free textbook (short URL): http://n101.tk/

Alternate URL for textbook: http://n101.doncolton.com/

The textbook is 99% stable, but new material is occasionally added and chapter numbering may even change. It has a good index.

Networking 101
An Introduction to Networking

Don Colton
Brigham Young University Hawaii

November 21, 2012

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Chapter 1

Syllabus Extracts

Contents

The syllabus is intended to be stable and reliable. I publish the syllabus at the start of the semester, and then I do not make any substantial changes in it except in case of extreme emergency.

The study guide, on the other hand, gets changed and updated throughout the semester.

This chapter of the study guide simply repeats, for your convenience, material given in the syllabus. In case it differs from the syllabus, the syllabus itself is always correct and authoritative, and this study guide is probably out of date.

1.1   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 sign up in person. We buy worldwide from Amazon or eBay or locally using 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 the wiring, connecting the 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 technical 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 Services: Installation, configuration, and management of network services such as file servers and directory services with an emphasis on Microsoft Windows.

IT 480, Computer Network Design: Networking of computers and configuration of managed networking equipment including switches and routers, with special emphasis on Cisco equipment and protocols.

IT 481, Information Assurance and Security: Introduction to information security providing a foundation of computer security concepts, including general security, communication security, infrastructure security, basics of cryptography, and operational and organizational security.

1.1.1   Expected Proficiencies

As you begin this course, we assume you have no special networking experience whatsoever. We expect you can read, type, send and receive email, and visit web sites. We will teach you everything else you need to know.

Ideally you will have your own personal computer, probably a laptop. You will probably also have a Wi-Fi enabled device such as a smart phone.

1.2 Course and Faculty

1.2.1 Course Information

- **Title:** Computer Networking
- **Course Number:** IT 280
- **Course Description:** (from the catalog) 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.
- **Prerequisites:** none
- **Semester/Year:** Winter 2015-16
- **Semester Code:** 2161
- **Meeting Time:** MWF 11:00 to 12:00
- **Location:** GCB 111
- **First Day of Instruction:** Mon, Nov 09
- **Last Day to Drop:** Fri, Dec 11
- **Last Day to Withdraw:** Wed, Jan 20
- **Last Day of Instruction:** Mon, Feb 22
- **Final Exam:** Wed, Feb 24, 10:00 to 12:50

1.2.2 Faculty Information

- **Instructor:** Don Colton
- **Office Location:** GCB 128
- **Office Hours:** (In GCB 111) MWF 14:30-15:00, TuTh 15:30-16:00.
- **Email:** doncolton2@gmail.com
- **Campus Homepage:**
  http://byuh.doncolton.com/ is my campus homepage. It has my calendar and links to the homepages for each of my classes.
- **Off-Campus Homepage:**
  http://doncolton.com/ is my off-campus homepage.

I have reserved GCB 111 on MWF from 14:30 to 15:30 (right after my CIS 101 class) and on TuTh from 15:30 to 17:00 (right after my IT 240 class) so my students (and others) can study in a lab setting and meet with me and each other. I will be there at the start of those hours, and will stay as long as students are asking me questions. I also allow the room as an Open Lab for your use either individually or in groups, for my class or for other

classes.

1.2.3   Course Readings and Materials

- **Textbook:** (free!)
  http://n101.tk/ Networking 101, An Introduction To Networking, covering Internet Basics, Home Networks, Wi-Fi, Security, and IPv4. By Don Colton.
- **Learning Management System:**
  https://dcquiz.byuh.edu/ is the learning management system for my courses.
- **Course Homepage:**
  http://byuh.doncolton.com/it280/ is my course homepage. It has links to many things including the syllabus, study guide, and textbook.
- **Study Guide:**
  http://byuh.doncolton.com/it280/2161/sguide.pdf is the study guide for this course this semester. It is fairly well indexed and includes a copy of the main parts of this syllabus. The study guide may be updated throughout the semester as assignments are made and deadlines are established or updated.

1.3   Calendar

Items marked u1, u2, u3, etc., pertain to unit 1, 2, or 3, etc. Items marked chNN or chNNNN pertain to chapters (probably tests). The first two digits are the first chapter involved, and the last two digits are the last chapter.

Mon	Nov	09	Getting Started
Wed	Nov	11	ch01 prac
Fri	Nov	13	ch01
Mon	Nov	16	ch02 ch03
Wed	Nov	18	L1 lab
Fri	Nov	20	ch04 ch05
Mon	Nov	23	ch06
Wed	Nov	25	SN prac
Fri	Nov	27	Thanksgiving
Mon	Nov	30	L2 lab
Wed	Dec	02	ch09-ch11

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  Fri Dec  04  SN prac
Mon Dec  07  ch12
Wed Dec  09  SN exam
  Fri Dec  11  ch13
Mon Dec  14  L3 preview
Wed Dec  16  ch14-ch18
  Fri Dec  18  L3 try 1
Mon Jan  04  ch19-ch20
Wed Jan  06  SS SV prac
  Fri Jan  08  ch21-ch23
Mon Jan  11  SS SV prac
Wed Jan  13  SS SV try 1
  Fri Jan  15  ch24-ch25
Mon Jan  18  Human Rights Day
Wed Jan  20  SS SV review
  Fri Jan  22  ch26
Mon Jan  25  L3 try 2
Wed Jan  27  ch27
  Fri Jan  29  L4 lab
Mon Feb  01  ch28-ch30
Wed Feb  03  ch31
  Fri Feb  05  SS SV try 2
Mon Feb  08  tba
Wed Feb  10  ch32-ch33
  Fri Feb  12  L3 prac
Mon Feb  15  Presidents Day
Wed Feb  17  L3 try 3
  Fri Feb  19  Wireshark
Mon Feb  22  Wireshark
Wed Feb  24  Final Exam
```

We meet 38 times including the final exam.

All tests are closed-book, closed-notes, closed-neighbor, etc. You can bring blank paper.

1.4   Grading

I use a 60/70/80/90 model based on 1000 points.

Based on 1000 points

930+	A	900+	A–	870+	B+
830+	B	800+	B–	770+	C+
730+	C	700+	C–	670+	D+
630+	D	600+	D–	0+	F

The 1000+ points are divided up as follows.
- Attendance 38+2 points.
- Chapter Tests 620 points.
- Skills Tests 180 points.
- Labs 160 points.

1.4.1 IT 280 Grade Books

In my Learning Management System (DCQuiz), I keep several online grade books so you can see how your points are coming along. This lets you compare yourself with other students in the class (without seeing their names).

2161 IT 280 Overall Grade Book: This includes the totals from all the other grade books. This is where you can find your final grade at the end of the course.

2161 IT 280 (whatever) Grade Book shows your points in the (whatever) category. (whatever) is Chapter or Attendance.

1.4.2 Attendance (38+3 points)

Each day in class starts with the "daily update" (DU). It is my way of reminding you of due dates and deadlines, sharing updates and news, and taking roll. It is your way of saying something anonymously to each other and to me. It must be taken in class at a classroom computer during a window of time that starts a few minutes before class and ends 5 minutes into class.

Attendance Policy: You must attend to complete the Daily Update and thereby earn the Attendance points. You must attend to take the Chapter Tests and thereby earn the Chapter Test points. You must attend to take the Skills Tests and thereby earn the Skills Test points. Besides that, there is no penalty for being late or lack of attendance. It is possible to earn the Lab points without attending.

2161 IT 280 Attendance Grade Book shows your attendance points, one point per day, for 38 days. You get one point for each time you do the daily update. If you arrive too late to complete the daily update, you will not receive the attendance points for that day.

Tardiness: My tardiness policy is that you should arrive in time to complete the daily update. Generally if you are less than four minutes late, you will have time to complete the daily update before the deadline.

+3: In addition to attendance, there are a few other things that are recorded here for tracking purposes, including completion of the email assignment and the policy test.

1.4.3 Policy Test

To ensure that each student is aware of the important policies I have for this course, I have prepared a policy test covering things you are required to know.

Mostly it has true/false questions about acceptable behaviors and cheating. I want to know that you know where the line is.

You must pass this test with a perfect (100%) score in order to pass this class. You will be given all the questions and answers in advance. You will have several chances to pass the policy test. The deadline for passing the policy test is Fri, Dec 11, which is also the last day to drop the class.

1.4.4 Tests

All tests, quizzes, and exams are closed-book, closed-notes, closed-neighbor, etc. You can bring blank paper. **Some memorization is required.**

The midterms (if any) and final each consist of an opportunity to retake some or all of the chapter tests and skills tests previously given. If you are already satisfied with your scores, you can skip class or leave early. There may be other opportunities to retake tests.

The Final Exam time is Wed, Feb 24, 10:00 to 12:50. The final exam time provides a chance to retake any or all chapter tests and skills tests.

1.4.5   Chapter Tests (620 points)

There are assigned readings. These are listed in the course calendar. Right after prayer on most days (not exam days), there will be a short test (about ten to 15 minutes) based on the assigned readings. It will consist of about 25 questions (but could be more or less).

Chapter tests are labeled in the calendar with ch followed by two or four digits. The first two digits identify the first chapter being tested, and the last two digits identify the last chapter being tested. Thus, ch0203 would cover the questions from chapter 2 through chapter 3.

The chapter tests are mostly about knowing answers to common questions, and involve memorizing facts and terminology.

For each chapter test you have several opportunities. Each test has a day on which it is given in class, right after the opening prayer. On that first day, any score you earn is granted a five percent bonus. And it has the day when the final exam is scheduled. There may be other opportunities, but that is not guaranteed. You can take each test as many times as it is offered. We will keep your highest score.

Typically each test question is worth two "chapter test" points, which, after scaling, is about 1.4 overall points. The total number of chapter test points is about 910, but it could end up being more or less. We will mathematically scale those points to be 620 overall points toward the final grade.

The chapter tests are "closed book," by which I mean that you are not allowed to look up answers while you are taking the test.

Your scores from these Chapter Tests will be recorded in **2161 IT 280 Chapter Grade Book**. The total from this grade book will be rescaled so the full-credit values add up to 620 points.

1.4.6   Three Skills Tests (180 pts)

SN: (60 pts) q25 Skill with Numbers. 40 questions.

SS: (60 pts) q50 Skill with Subnets. 40 questions.

SV: (60 pts) q51 VLSM Subnets. About 10 questions.

These skills-based exams are based on skills taught in the book and in class. Practice tests are available after each test has been introduced, or by request.

Retakes: You can retake skills tests on any retake day, and your highest score will be kept.

1.4.7 Four Labs (160 pts)

L1: (50 pts) Lab 1: Ethernet Cables

L2: (30 pts) Lab 2: Dia Network Diagram

L3: (50 pts) Lab 3: Router Configuration

L4: (30 pts) Lab 4: Password Report

1.4.8 Other Extra Credit

I give extra credit if you are the first to report an error in my formal communications (the published materials I provide), so I can fix it. Send me an email. Cut and paste what I said (enough so I can easily find it). Tell me why you think it is wrong, or what it should be.

In this class, the formal materials include the following:

- The course website, parts relating to this semester.

- The course syllabus.

- The course study guide.

- The course textbook, since I wrote it.

Each error reported can earn you extra credit.

Syllabus errors are normally fixed only in the study guide. Check there before reporting them.

1.5 Communication

We communicate with each other both **formally** and **informally.**

Formal communication is official, carefully worded, and normally in writing. Formal is for anything truly important, like grades.

Informal communication is casual and impromptu. It is meant to be helpful and efficient. Reminders are informal. Explanations are usually informal.

Email can go either way.

If the formal and the informal do not agree with each other, trust the formal but also let me know so I can correct any errors.

1.5.1   From Me to You, Formal

I communicate formally, in writing, through (a) the syllabus, (b) the study guide, and (c) the learning management system.

(a) Syllabus: http://byuh.doncolton.com/it280/2161/syl.pdf is the syllabus for this course. It tells our learning objectives and how you will be graded overall. You can rely on the syllabus. After class begins, it is almost never changed except to fix major errors.

(b) Study Guide: http://byuh.doncolton.com/it280/2161/sguide.pdf is the study guide for this course. It has an index. It includes a copy of the syllabus. The study guide may be updated during the semester, as assignments are made and deadlines are established or updated.

(b1) Calendar: The study guide tells when things will happen. It contains specific due dates.

(b2) Assignments: The study guide tells what assignments have been made and how you will be graded, item by item. It provides current details and specific helps for each assignment. It may provide guidance for taking the exams.

(c) DCQuiz: https://dcquiz.byuh.edu/ is my learning management system. I use it to give tests. I use it to show you my grade books.

1.5.2   From Me to You, Informal

My main informal channels to you are (a) word of mouth and (b) email.

(a) Word of Mouth, including Lecture: Class time is meant to be informative and helpful. But if I say anything truly crucial, I will also put it into the study guide.

(b) Email: My emails to you are meant to be helpful. But if I say anything truly crucial, I will also put it into the study guide. Normally I put IT 280

at the front of the subject line in each email I send.

1.5.3 From You to Me, Email

Rule 1: Send emails to **doncolton2@gmail.com**

Rule 2: Put **it280** in your email subject line.

Sometimes I get buried in email, especially at the end of the semester. I do not want to overlook your email to me, or have it end up caught in my spam filter. And for my own sanity I want to be able to find and deal with all the email related to this class at the same time. This is especially true for large classes.

My solution is to have you put **it280** (exactly, with no spaces in it) in your email subject line, preferably as the first word. If you do this, my email system will immediately and automatically respond to you, telling you that I got your email and it is in my queue.

Exam Question 1 (p.102)**:** When sending Prof Colton email about IT 280, should I put it280 in the subject line?

Required Answer: yes

Exam Question 2 (p.102)**:** When sending Prof Colton email about IT 280, should I put IT 280 in the subject line?

Required Answer: no

If you fail to do this or do it wrong, you will not get an immediate reply and your email will end up in some other queue in my work flow. Your email will not be noticed when I am grading for this class. In the best case I will eventually handle your email. In the worst case your email will be in my spam folder and I will never even see it.

You also should include your roll-book name in the subject line. That is normally your lastname, comma, firstname.

Exam Question 3 (p.102)**:** When sending Prof Colton email about IT 280, should I put my roll-book name in the subject line?

Required Answer: yes

1.5.4   From You to Me, Formal

Your formal channels to me, specifically how you turn in class work, are mainly via (a) the learning management system, (b) email, and (c) specifically requested projects.

(a) DCQuiz: To use my learning management system, you must log into it. Then, you can respond to questions I have posted. Each day there will be a "daily update". I say more on that elsewhere. Tests will also be given using DCQuiz.

(b) Email: You may be asked to use email in a formal way to submit some of the work you create and to tell me certain other things. The study guide tells how to send formal emails, including where to send them, what subject line to use, and what to put in the body of the message.

1.5.5   From You to Me, Informal

Your informal channels to me, typically how you ask questions and get assistance, are mainly face to face and by email or chat.

Face to Face: If you need help with your class work, I am happy to look at it and offer assistance. Often this happens during class, during open labs, or during office hours. Often I will have you put your work on your computer screen, and then I will take a look at it while we talk face to face.

Email / Chat: You can also get assistance by sending me an email or doing a chat. I will do my best to respond to it in a reasonable and helpful way. If you want something formal, use the formal rules.

If you are writing about several different things you will usually get a faster response if you break it up into several smaller emails instead of one big email. I try to respond to a whole email at once, and not just part of it. I usually answer smaller and simpler emails faster than big ones.

1.6   Instructional Methods

Tests (chapter tests and skills tests) happen on most days. They are typically short. Tests are an instructional method that brings you, the student, face to face with information you should know and challenges you should be able to solve.

Lecture happens as a side-effect of the grading of the chapter tests. This happens immediately after the test ends. I openly grade and discuss the answers that were submitted to help you learn.

Some days I may spend the whole class period lecturing about a current topic, and there is no test that day. I review material that was assigned from the text book and do what I can to make it clear and interesting. These can take up most of the class hour, and happen more often at the start of the course than they do later on.

Activity days present a lab situation where we work to create something.

1.6.1 BYUH Learning Framework

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

1.6.2 Prepare for IT 280

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 your and others' understanding of the material.

In IT 280: Do the readings for each chapter before the chapter test. 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 me lecture.

1.6.3 Engage in IT 280

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 encouraged to help those that want assistance. It is amazing what you can learn by trying to help someone else.

1.6.4 Improve at IT 280

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, I usually allow you to see every score and every comment and every answer submitted for every question. To improve your understanding, review your answers and those of other students. See how your answers could be improved. If you feel lost, study the assigned readings again and ask questions.

1.6.5 Support

The major forms of support are (a) open lab, (b) study groups, and (c) tutoring.

If you still need help, please find me, even outside my posted office hours.

1.6.6 Open Lab / Office Hour

As mentioned above, I have reserved GCB 111 on MWF from 14:30 to 15:30 (right after my CIS 101 class) and on TuTh from 15:30 to 17:00 (right after my IT 240 class) so my students (and others) can study in a lab setting and meet with me and each other. I will be there at the start of those hours, and will stay as long as students are asking me questions. I also allow the room as an Open Lab for your use either individually or in groups, for my class or for other classes.

The CIS department operates an open lab with tutors in GCB 111 most afternoons and evenings.

1.6.7 Study Groups

You are encouraged to form a study group. If you are smart, being in a study group will give you the opportunity to assist others. By assisting others you will be exposed to ideas and approaches (and errors) that you might never have considered on your own. You will benefit.

If you are struggling, being in a study group will give you the opportunity to ask questions from someone that remembers what it is like to be totally new

at this subject. They are more likely to understand your questions because they sat through the same classes you did, took the same tests as you did, and probably thought about the same questions that you did.

Most of us are smart some of the time, and struggling some of the time. Study groups are good.

1.6.8   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.

Exam Question 4 (p.102)**:** Does the CIS department provide tutoring for this class?
Required Answer: yes

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

There are networking-savvy student workers in GCB 119. 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.

1.7   Course Policies

Subject to Change: 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 still think it is unfair, you can appeal to the department chair or the dean. Also, you are welcome to suggest ways you think the class could be improved.

Digital Recording by me: I may digitally record the audio of my lectures some days. This is to help me improve my teaching materials.

Digital Recording by you: Almost everyone has a smart phone these days. I assume students will freely record what goes on in class, and take

pictures of what is on the white board to aid in their studies. I simply ask that you not embarrass anyone.

1.7.1 Special Treatment

There are many good reasons why students request special treatment. These include, for example, illness, field trips, performances, athletic events, and special needs. Instead of dealing with these as they arise, based on my past experience, I have adopted general policies that are intended to accommodate all but the most difficult cases, and thereby avoid the need for special treatment.

1.7.2 Reasonable Accommodation

This section covers special needs, including qualified special needs, as well as all other requests for special treatment.

I have carefully designed each of my classes to provide what I believe to be reasonable accommodation to those with special needs. Beyond that, further accommodation is usually considered to be unreasonable but may happen in extreme cases. Please see the paragraph on "Accommodating Special Needs" below for more information.

Ample Time: Specifically, I allow ample time on tests so that a well-prepared student can typically finish each test in half of the time allowed. This gives everyone essentially double the amount of time that should normally be needed.

Exam Retakes: Each exam is given several times and I keep the highest score that was earned. This handles the case of persons that are unable to attend class or function at their best on any given day.

I consider the first attempt to be routine. The first time the exam is given, a bonus of 5% is added to your score. This is to encourage you to prepare well before each exam.

I consider the other opportunities to be an accommodation for anyone that might need it. The scheduled final exam is Wed, Feb 24, 10:00 to 12:50. The final consists of one last opportunity to retake **any** exam that was offered during the semester. If you are happy enough with your previous scores, **you can skip the final.**

As a side effect of this several-tries approach to exams, it is also true that any student can miss any one or two days of class for any reason without messing up their grade.

On the other hand, the retakes are limited. If you have issues every single time the test is given, I do draw the line, and I will not give additional chances. Additional retakes are not considered to be a "reasonable" accommodation. Additional retakes or make-ups are not offered except in highly unusual circumstances.

Extra Credit: I have built some extra credit into the grading so you can miss a few points here or there and make them up elsewhere.

Deadlines: Most labs are due very soon after they are discussed, but I normally allow late work at full credit for another week.

Even though I truly believe that these methods provide reasonable accommodation for almost everyone in almost every case, you might have a highly unusual situation for which I can and should do even more. You are welcome to see me about your situation.

1.8 Learning Outcomes

Outcomes (sometimes called objectives) are stated at several levels: Institutional (ILO), Program (PLO), and Course (CLO). In this section we set forward these outcomes and tell how they are aligned with one another.

1.8.1 ILOs: Institutional Outcomes

ILO: Institutional Learning Outcomes (ILOs) summarize the goals and outcomes for all graduates of BYUH.

Brigham Young University Institutional Learning Objectives (ILOs) Revised 24 February 2014

Graduates of Brigham Young University–Hawaiʻi will:

Knowledge: Have a breadth of knowledge typically gained through general education and religious educations, and will have a depth of knowledge in their particular discipline.

Inquiry: Demonstrate information literacy and critical thinking to understand, use, and evaluate evidence and sources.

Analysis: Use critical thinking to analyze arguments, solve problems, and reason quantitatively.

Communication: Communicate effectively in both written and oral form, with integrity, good logic, and appropriate evidence.

Integrity: Integrate spiritual and secular learning and behave ethically.

Stewardship: Use knowledge, reasoning, and research to take responsibility for and make wise decisions about the use of resources.

Service: Use knowledge, reasoning, and research to solve problems and serve others.

1.8.2 PLOs: Program Outcomes

PLO: Program Learning Outcomes (PLOs) summarize the goals and outcomes for graduates in programs for which this course is a requirement or an elective. These support the ILOs, but are more specific.

At the end of this section, we include the relevant page from the CIS Program Outcomes Matrix, dated April 2011.

The following outcomes are pursued at the levels indicated.

Medium: **Practiced with Feedback**
(a) An ability to apply knowledge of computing and mathematics appropriate to the discipline.

Medium: **Practiced with Feedback**
(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.

Medium: **Practiced with Feedback**
(c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

Medium: **Practiced with Feedback**
(e) An understanding of professional, ethical, legal, security and social issues and responsibilities.

Medium: **Practiced with Feedback**
(f) An ability to communicate effectively with a range of audiences.

Low: **Introduced**
(h) Recognition of the need for and an ability to engage in continuing pro-

fessional development.

Medium: **Practiced with Feedback**
(i) An ability to use current techniques, skills, and tools necessary for computing practice.

Medium: **Practiced with Feedback**
(IT j) An ability to use and apply current technical concepts and practices in the core information technologies.

Low: **Introduced**
(IT k) An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems.

Low: **Introduced**
(IT l) An ability to effectively integrate IT-based solutions into the user environment.

1.8.3   CLOs: Course Outcomes

CLO: Course Learning Outcomes (CLOs, also called Student Learning Outcomes, or SLOs) summarize the goals and outcomes for students who successfully complete this course. These support the PLOs, but are more specific.

Course Goals and Student Learning Outcomes are as follows:

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.

CIS Department Outcomes Matrix, April 2011

Program Outcomes

(a) An ability to apply knowledge of computing and mathematics appropriate to the discipline.

(b) An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution.

(c) An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs.

(d) An ability to function effectively on teams to accomplish a common goal.

(e) An understanding of professional, ethical, legal, security and social issues and responsibilities.

(f) An ability to communicate effectively with a range of audiences.

(g) An ability to analyze the local and global impact of computing on individuals, organizations, and society.

(h) Recognition of the need for and an ability to engage in continuing professional development.

(i) An ability to use current techniques, skills, and tools necessary for computing practice.

CS Only

(j) An ability to apply mathematical foundations, algorithmic principles, and computer science theory in the modeling and design of computer-based systems in a way that demonstrates comprehension of the tradeoffs involved in design choices. [CS]

(k) An ability to apply design and development principles in the construction of software systems of varying complexity. [CS]

IS Only

(j) An understanding of processes that support the delivery and management of information systems within a specific application environment. [IS]

IT Only

(j) An ability to use and apply current technical concepts and practices in the core information technologies. [IT]

(k) An ability to identify and analyze user needs and take them into account in the selection, creation, evaluation and administration of computer-based systems. [IT]

(l) An ability to effectively integrate IT-based solutions into the user environment. [IT]

(m) An understanding of best practices and standards and their application. [IT]

(n) An ability to assist in the creation of an effective project plan. [IT]

R = Required in that program | **CSS** = CS B.S. | **CIS** = CIS B.S. | **IS** = IS B.S. | **IT** = IT B.S.

= choose at least 9 cr hrs | O = optional as a substitute | L = Introduced, M = Practiced with feedback, H = Demonstrated at the Mastery level

Course	Description	CSS	CIS	IS	IT	a	b	c	d	e	f	g	h	i	CSj	CSk	ISj	ITj	ITk	ITl	ITm	ITn
CIS 100	Fundamentals of Info. Systems & Tech.			R	R	L	L	L	L	L	L	L	L	L			L	L	L			
CIS 101	Beginning Programming	R	R	R	R	L	L								L	L	L					
CIS 202	Object-Oriented Programming	R	R	R	R	M	M	M		L			L	M	L	L		M	L		L	L
CIS 205	Discrete Mathematics I	R	R	R	R	M	M	L	L				M	M	M	M						
CIS 206	Discrete Mathematics II	R	R	R		M	M	L	L				M	M	M	M						
CIS 305	Systems Engineering I	R	R	R	R	M	M	M	M	L	L	M	L	M	L	L	M	L	H	L	H	M
CIS 401	Web Application Development	R		R	R	M	L	L						M			L	M	L	L		
CIS 405	Systems Engineering II	R	R	R	R	M	M	M	M	L	M	M	M	M	M	M	M	M	H	M	H	M
CIS 470	Ethics in Computer & Info. Sciences	R	R	R	R		L	L	M	H	H	H	H									
CS 203	Object-Oriented Programming II	R				M	M	M					M	M	M	M						
CS 210	Computer Organization	R			R	H	M	L						M	L			M				
CS 301	Algorithms & Complexity	R				L	M	L	L		M		L	M	H							
CS 320	Computational Theory	R				H	M			L		L	M		H	M						
CS 415	Operating Systems Design	R				H	H	H		M	M	M	H	H	H	H					M	
CS 420	Programming Languages	R				H	H	H		M	M	M	H	H	H	H						
CS 490R	Adv Topics in Computer Science (6 CR)	R				H	H	H					H		H	H						
IS 330	Management Information Systems					L	L		M	L	M	L	L	L			L					
IS 350	Database Management Systems	R	R	R	R	M	L	M	M	L	L	L	L	M	M	L	L	H	L			
IS 430	ITS – Enterprise Resource Planning			R			L	M	M	M	M	M	M	H			H		L		M	
IS 435	Advanced Concepts ERP Systems					H	H		H	L	M	M	M	H			H			L	H	
IS 485	Project Management & Practice			R		M	H	M	H	M	H	M	H	M	M	H	H	M				H
IT 220	Linux Essentials				R	M							M					M				
IT 224	Computer Hardware & Systems Software			R	R	M	H	L	M	L	M	L	L	L				M	M	L	L	
IT 240	Fund. Of Web Design & Technology			R	R	L	L	L		M	H	M	M				L	L	M	M	M	L
IT 280	Data Comm. Systems & Networks	R	R	R	R	M	M	M		M	M		L	M				M	L	L		
IT 420	Linux System Administration				R	H	H	M						H				M	M	M		
IT 426	Computer Network Services				R	H	H	M	L	L	L	L	L	M				H	M	M	M	L
IT 440	Foundations of HCI				R	M	H	H	M	H	M	H	M	M			H	M	H	H	H	M
IT 480	Computer Network Design				R	H	H	H					L, M	H				M	M	M		M
IT 481	Information Assurance & Security				R		L	L		L	L	L	L	M				M	M	L	M	L
Math 112	Calculus I	O		R	#																	
Math 113	Calculus II	O			#																	
Math 119	Applied Calculus	R	O	O	#																	
Math 214	Mulitvariable Calculus				#																	

1.9   General University Policies

1.9.1   Academic Integrity

Brigham Young University–Hawai'i is committed to upholding a policy of academic integrity among administrators, faculty, staff, and students. Basically we are talking about cheating here. We tell you what is acceptable and what is not.

Plagiarism

We learn by watching others and then doing something similar.

Plagiarism: Sometimes it is said that plagiarism is copying from one person, and research is "copying" from lots of people.

When you are having trouble with an assignment, I encourage you to look at not just one, but many examples of work done by others. Study the examples. See what you can learn from them. Do not automatically trust that they are right. They may be wrong.

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.

Specific Rules For IT 280

Tests: 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. This rule goes for all chapter tests and skills tests.

Exam Question 5 (p.102): Can I bring blank paper into a test?
Required Answer: yes

Exam Question 6 (p.102): Can I bring notes into a test?
Required Answer: no

Exam Question 7 (p.102): During tests can I make written notes?
Required Answer: yes

Exam Question 8 (p.102): During tests can I use email?
Required Answer: no

Exam Question 9 (p.102): During tests can I communicate with others?
Required Answer: no

Exam Question 10 (p.102): During tests can I use my cell phone?
Required Answer: no

Exam Question 11 (p.102): During tests can I use my laptop computer?
Required Answer: no

Exam Question 12 (p.103): During tests can I use Google?

Required Answer: no

Exam Question 13 (p.103)**:** During tests can I use a language dictionary?
Required Answer: no

Exam Question 14 (p.103)**:** During tests can I use a calculator?
Required Answer: no

Applicable Actions

http://honorcode.byuh.edu/ details the university honor code. In the section entitled "Applicable Actions" the following are listed.

Examples of possible actions include but are not limited to the following, for instructors, programs, departments, and colleges:
• Reprimanding the student orally or in writing.
• Requiring work affected by the academic dishonesty to be redone.
• Administering a lower or failing grade on the affected assignment, test, or course.
• Removing the student from the course.
• Recommending probation, suspension, or dismissal.

Exam Question 15 (p.103)**:** Could cheating result in a zero on the assignment?

Required Answer: yes

Exam Question 16 (p.103)**:** Could cheating result in an F in the course?
Required Answer: yes

Depending on the specifics of the offense, any of these responses may be possible.

Cheating on exams is the most common form of dishonesty that I normally encounter. Normally this happens when students bring in notes that include answers to past exam questions. I approve the studying of past exams, and bringing in of "memories" based on study, but not the access to written notes, including notes retrieved from other exams or stored on cell phones or other devices. Any such activity can result in failure of the entire course.

Most of the cheating that is discovered is because the exact same mistakes were made by two or more people.

1.9.2 Unlawful Discrimination

Brigham Young University–Hawai'i is committed to a policy of nondiscrimination on the basis of race, color, sex (including pregnancy), religion, national origin, ancestry, age, disability, genetic information, or veteran status in admissions, employment, or in any of its educational programs or activities.

1.9.3 Title IX and Sexual Misconduct

Brigham Young University–Hawai'i is committed to promoting and maintaining a safe and respectful environment for the campus community. In the USA, Title IX (Title 9) of the Education Amendments of 1972 prohibits all sexual misconduct against any participant in an educational program or activity.

Sexual Misconduct includes:

Sexual Harassment, which is unwelcome speech or conduct of a sexual nature. It includes unwelcome sexual advances, requests for sexual advances, requests for sexual favors, and other verbal, non-verbal, or physical conduct that is not requested or invited.

Stalking, which is repeatedly following, monitoring, harassing, threatening or intimidating another by phone, mail, electronic communication or social media without legitimate purpose.

Domestic and Dating Violence, which is a pattern of abusive behavior in any relationship that is used by one partner to control another partner. This includes behaviors that intimidate, manipulate, humiliate, isolate, frighten, terrorize, coerce, threaten, blame, hurt, injure, or wound.

Sexual Violence / Assault, which is actual or attempted sexual contact with another person without that person's consent.

Consent cannot be obtained when someone is a minor, under the influence of drugs or alcohol, or has certain disabilities. In the absence of an outward demonstration, consent does not exist. If at any time it is reasonably apparent that either party is hesitant, confused, or uncertain, both parties should stop.

The following individual has been designated to handle reports of sexual harassment and other inquiries regarding BYUH compliance with Title IX:

```
Debbie Hippolite-Wright, PhD
Title IX Coordinator
Vice President, Student Development & Life
Lorenzo Snow Administration Building
55-220 Kulanui Street
Laie, Hawaii 96762
Office Phone: 808-675-4819
E-Mail: titleix@byuh.edu
Sexual Harassment Hotline: 808-780-8875
```

BYUH's Office of Honor upholds a standard which states that parties can only engage in sexual activity freely within the legal bonds of marriage between a man and a woman. Consensual sexual activity outside the bonds of marriage is against the Honor Code and may result in probation, suspension, or dismissal from the University.

1.9.4 Services for Students with Special Needs

Brigham Young University–Hawai'i is committed to providing a working and learning atmosphere, which reasonably accommodates qualified persons with disabilities. If you have a disability and need accommodations, you may wish to self-identify by contacting:

```
Services for Students with Special Needs
McKay 181
Phone: 808-675-3518 or 808-675-3999
Email address: aunal@byuh.edu
```

The Coordinator for Students with Special Needs is Leilani A'una.

Students with disabilities who are registered with the Special Needs Services should schedule an appointment with the instructor to discuss accommodations. If the student does not initiate this meeting, it is assumed no accommodations or modifications will be necessary to meet the requirements of this course. After registering with Services for Students with Special Needs, and with permission of the student, Letters of Accommodation will be sent to instructors.

Exam Question 17 (p.103)**:** Can students with special needs get special accommodations?

Required Answer: yes

1.10 Syllabus Summary

Brigham Young University–Hawai'i has adopted certain requirements relating to the information that must be provided in syllabi. This section lists those requirements and for each item either provides the information directly or gives a link to where it is provided above.

Course Information: See section 1.2.1 (page 8).

- **Title:** Computer Networking
- **Number:** IT 280
- **Semester/Year:** Winter 2015-16
- **Credits:** 3
- **Prerequisites:** none
- **Location:** GCB 111
- **Meeting Time:** MWF 11:00 to 12:00

Faculty Information: See section 1.2.2 (page 8).

- **Name:** Don Colton
- **Office Location:** GCB 128
- **Office Hours:** (In GCB 111) MWF 14:30-15:00, TuTh 15:30-16:00.
- **Telephone:** 808-675-3478
- **Email:** doncolton2@gmail.com

Course Readings/Materials: See section 1.2.3 (page 9) for a list of textbooks, supplementary readings, and supplies required.

Course Description: See section 1.2.1 (page 8).

Expected Proficiencies:
See section 1.1.1 (page 7) for the proficiencies you should have before undertaking the course.

Course Goals and Student Learning Outcomes, including Alignment to Program (PLOs) and Institutional (ILOs) Learning Outcomes, and extent of coverage.

See section 1.8 (page 22) for learning outcomes, showing the content of the course and how it fits into the broader curriculum. A listing of the departmental learning outcomes is provided together with the ratings taken from department's matrix assessment document representing the degree to which the course addresses each outcome.

Instructional Methods: See section 1.6 (page 17).

Learning Management System:
https://dcquiz.byuh.edu/ is the learning management system for my courses.

Framework for Student Learning:
See section 1.6.1 (page 18) for a discussion of the student learning framework and how I use it.

Course Calendar: See section 1.3 (page 9) for the calendar in general.

Here are some items of particular interest:

- **First Day of Instruction:** Mon, Nov 09
- **Last Day to Drop:** Fri, Dec 11
- **Last Day to Withdraw:** Wed, Jan 20
- **Last Day of Instruction:** Mon, Feb 22
- **Final Exam:** Wed, Feb 24, 10:00 to 12:50
- **Final Exam Location:** GCB 111

Course Policies: See section 1.7 (page 20).

- **Attendance:** See section 1.4.2 (page 11).
- **Tardiness:** See section 1.4.2 (page 12).
- **Class Participation:** See section 1.6.3 (page 18).
- **Make-Up Exams:** See section 1.7.2 (page 21).
- **Plagiarism:** See section 1.9.1 (page 27).
- **Academic Integrity:** See section 1.9.1 (page 27).

Evaluation (Grading): See section 1.4 (page 10).

Academic Honesty: See section 1.9.1 (page 27).

Unlawful Discrimination: See section 1.9.2 (page 30).

Title IX and Sexual Misconduct: See section 1.9.3 (page 30).

Grievances: The university grievance policy states that the policies listed on the syllabus can act as a contract and will be considered if a student has a complaint about the instructor or the course.

Services for Students with Special Needs: See section 1.9.4 (page 31).

Chapter 2

Calendar and Activities

The syllabus lists a calendar of planned activities. This chapter repeats, amplifies, and corrects that list. For future class periods it shows my best guess about what will happen. For past class periods it shows my best recollection of what actually happened. It will be updated from time to time as the semester continues.

Contents

2.1 Mon, Nov 09

- Exams: none
- First Day of Instruction
- Assignment: send email to `doncolton2@gmail.com`
- Review some webpages of interest to this course.
  - ○ <http://doncolton.com/> is my off-campus homepage
  - ○ <http://byuh.doncolton.com/> is my on-campus homepage
  - ○ <http://byuh.doncolton.com/it280/> is this course homepage
  - ○ <http://byuh.doncolton.com/it280/2161/syl.pdf> is the syllabus
  - ○ <http://byuh.doncolton.com/it280/2161/sguide.pdf> is this study guide
- Daily Update d01
  - ○ <http://dcquiz.byuh.edu/> is where you take the daily update.

2.1.1 Email Task

- Introduced: Mon, Nov 09
- 2pt Due Date: Wed, Nov 11, 23:59.
- 1pt Due Date: Wed, Nov 18, 23:59.

We normally do this in class the first day. It is worth two attendance points.

Your task is fairly simple: send me an email. If you do it correctly, you should receive and immediate response.

To: Send it to `doncolton2@gmail.com`

Subject: Start the subject line with it280 and continue with your lastname, comma, your firstname.

Good example: it280 Colton, Don

Bad example: it280ColtonDon

Bad example: it280_Colton_Don

Body: The body of your email should cover these things:

Name: What name would you like me to use when I call upon you in class? If your lastname is unusual, specify that too.

Prayers: Are you willing to say the opening prayer in class if I call on you? Most people say yes. Some people say no. It is okay either way. Let me know.

Immediate Response: After you send your email, you should receive an

immediate response from my email system. The response will say something like this:

This is an instant reply to let you know that I received your email relating to IT 280 (Computer Networking), and it has been placed into my pending file for review and/or grading as soon as I can get to it. You can expect another reply from me when I have looked at your email. Thanks! Bro Colton

The exact wording may vary, but that's the general idea.

If you do not receive an immediate response, here are some problems you can look for:

(a) Did you send it to the correct email address?

(b) Did you do the subject line properly? Make sure the spacing is right.

(c) Are you online? Sometimes people send from a mobile device like a cell phone or a tablet which may not be constantly connected with the Internet. The device may hold your mail until it can connect, and then send it.

(d) Is the network having problems? Sometimes (rarely) the network is down. Can you visit webpages? Can you send and receive email besides this one?

2.2   Wed, Nov 11

- Exams: none
- 10:55-11:05 Daily Update d02
- 11:05-11:25 20m ch01 practice test (not for credit)
- Talk about how the Internet came to be.
- Review the grade books
- Policy Test practice

We will run through the ch01 test and the policy test to show you how these tests are to be taken, and as a basis for discussion.

2.3   Fri, Nov 13

- Exams: ch01*, policy test
- Have read textbook chapter 1 before class.
- 10:55-11:05 Daily Update d03
- 11:05-11:15 10m ch01* test with bonus points
- 11:15-11:30 15m ch01 grading and discussion
- 11:30-11:33 Policy Test
- 11:30-12:00 30m L1: intro (d05)

See chapter 7 (page 82) for more about the L1 lab.

2.4   Mon, Nov 16

- Exams: ch0203*, ch01r
- Have read textbook chapters 1 through 3 before class.
- 10:55-11:05 Daily Update d04
- 11:05-11:15 10m ch0203* test with bonus points
- 11:15-11:25 10m ch0203 grading and discussion
- 11:25-11:50 25m L1: prac (test will be Wed, Nov 18)
- 11:50-12:00 10m ch01r retake

See chapter 7 (page 82) for more about the L1 lab.

2.5 Wed, Nov 18

- Exams: L1
- Have read textbook chapters 1 through 3 before class.
- 10:55-11:05 Daily Update d05
- 11:05-12:00 55m L1: all hour

See chapter 7 (page 82) for more about the L1 lab.

2.6   Fri, Nov 20

- Exams: ch0405*, ch0203r, policy test
- Have read textbook chapters 1 through 5 before class.
- 10:55-11:05 Daily Update d06
- 11:05-11:15 10m ch0405* test with bonus points
- 11:15-11:25 10m ch0405 grading and discussion
- 11:25-11:50 25m ch06 preview (d07)
- 11:50-12:00 10m ch0203r retake
- 11:55-12:00 5m Policy Test

2.7   Mon, Nov 23

- Exams: ch06*, ch0405r
- Have read textbook chapters 1 through 6 before class.
- 10:55-11:05 Daily Update d07
- 11:05-11:25 20m ch06* test with bonus points
- 11:25-11:50 25m ch06 grading and discussion
- 11:50-12:00 10m ch0405r retake
- L1 due date (d05)

See chapter 7 (page 82) for more about the L1 lab.

2.8   Wed, Nov 25

- Exams: ch06r
- Have read textbook chapters 1 through 6 before class.
- 10:55-11:05 Daily Update d08
- 11:05-11:40 35m SN prac (test will be Wed, Dec 09)
- 11:40-12:00 20m ch06r retake

See chapter 4 (page 77) for more about the SN test.

2.9 Mon, Nov 30

- Exams: policy
- Have read textbook chapters 1 through 6 before class.
- 10:55-11:05 Daily Update d09
- 11:05-11:55 50m L2: Dia Network Diagram activity
- L2 30pt due date is Fri, Dec 04
- 11:55-12:00 5m Policy Test

See chapter 8 (page 83) for more about the L2 lab.

2.10   Wed, Dec 02

- Exams: ch0911*
- Have read textbook chapters 1 through 11 before class.
- 10:55-11:05 Daily Update d10
- 11:05-11:20 15m ch0911* test with bonus points
- 11:20-11:35 15m ch0911 grading and discussion
- 11:35-12:00 25m SN: prac (test will be Wed, Dec 09)
- L2 30pt due date is Fri, Dec 04

See chapter 4 (page 77) for more about the SN test.

See chapter 8 (page 83) for more about the L2 lab.

2.11   Fri, Dec 04

- Exams: ch0911r
- Have read textbook chapters 1 through 11 before class.
- 10:55-11:05 Daily Update d11
- 11:05-11:45 40m SN: prac (test will be Wed, Dec 09)
- 11:45-12:00 15m ch0911r retake
- L2 30pt due date is 23:59 today.
- L2 20pt due date is Fri, Dec 11

See chapter 4 (page 77) for more about the SN test.

See chapter 8 (page 83) for more about the L2 lab.

2.12   Mon, Dec 07

- Exams: ch12*
- Have read textbook chapters 1 through 12 before class.
- 10:55-11:05 Daily Update d12
- 11:05-11:16 11m ch12* test with bonus points
- 11:16-11:30 14m ch12 grading and discussion
- 11:30-12:00 30m SN: prac (test will be Wed, Dec 09)
- 14:30-14:40 10m Policy Test retake (lab time)
- L2 20pt due date is Fri, Dec 11

See chapter 4 (page 77) for more about the SN test.

See chapter 8 (page 83) for more about the L2 lab.

2.13   Wed, Dec 09

- Exams: SN
- Have read textbook chapters 1 through 12 before class.
- 10:55-11:05 Daily Update d13
- 11:05-12:00 55m SN: all hour (ch8,26)
- 14:30-14:40 10m Policy Test retake (lab time)
- L2 20pt due date is Fri, Dec 11

See chapter 4 (page 77) for more about the SN test.

See chapter 8 (page 83) for more about the L2 lab.

2.14   Fri, Dec 11

- Exams: ch13*, ch12r, policy test
- Have read textbook chapters 1 through 13 before class.
- 10:55-11:05 Daily Update d14
- 11:05-11:20 15m ch13* test with bonus points
- 11:20-11:45 25m ch13 grading and discussion
- 11:45-12:00 11+m ch12r retake
- 11:55-12:00 5m Policy Test
- 14:30-14:40 10m Policy Test retake (lab time)
- L2 20pt due date is Fri, Dec 11

See chapter 8 (page 83) for more about the L2 lab.

2.15   Mon, Dec 14

- Exams: ch13r
- Have read textbook chapters 1 through 13 before class.
- 10:55-11:05 Daily Update d15
- 11:05-11:45 40m L3: prep (test will be Fri, Dec 18)
  ○ Parts, Power, Reset, Rewire, Login
- 11:45-12:00 15m ch13r retake

See chapter 9 (page 86) for more about the L3 lab.

2.16   Wed, Dec 16

- Exams: ch1418*
- Have read textbook chapters 1 through 18 before class.
- 10:55-11:05 Daily Update d16
- 11:05-11:15 10m ch1418* test with bonus points
- 11:15-11:20 5m ch1418 grading and discussion
- 11:20-12:00 40m L3: prep (test will be Fri, Dec 18)
  - Clone, Visit, Passwords, LAN, DHCP

See chapter 9 (page 86) for more about the L3 lab.

2.17 Fri, Dec 18

- Exams: L3
- Have read textbook chapters 1 through 18 before class.
- 10:55-11:05 Daily Update d17
- 11:05-12:00 55m L3: first attempt all hour

See chapter 9 (page 86) for more about the L3 lab.

2.18 Mon, Jan 04

- Exams: ch1920*, ch1418r
- Have read textbook chapters 1 through 20 before class.
- 10:55-11:05 Daily Update d18
- 11:05-11:20 15m ch1920* test with bonus points
- 11:20-11:45 25m ch1920 grading and discussion
- 11:45-12:00 15m ch1418r retake

2.19 Wed, Jan 06

- Exams: none
- Have read textbook chapters 1 through 20 before class.
- 10:55-11:05 Daily Update d19
- 11:05-12:00 55m SS and SV prac (test will be Wed, Jan 13)

See chapter 5 (page 79) for more about the SS test.

See chapter 6 (page 80) for more about the SV test.

2.20   Fri, Jan 08

- Exams: ch2123*, Exams: ch1920r
- Have read textbook chapters 1 through 23 before class.
- 10:55-11:05 Daily Update d20
- 11:05-11:20 15m ch2123* test with bonus points
- 11:20-11:35 15m (est) ch2123 grading and discussion
- 11:35-11:45 10m SS and SV prac (test will be Wed, Jan 13)
- 11:45-12:00 15m ch1920r retake

See chapter 5 (page 79) for more about the SS test.

See chapter 6 (page 80) for more about the SV test.

2.21   Mon, Jan 11

- Exams: ch2123r
- Have read textbook chapters 1 through 23 before class.
- 10:55-11:05 Daily Update d21
- 11:05-11:45 40m SV prac (test will be Wed, Jan 13)
- 11:45-12:00 15m ch2123r retake

Today we will focus on the SV test.

See chapter 5 (page 79) for more about the SS test.

See chapter 6 (page 80) for more about the SV test.

2.22   Wed, Jan 13

- Exams: SS and SV
- Have read textbook chapters 1 through 23 before class.
- 10:55-11:05 Daily Update d22
- 11:05-12:00 55m SS and SV all hour (ch27-29)

See chapter 5 (page 79) for more about the SS test.

See chapter 6 (page 80) for more about the SV test.

2.23 Fri, Jan 15

- Exams: ch2425*
- Have read textbook chapters 1 through 25 before class.
- 10:55-11:05 Daily Update d23
- 11:05-11:26 21m ch2425* test with bonus points
- 11:26-11:40 14m ch2425 grading and discussion
- 11:40-12:00 20m SS and SV review (next exam is Fri, Feb 05)

See chapter 5 (page 79) for more about the SS test.

See chapter 6 (page 80) for more about the SV test.

2.24   Wed, Jan 20

- Exams: ch2425r
- Have read textbook chapters 1 through 25 before class.
- 10:55-11:05 Daily Update d24
- 11:05-11:35 30m SS and SV review (next exam is Fri, Feb 05)
- 11:35-12:00 25m ch2425r retake

See chapter 5 (page 79) for more about the SS test.

See chapter 6 (page 80) for more about the SV test.

2.25   Fri, Jan 22

- Exams: ch26*
- Have read textbook chapters 1 through 26 before class.
- 10:55-11:05 Daily Update d25
- 11:05-11:15 10m ch26* test with bonus points
- 11:15-11:20 5m ch26 grading and discussion
- 11:20-12:00 40m L3: assisted retry (next exam is Mon, Jan 25)

See chapter 9 (page 86) for more about the L3 lab.

The students who previously completed this lab will be invited to "certify" as people that can sign off other students completing the lab. This will speed up the sign-off process and will give the first students something very valuable to do.

2.26   Mon, Jan 25

- Exams: L3
- Have read textbook chapters 1 through 26 before class.
- 10:55-11:05 Daily Update d26
- 11:05-12:00 55m L3: second attempt all hour

See chapter 9 (page 86) for more about the L3 lab.

2.27 Wed, Jan 27

- Exams: ch27*, ch26r
- Have read textbook chapters 1 through 27 before class.
- 10:55-11:05 Daily Update d27
- 11:05-11:23 18m ch27* test with bonus points
- 11:25-11:45 20m ch27 grading and discussion
- 11:45-12:00 15m ch26r retake

2.28   Fri, Jan 29

- Exams: ch27r
- Have read textbook chapters 1 through 27 before class.
- 10:55-11:05 Daily Update d28
- 11:05-11:42 37m L4: Passwords term paper intro
- 11:42-12:00 18m ch27r retake
- L4 30pt due date is Mon, Feb 08

See chapter 10 (page 92) for more about the L4 term paper.

2.29 Mon, Feb 01

- Exams: ch2830*
- Have read textbook chapters 1 through 30 before class.
- 10:55-11:05 Daily Update d29
- 11:05-11:11 6m ch2830* test with bonus points
- 11:11-11:20 9m ch2830 grading and discussion
- 11:20-12:00 40m SS and SV prac (test will be Fri, Feb 05)
- L4 30pt due date is Mon, Feb 08

See chapter 5 (page 79) for more about the SS test.

See chapter 6 (page 80) for more about the SV test.

See chapter 10 (page 92) for more about the L4 term paper.

2.30 Wed, Feb 03

- Exams: ch31*, ch2830r
- Have read textbook chapters 1 through 31 before class.
- 10:55-11:05 Daily Update d30
- 11:05-11:20 15m ch31* test with bonus points
- 11:20-11:30 10m ch31 grading and discussion
- 11:30-11:50 20m SS and SV prac (test will be Fri, Feb 05)
- 11:50-12:00 10m ch2830r retake
- L4 30pt due date is Mon, Feb 08

See chapter 5 (page 79) for more about the SS test.

See chapter 6 (page 80) for more about the SV test.

See chapter 10 (page 92) for more about the L4 term paper.

2.31   Fri, Feb 05

- Exams: SS and SV
- Have read textbook chapters 1 through 31 before class.
- 10:55-11:05 Daily Update d31
- 11:05-12:00 55m SS and SV all hour (ch27-29)
- L4 30pt due date is Mon, Feb 08

See chapter 5 (page 79) for more about the SS test.

See chapter 6 (page 80) for more about the SV test.

See chapter 10 (page 92) for more about the L4 term paper.

2.32 Mon, Feb 08

- Exams: ch31r
- Have read textbook chapters 1 through 31 before class.
- 10:55-11:05 Daily Update d32
- 11:05-11:45 40m tba
- 11:45-12:00 15m ch31r retake
- L4 30pt due date is 23:59 today
- L4 20pt due date is Wed, Feb 17

See chapter 10 (page 92) for more about the L4 term paper.

2.33 Wed, Feb 10

- Exams: ch3233*
- Have read textbook chapters 1 through 33 before class.
- 10:55-11:05 Daily Update d33
- 11:05-11:20 15m ch3233* test with bonus points
- 11:20-11:25 5m ch3233 grading and discussion
- 11:25-12:00 35m tba
- L4 20pt due date is Wed, Feb 17

See chapter 10 (page 92) for more about the L4 term paper.

2.34   Fri, Feb 12

- Exams: ch3233r
- Have read textbook chapters 1 through 33 before class.
- 10:55-11:05 Daily Update d34
- 11:05-11:45 40m L3: assisted retry (next exam is Wed, Feb 17)
- 11:45-12:00 15m ch3233r retake
- L4 20pt due date is Wed, Feb 17

See chapter 9 (page 86) for more about the L3 lab.

See chapter 10 (page 92) for more about the L4 term paper.

2.35 Wed, Feb 17

- Exams: L3
- Have read textbook chapters 1 through 33 before class.
- 10:55-11:05 Daily Update d35
- 11:05-12:00 55m L3: final attempt all hour
- L4 20pt due date is 23:59 today.

See chapter 9 (page 86) for more about the L3 lab.

See chapter 10 (page 92) for more about the L4 term paper.

2.36   Fri, Feb 19

- Exams: none
- Have read textbook chapters 1 through 33 before class.
- 10:55-11:05 Daily Update d36
- 11:05-12:00 55m Wireshark

2.37 Mon, Feb 22

- Exams: none
- Have read textbook chapters 1 through 33 before class.
- 10:55-11:05 Daily Update d37
- 11:05-12:00 55m Wireshark

2.38   Wed, Feb 24

- Exams: any
- 10:55-11:05 Daily Update d38
- 10:00 to 12:50 instead of the normal time.
- Final exam day: Retake any test

Chapter 3

Task ch01, etc.
Chapter Tests

These tests cover the readings in the text book. They are mostly about knowing answers to common questions, and involve memorizing facts and terminology.

In most cases, each question on the chapter tests is worth two points. This makes it easier for me to give partial credit for answers that are close but not close enough. The grand total of all points on the chapter tests is about 910. However, the chapter tests count for only 620 points out of 1000 on your semester grade. We convert between chapter test points and semester points by dividing by 910 and then multiplying by 620. Each chapter test point is worth about 0.7 semester points.

The dates for each test are given in the syllabus.

In most cases, each chapter test is given at the start of a particular class period, and it is given again as a retake at the end of the following class period.

Chapter 4

Task SN
Skill with Numbers

This exam contains 40 questions and normally takes about 30 minutes to complete. You may be able to take it several times. We will keep your highest score.

The dates for each test are given in the syllabus.

Networking uses several different number bases, with the most important one being binary.

There is a practice test. The official exam consists of 40 questions. The practice test has more questions. As you answer each question, it will tell you whether you got the answer right or not, and will let you try again until you do get it right.

To study for this test, use the Networking 101 textbook. The training for this is currently in Chapter 8, Converting Between Bases, that starts on about page 50.

Future changes to the textbook may cause this to move, but if so you can look in the textbook index for "convert". You will find the following entries:

- convert binary to decimal
- convert binary to hex
- convert binary to octal
- convert decimal to binary
- convert hex to binary

- convert octal to binary

20 Easier Questions

There are 5 questions that ask you to convert a number from binary into base 8 (octal).

There are 5 questions that ask you to convert a number from base 8 (octal) into binary.

There are 5 questions that ask you to convert a number from binary into base 16 (hexadecimal, or hex).

There are 5 questions that ask you to convert a number from base 16 (hex) into binary.

20 Harder Questions

There are 10 questions that ask you to convert a number from binary into base 10 (decimal).

There are 10 questions that ask you to convert a number from base 10 (decimal) into binary.

Chapter 5

Task SS
Skill with Subnets

In the textbook (Networking 101), chapter 28 (IPv4 Addresses: Classless) explains the material that is on this test.

This exam contains 40 questions and normally takes about 20 minutes to complete. You may be able to take it several times. We will keep your highest score.

The dates for each test are given in the syllabus.

Networking uses IP addresses. The currently prevailing scheme is called IPv4, and divides the IP address into two parts: the network address and the host address. Subnetting divides the IP address into three parts: the network, the subnet, and the host.

There is a practice test. The official exam consists of 40 questions. The practice test has more questions. As you answer each question, it will tell you whether you got the answer right or not, and will let you try again until you do get it right.

Chapter 6

Task SV
Skill with VLSM

In the textbook (Networking 101), chapter 29 (VLSM) explains the material that is on this test.

This exam contains about 10 questions and normally takes about 10 minutes to complete. Two or more versions are offered so if you fail one you can try again immediately. You may be able to take it on several different days.

The dates for each test are given in the syllabus.

For this test, to get credit you must get a perfect score. That is because the questions are closely related to one another, and your answer on each question will affect the overall correctness of your proposed solution.

There are several practice tests so you can try again and again until you get it perfect.

IPv4 addresses are a scarce commodity. Subnets are a method to get the most value out of the IPv4 addresses that are available.

Each subnet contains a number of addresses, and that number is a power of two. The powers of two are: 1, 2, 4, 8, 16, 32, 64, 128, 256, and so on.

The subnets must be packed together carefully. Specifically, they must start on a boundary that is a multiple of their own size. For example, a 32-address subnet must start of a boundary that is a multiple of 32. And they must not overlap with each other. This is best achieved by placing the largest subnets first and the smaller ones later.

You will be given a set of networks and a space into which they must be packed. For each network, you will be told how many hosts are in the network. You must decide how big the network must be to fit that many hosts. To do this, you add two and round up to a power of two. Then you must place the network into the space provided so that nothing overlaps.

This test says it is worth 50 points, but it may be scaled to some other value in your final grade. To earn those points, you must provide a correct solution to the complete problem. This is an all-or-nothing situation. If you make any errors you will not get credit, but you will be able to try again up until the end of the final. There may be a limit to how many times you can try this test per day.

Chapter 7

Task L1
Ethernet Cable

- Status: Officially Assigned.
- Discussed: Fri, Nov 13
- 50pt Deadline: Mon, Nov 23, 15:30.
- 40pt Deadline: Mon, Nov 30, 15:30.
- Grading Label: **L1**

Summary: Construct a working and beautiful cat5 cable.

Deadlines: If you complete this task by the 50pt deadline, you will receive 50 points toward your final grade. If not, but you complete it by the 40pt deadline, you will receive 40 points toward your final grade. If not, you receive no points.

Chapter 15 of the textbook provides background.

Beautiful means that the cable ends are neat. Specifically, the wire extends about 1/2 inch beyond the sheath, and is completely within the ice cube.

I will provide 8P8C (RJ45) ice cubes, cable, a cutter-crimper, and a cable tester. Most people complete the task in class within an hour, but some do not. You are allowed to borrow the equipment, take it home, and return it later.

Chapter 8

Task L2
Dia - Network Diagramming

- Status: Officially Assigned.
- Discussed: Mon, Nov 30
- 30pt Deadline: Fri, Dec 04, 23:59.
- 20pt Deadline: Fri, Dec 11, 23:59.
- Grading Label: **L2**

Submit By Email: This task must be submitted to me by email. The email subject line must be:

`it280 L2 lastname, firstname`

Purpose: To give you a way to create a network diagram.

Summary: Using the network described below, construct a one-page diagram. Email a PDF of your diagram to me.

Deadlines: If you complete this task by the 30pt deadline (Fri, Dec 04), you will receive 30 points toward your final grade. If not, but you complete it by the 20pt deadline (Fri, Dec 11), you will receive 20 points toward your final grade. If not, you receive no points.

```
You are supporting 4 routers and 6 work groups.
Router r1 connects to: r2 r4.
Router r2 connects to: r1.
Router r3 connects to: r4.
```

```
Router r4 connects to: r1 r3.
Work group Beijing has 15 users and connects to router r4.
Work group Frankfurt has 16 users and connects to router r4.
Work group Jakarta has 3 users and connects to router r2.
Work group Shanghai has 35 users and connects to router r1.
Work group Wellington has 15 users and connects to router r4.
Work group Yokohama has 15 users and connects to router r2.
```

We will use the Dia Diagram Editor. It is similar to Microsoft Visio. Dia is available free for Mac, Windows, and Linux (including Ubuntu).

Google search "dia diagram editor tutorial" for instructions, or watch and learn in class.

General Requirements:
- email subject line must be: `it280 L2 lastname, firstname`
- diagram must include it280
- diagram must include L2
- diagram must include your roll-book name (Lastname and Firstname)
- diagram must include today's date
- diagram must use the proper symbols

Use this symbol for each router. You can find it on the "Cisco - Switch" symbol sheet. Put a text label on each router that tells its designated name.
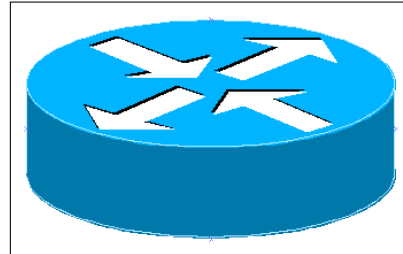
Use this symbol for each switch. (Put a switch between each router and its workgroup.) You can find it on the "Cisco - Switch" symbol sheet.

Use this symbol for each workgroup. You can find it on the "Cisco - Computer" symbol sheet. Put a text label on each workgroup that tells its designated name (location) and group size.
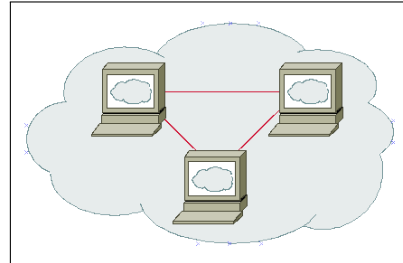
Connect the symbols with lines that indicate their wiring relationship to one another. Do not use arrow heads on your lines.

Chapter 9

Task L3
Router Configuration

- Status: Officially Assigned.
- Discussed: Mon, Dec 14
- 50pt 1st Try: Fri, Dec 18, 12:00.
- Assisted Retry: Fri, Jan 22 (no points)
- 50pt 2nd Try: Mon, Jan 25, 12:00.
- Assisted Retry: Fri, Feb 12 (no points)
- 50pt 3rd Try: Wed, Feb 17, 12:00.
- Grading Label: **L3**

Summary: Configure a typical home router.

Deadlines: If you complete this task by the 50pt deadline, you will receive 50 points toward your final grade. If not, you receive no points.

9.1   Router

We have several routers available to you. You may be assigned a specific router, or you may be able to select a router.

Before configuring the router, you should use Google or some other method to discover the default password for your router.

9.2   Wiring

Our first task is to insert the router between our ISP (the school) and our lab computer. Before we do this, we must make sure the lab computer is properly logged in.

Set the router on your desktop. Plug it into its power supply.

Find the cable from the ISP (the school) to your lab computer.

(ISP) –old-cable– (Lab Computer)

Unplug the cable from the computer and plug it into the Internet port on the router. This port is sometimes labeled WAN (Wide Area Network) or Uplink.

(ISP) –old-cable– (Router) (nothing) (Lab Computer)

Next, run a cable from one of the four downlink ports (labeled 1, 2, 3, 4) on the router, right back into the network port on the lab computer.

(ISP) –old-cable– (Router) –new-cable– (Lab Computer)

When we are done, we will return the wiring to its original configuration.

9.3   Reset The Router

Unless you know the router's administrative password, it will be necessary to reset the router. This gets rid of any passwords and other settings that others may have established. It gives us a clean slate to work with.

Find the red button on the back of the router. It is recessed slightly. Use a pencil or pen (or some other appropriate tool) to hold down the reset button for about ten seconds.

While you are holding down the reset button, if possible, watch the lights on the front of the router. After about ten seconds they will flicker once or twice. This is a signal to you that the reset has been accomplished. If you cannot watch the lights, just hold the reset for a few more seconds to increase your chances of success.

If you are working with a different router, and the reset method is not obvious, do a Google search for "(router model) reset" for advice.

9.4   Find Your Gateway's IP Address

On the lab computer, run the ipconfig command. You are looking for the IP address of your gateway. If you did a reset, it will be:

192.168.1.1

If you are using a different router, similar rules apply.

9.5   Browse to the Gateway

The gateway is running its own mini-webserver. This webserver gives you the way to manage the configuration of the router.

On your lab computer, open a browser. In the URL space, type in the IP address of the gateway.

The router will respond by requiring you to authenticate (log in). For the BEFW11S4 router, the username and password are as follows:

Username: (just leave this blank)

Password: admin

If you are working with a different router, and you do not know the default password of that router, do a Google search for "(router model) default password" for advice.

9.6   Establish A New Password

Select the Administrative tab. You should see a way to key in a new administrative password. Do it. This will keep others from changing your configurations and taking control of your router.

After saving your new password, the router will require you to log in again because your old password is no longer correct.

9.7   Explore The Settings

You can look ahead to the graded task (the last section of this chapter) to see what things will be required of you.

You should explore the settings available to you through the web interface to the router. See if you can figure out what they do. Ask questions in class about the configuration options.

9.8   MAC Address Cloning

Some ISPs will tie a connection to a specific MAC address. If you want to change computers, you would need to wait for the old MAC address to expire. This can take several minutes (or possibly much longer).

To avoid this problem, many routers provide the ability to clone the MAC address of the computer you are using, and then present that MAC address when talking to the ISP.

You may be required to do this. Even if you are not required, it does not hurt, and is probably a good idea.

9.9   Use The Internet

The purpose of being connected is to use the Internet. Make sure the lab computer can browse the Internet. You already know it can reach the router. Going beyond the router will prove that the router is working.

9.10   Establish A Wi-Fi Hotspot

Create a suitable password for your Wi-Fi access point. It will probably need to be at least eight characters long.

Create a suitable SSID (Service Set Identifier) for your Wi-Fi access point. It can be up to 32 characters long.

9.11   The Graded Task

You will be working with the teaching assistants in GCB 119. They will have posted hours on their door. Check in GCB 119 for the correct times.

Normally we have them come to class once or twice (depending on the

number of students in the class) to work with everyone and get everyone passed off on this lab.

Print out the next page, write your name on the sheet, and take it to the teaching assistants.

The TA will fill in the other top blanks of the sheet. Then they will give you a router to work with and a place to work.

Complete the activities on the sheet and have the TA check your work. They should sign the sheet.

Show the sheet to me so I can record your credit.

9.12   Allowable Helps

As you are graded on this lab, you will be working alone, without assistance of other students, and without consulting the Internet.

You are allowed to bring one page of personally hand-written notes. (Written by you yourself. Not printed. Not photocopied.)

Besides your notes you should have no other helps.

1   Teaching Assistant Selections

Use a router provided by Bro Colton via the TA.

The teaching assistant (TA) should randomly select values for the following items. Write the values selected in the blanks below.

(#1) _____ Specify a LAN network number (third quad) between 2 and 255.

(#2) _____ Specify the Router Inside IP Address (last quad) between 2 and 250.

(#3) _____ Specify an Administrative Password to be used.

(#4) _____ Specify a Wi-Fi Password to be used (8+ chars).

(#5) _____ Specify a Wi-Fi SSID to be used.

(#6) _____ Specify a Wi-Fi Channel (1-11) to be used. (Not 6.)

2   Router Configuration

Use a laptop provided by the student, or a computer provided by the TA. The student demonstrates each item to the TA, or the TA verifies the item. The TA should initial the blank at the start of the line. When all items are verified, the TA should sign below. Where (#1) through (#6) are mentioned, replace them by the values specified above.

_____ (1a) Reset the router. Prove that this was done by showing the router configuration.

Call for the TA to verify and initial the item above.

_____ (2a) Set the router network to 192.168.(#1).0.

_____ (2b) Set the router internal IP address to 192.168.(#1).(#2).

_____ (2c) Set the administrative password to the value (#3) shown above.

_____ (2d) Set the Wi-Fi password to the value (#4) shown above.

_____ (2e) Set the Wi-Fi SSID to the value (#5) shown above.

_____ (2f) Set the Wi-Fi channel to the value (#6) shown above.

Call for the TA to verify and initial the items above and below.

_____ (3a) Demonstrate that the laptop has an IP address issued by the router.

_____ (3b) Demonstrate that the laptop is connecting through the router to the Internet, and that several different web sites can be visited successfully.

TA certifies that the lab was completed. Student or TA returns the form to the instructor.

_____ TA Signature

_____ TA Name

_____ Date

Chapter 10

Task L4
Password Report

- Status: Officially Assigned.
- Discussed: Fri, Jan 29
- 30pt Deadline: Mon, Feb 08, 23:59.
- 20pt Deadline: Wed, Feb 17, 23:59.
- Grading Label: **L4**

Submit By Email: This task must be submitted to me by email. The email subject line must be:

```
it280 L4 lastname, firstname
```

This is a research paper. You will write about passwords.

Credit Deadlines: If you complete this task by the 30pt deadline, you will receive 30 points toward your final grade, and possibly extra credit. If not, but you complete it by the 20pt deadline, you will receive 20 points toward your final grade. If not, you receive no points.

Extra Credit: If you fulfill the requirements listed below, you will get full credit. If you go beyond the minimum requirements and impress me with your thought process and your writing, I will give extra credit depending on how impressed I am, up to 10 more points. Probably the top five papers will get extra credit, but I will not know until I see the papers.

Background: Passwords have long been used to authenticate users of computer systems. They can represent a nice balance between convenience and

security.

But are passwords falling out of favor?

Use the Internet to research the question of passwords. Tell the state of the art. What are the best practices? What is good? What is bad?

How long should passwords be? Is this a problem?

How often should passwords be changed? Is this a problem?

What about two-factor authentication? Who uses it? Why? How does it work?

What things are proposed to replace the use of passwords? Do you think they are realistic?

If you were setting up the password requirements for a website, what requirements would you think are reasonable? How many characters would you require? How many characters would you allow? How often would your require password changes? If you do 2FA, what kind would you use?

Please tell what other people advise (including conflicting advice) and why. Then tell what you believe at this time.

Requirements: Submit your lab as a PDF file, as an attachment to an email to me. (Do not submit a doc file or docx file.)

The title page should say "IT 280 Lab 4 Password Report Winter 2015-16" and should give your name. No other information is needed on that page.

Use headings in your paper to make it easy for me to find the answers to the main questions listed above, plus any other questions you thought were important.

If you include any direct quotation of words written by other people, mark them appropriately, like by using quote marks, and indicate the source. Words written by other people should be no more than ten percent of your report. Most or all of your report should be written in your own words. I want this to be your thoughts in reaction to what other people are saying and thinking.

Your Advice: Say what you believe to be the best way to deal with passwords. What policies do you think are best, and why.

Annotated Bibliography: At the end of your paper, list the websites or other sources that you used, and tell briefly what kinds of information you got from each. This is called an annotated bibliography.

There is no particular number of pages required. It should be long enough to cover the subject.

Margins should be about an inch, more or less. I am not too picky.

Use Verdana, 11 point, for the body of your report. Verdana is widely available. If you have trouble finding it, check with me.

Appendix A

Appendix

Contents

A.1 Reporting Spelling Errors

I offer extra credit for reports of spelling and grammar errors in my formal communications, by which I mean written materials like syllabi, study guides, and text books as well as current portions of webpages. This is very helpful to me in correcting spelling mistakes. And it sometimes gets my students to read my materials more carefully.

Using Tools: This has gotten to be sort of a game at times, which makes it fun. We can get into Grammar Nazi mode and be picky, picky, picky. Students will cut and paste my words into a document and then run a spelling checker or grammar checker. Or they will directly open the PDF in a spelling or grammar checker.

Tools Break: You are welcome to do this, but you should be aware that spelling and grammar checkers work by a simplified set of rules compared to real life. If there are two spellings for a word, the spelling checker will commonly only accept one and will reject the other. This does not make the other wrong.

How To Tell Me: To get this credit, send me an email with details of the error (or supposed error) that you have found.

What To Tell Me: Provide enough context that I can easily find the error. Maybe copy and paste the whole paragraph where the error is. I give less credit if you just send me the page number and the wrong word. It is too much like looking for a needle in a haystack. Give me context.

Warning: Language Changes: The truth about English, and probably all languages, is that language changes over time. New words are created. New spellings are accepted. New grammar happens. And old grammar is resurrected.

Style Guides: I generally follow the accepted practices as shown in style guides such as the Chicago Manual of Style. But I take exception to certain things like those that are noted below. For things that I have considered and listed below, even though they may show up with a checker, I do not consider them to be incorrect.

My Rules: My rules are (a) is it commonly done? (b) is it ambiguous? (c) is it pretty? These are the same rules used by grammarians, but our decisions in any given case may be different.

Here is a list of things that have been previously considered.

webpage: Modern usage is split between making this two words, "web page," and one word, "webpage." I have decided to go with the one word version.

website: Modern usage is split between making this two words, "web site," and one word, "website." I have decided to go with the one word version.

themself: Modern usage has tended away from gender-specific words like himself in favor of gender-neutral words. I have migrated from him and her to "singular" **them** as my solution of choice to the gender-neutral dictates of modern political correctness. Some dictionaries do not recognize themself as a word, and instead suggest themselves. For plural them, this would be correct, but for singular them, themself is correct and is documented to have been used as far back in time as the 1400s.

vs: - Should it have a dot? The usage argument is that in British writing, abbreviations are dotted when the final letters have been dropped, but not when the intermediate letters have been dropped. Versus removes intermediate letters. American usage may differ. I do not put a dot after it. I don't like how it looks with a dot. It is a conscious decision, not an error.

zeros: versus zeroes: Both are considered correct. Google says that zeros is more commonly used.

Ambiguous Plurals: The plural of 15 is 15s, not 15's. Using an apostrophe generally indicates possession, but people do commonly (and incorrectly) use an apostrophe for plurals when without it the meaning seems less clear. My choice when making a plural that would look ambiguous is to quote the string being pluralized. So, for me, the plural of (a) is ("a"s) rather than (a's) or (as).

Ambiguous Quoted Punctuation: When should punctuation that is not part of a quote be moved inside the quote marks? Typesetters traditionally float a period (full stop) inside a trailing quote mark because it looks better that way. In computing, quote marks typically delimit strings that have special meaning, and putting punctuation inside the marks changes the meaning of the string. I usually float punctuation if it does not change the meaning of the thing quoted. Otherwise not.

Series Comma: Some people write a list of three things as (a, b and c), but others write it as (a, b, and c). I write it the second way. This is not an error. Both usages are correct, but I find the first usage to be ambiguous, so I almost always use the second form.

A.2   Seeing Your Grade

https://dcquiz.byuh.edu/ is where I maintain my online grade books.

There will be several grade books. One will have your overall grade. Another will have your effort points.

Each grade is identified by a short label.

A.3   Emailing Me

At times you may want to email me regarding this class, or I may ask you to email something to me.

If you follow these instructions, you will receive an instant reply letting you know that I received your email, and that I will respond to it.

Here are the rules.

To: Preferred destination is doncolton2@gmail.com but you could also use don.colton@byuh.edu. They both end up the same place.

Subject: The subject line is important.

For email in general, it looks like this:

```
it280 (normal subject line of your choice)
```

The it280 gets it past my spam filter and helps me organize my work flow. Trust me, some days I get a lot of email. I don't want yours to be lost or overlooked.

The (normal subject line of your choice) is whatever you want it to be.

For email I requested, it looks like this:

```
it280 (item) (lastname, firstname)
```

The (item) is usually a program identifier, or the words "study time" or "lab 4".

The (lastname, firstname) is the name by which you are known on my roll sheet. We will agree on that name early in the semester.

I often reply with "done" so you know I updated your study points.

Email is not 100% reliable. Maybe your email was lost. Maybe my reply was lost. If you do not receive the first reply almost instantly, it probably means I did not get it. Check your sent mail, fix if necessary, and try again. Do you have the correct email address for me? Did you put "it280" at the start of the subject line?

Appendix B

Reporting Spelling Errors

I offer extra credit for reports of spelling and grammar errors in my formal communications, by which I mean written materials like syllabi, study guides, and text books as well as current portions of webpages. This is very helpful to me in correcting spelling mistakes. And it sometimes gets my students to read my materials more carefully.

Using Tools: This has gotten to be sort of a game at times, which makes it fun. We can get into Grammar Nazi mode and be picky, picky, picky. Students will cut and paste my words into a document and then run a spelling checker or grammar checker. Or they will directly open the PDF in a spelling or grammar checker.

Tools Break: You are welcome to do this, but you should be aware that spelling and grammar checkers work by a simplified set of rules compared to real life. If there are two spellings for a word, the spelling checker will commonly only accept one and will reject the other. This does not make the other wrong.

How To Tell Me: To get this credit, send me an email with details of the error (or supposed error) that you have found.

What To Tell Me: Provide enough context that I can easily find the error. Maybe copy and paste the whole paragraph where the error is. I give less credit if you just send me the page number and the wrong word. It is too much like looking for a needle in a haystack. Give me context.

Warning: Language Changes: The truth about English, and probably all languages, is that language changes over time. New words are created.

New spellings are accepted. New grammar happens. And old grammar is resurrected.

Style Guides: I generally follow the accepted practices as shown in style guides such as the Chicago Manual of Style. But I take exception to certain things like those that are noted below. For things that I have considered and listed below, even though they may show up with a checker, I do not consider them to be incorrect.

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Appendix C

Test Bank

Test Bank

1: (p.16) When sending Prof Colton email about IT 280, should I put it280 in the subject line?

2: (p.16) When sending Prof Colton email about IT 280, should I put IT 280 in the subject line?

3: (p.16) When sending Prof Colton email about IT 280, should I put my roll-book name in the subject line?

4: (p.20) Does the CIS department provide tutoring for this class?

5: (p.28) Can I bring blank paper into a test?

6: (p.28) Can I bring notes into a test?

7: (p.28) During tests can I make written notes?

8: (p.28) During tests can I use email?

9: (p.28) During tests can I communicate with others?

10: (p.28) During tests can I use my cell phone?

11: (p.28) During tests can I use my laptop computer?

12: (p.28) During tests can I use Google?

13: (p.29) During tests can I use a language dictionary?

14: (p.29) During tests can I use a calculator?

15: (p.29) Could cheating result in a zero on the assignment?

16: (p.29) Could cheating result in an F in the course?

17: (p.31) Can students with special needs get special accommodations?

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