**CSCI 6345**

**Advanced Computer Networking**

**Dr. John P. Abraham, Professor**

**Syllabus SPRING 2020**

Instructor Name: **Dr. john p. abraham**

Term: **spring 2020**

Telephone Number: **956-665-3550**

Email: **john.abraham@utrgv.edu**

Meeting Times and Location: Thursdays 6:30 to 9 pm. ENGINEERING BUILDING 1.250

Office Location: EIEAB 3.243 (New Eng Bldg in Edinburg)

Office Hours: **W Th 4:00-6:30 pm**

**A note to my students: Computer networking is quite different than most other courses you have taken. There are many ways to accomplish a task. I do not teach you the steps needed to get something done. My instructions to you may look sparse; please be assured it is intentional. That is the only way you are going to learn networking. You probably will have to do lots of attempts before getting intended result. Do not get frustrated. I get many positive comments from students who completed the course successfully. Several of them have landed good jobs in the area of network administration. Rarely one or two students repeat the course mostly because they did not do the assignments on time. All assignments should be done by each student and may not copy from someone else or the Web. However, you can work with others or check the Web to learn the concepts.**

**Required Textbook**: Comer, Douglas E., Computer Networks and Internets, 6th Edition, Prentice Hall, 2015.

ISBN-10: 0133587932 **(**ISBN-13: 978-0133587937**)**

**Please take good notes as I cover a great deal more than in the textbook.**

**Reference books:**

* Behrouz A. Forouzan, TCP/IP Protocol Suite, 4th Ed., McGraw Hill, 2010. ISBN 978-0-07-337604-2
* Lin, Hwang,and Baker. Computer Networks an Open Source Approach, 2012. ISBN 978-007-337624-0
* William Stallings, Data and Computer Communications 10th Edition, 2013, ISBN 0133506487 Pearson.
* *UNIX Network Programming* by W. Richard Stevens, Prentice Hall, 1990

**Expected Background:**

**Students are expected to be able to program in C or ++, C#, VB, Python or Java. Students who are not fluent in these topics should make up the deficiencies by homework and programming exercises.**

**Catalog description**:

In‐depth study of theory, design, implementation and performance of computer and communications networks. Current network types, including point‐to‐point, satellite, packet switch, local area and wide area networks, are studied, as well as evolving technologies such as ATM. Provides an introduction to queuing analysis and includes network programming projects.

In addition to this, students will gain practical experience in setting up communication between computers, networking, and network management. Students will set up servers and clients and create communication between them, setup rights and privileges, create backups, analyze packets, and setup virtual machines.

**System Requirements:**

You will need a computer that can handle VIRTUAL MACHINES, one Linux and one Microsoft Windows based servers and one or two clients. For practical projects students may need to obtain either hardware or software.

Grading:

Midterm and Final Exams 60%

Practical portion (labs), programming 30%

Attendance and other assignments 5%

Online multiple choices quizzes (groups of 4) 5% (submit average of multiple online quizzes)

**COURSE OBJECTIVES**: Upon conclusion of this course a student will be able to plan and install a TCP/IP protocol stack based local area network, set up switches and routers, and write socket programs for communication.

**Learning outcomes:**

* 1. Compare and contrast the OSI and TCP/IP models.
  2. Create virtual servers and workstations
  3. Configure servers, switches and routers.
  4. Create subnets and supernets.
  5. Create routing tables.
  6. Setup static IP address as well as DHCP based scopes.
  7. Setup a DNS and manipulate MX and A records
  8. Setup a wireless network
  9. Install appropriate network security
  10. Write socket programs

**Assignments (lab and programming):**

General instructions about programming: You may choose any of the following languages: C, C++, C#, Java, Visual Basic, or Python. If you would like to use another language please talk with me first. I will not give you any assistance with the programming assignments. You are welcome to talk with others in the class to get general ideas and algorithms, but may not view their source codes.

Assignments are due as specified in the Blackboard. Late penalties: 1 day=10%, 2 days=20%, 1 week=30%, 2 weeks=50%, after two weeks I do not accept assignments (no exceptions).

Generally, there will be one lab assignment per week. Each assignment is built upon the previous assignments. Therefore, do not get behind in your lab assignments. Here are some sample assignments, you may want to do them as early as possible. I reserve the right to ask questions on the test from the lab assignments. **For all assignments, please submit in one word document with all screen captures pasted in it with comments for each screen capture. All assignments should be done by each student and may not copy from someone else or the Web. However, you can work with others or check the Web to learn the concepts. Plagiarism can lead to dismissal from the class and/or from the University.**

1. Download and install VirtualBox (or your choice), Install Linux. Install your printer and make sure printers work from both the host and Linux.
2. Install Windows Professional 7 or above in another virtual machine and install Samba on the Linux and share files between Linux and Windows (both direction).

3. Install a windows server (any version) - do not install domain controller yet.

4. Create remote desktop (windows) as well as LogMeIn or TeamViewer so that you can administer the server remotely.

4. Setup DHCP, DNS and domain controller on the Windows server join the windows client to it.

5. Work each item of the Task Manager, RegEdit, MSconfig, System tools.

6. Work with Windows Server group policy.

7. Work with Cyber Security and Forensic issues.

8. Setup CISCO router using CISCO packet tracer

9. Work with NetAdmin command line utilities

10. Create security groups and assign specific privileges

11. Write socket programs to discover IP addresses and create a chat program.

12. Work with packet analyzer to capture and inspect packets.

13. Create automatic backups using windows server built in software

14. setup VPN

**Some dates to remember**

Jan. 13 (Mon.) Spring classes begin

Jan. 16 (Thurs.) Last day to add or register for Spring classes

Jan. 17 (Fri.) Last day to withdraw (drop all classes) and receive an 80% refund

Jan. 20 (Mon.) Martin Luther King Jr. Holiday. No classes.

Jan. 27 (Mon.) Last day to withdraw (drop all classes) and receive a 70% refund

Jan. 29 (Wed.) Census Day (last day to drop without it appearing on the transcript)

Feb. 3 (Mon.) Last day to withdraw (drop all classes) and receive a 50% refund

Feb. 10 (Mon.) Last day to withdraw (drop all Spring classes) and receive a 25% refund

Mar. 9-14 (Mon.-Sat) Spring Break. No classes.

Apr. 9 (Thurs.) Last day to drop a class (grade of DR) or withdraw (grade of W)

Apr. 10-11 (Fri.-Sat) Easter Holiday. No classes.

Apr. 30 (Thurs.) Study Day. No classes.

May 1-7 (Fri.-Thurs.) Final Exams

**STUDENTS WITH DISABILITIES:** If you have a documented disability (physical, psychological, learning, or other disability which affects your academic performance) and would like to receive academic accommodations, please inform your instructor and contact Student Accessibility Services to schedule an appointment to initiate services. It is recommended that you schedule an appointment with Student Accessibility Services before classes start. However, accommodations can be provided at any time. **Brownsville Campus**: Student Accessibility Services is located in Cortez Hall Room 129 and can be contacted by phone at (956) 882-7374 (Voice) or via email at [ability@utrgv.edu](mailto:ability@utrgv.edu). **Edinburg Campus:** Student Accessibility Services is located in 108 University Center and can be contacted by phone at (956) 665-7005 (Voice), (956) 665-3840 (Fax), or via email at [ability@utrgv.edu](mailto:ability@utrgv.edu).

MANDATORY COURSE EVALUATION PERIOD: Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (<http://my.utrgv.edu/home>); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades.

ATTENDANCE:

Students are expected to attend all scheduled classes and may be dropped from the course for excessive absences. UTRGV’s attendance policy excuses students from attending class if they are participating in officially sponsored university activities, such as athletics; for observance of religious holy days; or for military service. Students should contact the instructor in advance of the excused absence and arrange to make up missed work or examinations.

SCHOLASTIC INTEGRITY:

As members of a community dedicated to Honesty, Integrity and Respect, students are reminded that those who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and expulsion from the University. Scholastic dishonesty includes but is not limited to: cheating, plagiarism, and collusion; submission for credit of any work or materials that are attributable in whole or in part to another person; taking an examination for another person; any act designed to give unfair advantage to a student; or the attempt to commit such acts. Since scholastic dishonesty harms the individual, all students and the integrity of the University, policies on scholastic dishonesty will be strictly enforced (Board of Regents Rules and Regulations and UTRGV Academic Integrity Guidelines). All scholastic dishonesty incidents will be reported to the Dean of Students.

SEXUAL HARASSMENT, DISCRIMINATION, and VIOLENCE: In accordance with UT System regulations, your instructor is a “responsible employee” for reporting purposes under Title IX regulations and so must report any instance, occurring during a student’s time in college, of sexual assault, stalking, dating violence, domestic violence, or sexual harassment about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at [www.utrgv.edu/equity](http://www.utrgv.edu/equity) including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working, and living environment that promotes personal integrity, civility, and mutual respect in an environment free from sexual misconduct and discrimination.

COURSE DROPS: According to UTRGV policy, students may drop any class without penalty earning a grade of DR until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.