**INFS 3338 – Computer Networks and Internet**

Course : INFS 3338 Instructor Name: Dr. Jerald Hughes

Term : Spring 2017 Telephone #: 956-665-3353

Email: j.hughes@utrgv.edu Office location: MAGC 3.114 (E campus)

Meeting times: TR 1630-1745

Office hours: TR 2:00-4:00 PM or by appointment

**Textbook and/or Resource Material**

Required: Douglas E. Comer, Computer Networks and Internets, 6th Edition, Prentice Hall, ISBN: 0-13-358793-2

**Course Description and Prerequisites**

This course provides knowledge of the fundamental concepts of data communication and networking to the students. Topics include Application layer, Physical layer, Data Link Layer, Network Layer, and Transport Layer. In addition, classification of network technologies is explained, including wired and wireless local area networks, wide area networks, and backbone networks. Key concepts underlying network management and network design are emphasized.

Prerequisites: Advanced standing; INFS 3308 and INFS 3310 with 'C' or better.

**Course Learning Goals and Outcomes**

* Outline the basics components of a computer network using both the TCP/IP protocol suite and the OSI model.
* Identify the various types of network systems, including local area networks, metropolitan area networks and wide area networks.
* Recognize the basics of data communications, including data, signals, and conversions between data and signals
* Document the characteristics of local area networks, including hub and switch technologies
* Learn how to use common tools for managing networks and network traffic

**Class Activities**

This is a technical course oriented towards hands-on learning to as a great an extent as possible. Students will have exposure to concepts through textbook chapters, lecture materials, and online resources, but will immediately observe those concepts put into practice, and by hands-on activities on their own computers. In order to replicate the demonstrations, as well as carry out the homeworks, students need to ensure they have access to computers on which they have administrative access, with the following software:

* Wireshark - available at [http://download.cnet.com/Wireshark/3000-2085\_4-10668290.html](http://download.cnet.com/Wireshark/3000-2085_4-10668290.html%20)
* VMWare Player with WinXP and Ubuntu virtual machines installed
	+ VMWare: [http://www.vmware.com/products/player/playerpro-evaluation.html](http://www.vmware.com/products/player/playerpro-evaluation.html%20)
	+ Ubuntu: [https://www.ubuntu.com/download/desktop](https://www.ubuntu.com/download/desktop%20)
	+ WinXP Professional - This is to give you access to administrator controls over typical network functions. This should be installed as a virtual machine in VMWare Player. \*\*Within\*\* the virtual machine, you should install a Firefox browser and another copy of Wireshark.

\*\*\*I will make a copy of this virtual machine available to students who need it\*\*\*.

* DOS command prompt in Windows, both host and virtual, command terminal in Ubuntu both host and virtual

 This software already comes with Windows and Ubuntu, of course. The point here is to make sure that

 you have administrative access, in order to carry out all the learning activities.

This software is installed on machines in the computer lab in MAGC 2.406, HOWEVER, it is highly recommended that you equip your own computers with the same software, so that you will have access to these tools whenever you want, not just during class time.

**Robert C. Vackar College of Business and Entrepreneurship Learning Goals and Mission**

The Robert C. Vackar College of Business Entrepreneurship has adopted the following learning goals and objectives that each student should achieve while in the degree program. Not all goals and objectives are covered in each course; however, all goals and objectives should be addressed throughout the degree program.

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| **BBA Learning Goal** | **This course contributes to the following College of Business and Entrepreneurship learning goals:**  | **How measured**  |
| Demonstrate foundational knowledge of functional area concepts and theories. |  | Homeworks and exams |
| Demonstrate effective business communication skills. |  | Project and paper |
| Apply sustainable practices (economic, social and ethical, and environmental) to business decision-making. | 🞏 |  |
| Demonstrate an understanding of how globalization, including conditions on the US-Mexico border, shape effective business decision making. | 🞏 |  |
| Apply quantitative analytical skills to business decision-making. |  | Project, homeworks |
| Demonstrate the ability to critically analyze business issues. |  | Project, homeworks |
| **IS Major Learning Objectives** | **This course contributes to the following Department of Information learning objectives:**  | **How measured**  |
| Students will understand the role of the Information Systems department is to align Information Systems projects to the strategic goals of the company and to enhance organizational effectiveness.  |  | Homeworks, Project |
| Students will understand concepts needed to design and implement information systems infrastructure.  |  | Homeworks, Project, Exams |
| Students will be able to design and implement information systems infrastructure.  |  | Homeworks, Project |
| Students will be able to communicate effectively orally and in writing. |  | Project  |

Our mission is to be the agent of innovation, knowledge discovery, and economic development in South Texas, Northern Mexico, and beyond, by offering a rigorous curriculum informed by experiential learning, high quality research, and community partnerships. Your mastery of these learning goals and objectives help us to achieve this mission.

**Grading**: The course grade will be based on the following components:

1. **Exams**

There will be two exams, a Midterm and a Final. The exams will be closed book. Exam questions may include Multiple Choice, Fill In The Blank, Short Answer, and Essay. If you cannot be present on the date when an exam is scheduled and have an acceptable official excuse, arrangements must be made with the instructor beforehand and with sufficient notice.

1. **Assignments**

Multiple homework assignments will be given during the semester. Detailed instructions and due dates will be provided. Homework assignments should be submitted in hard copy at the end of class on the due date. Homework assignments from students attending via ITV technology (section 02i) may submit assignments as MS Word email attachments.

1. **Project**

Students will be working in pairs to complete a network design project. Details about the requirements of the project will be provided in the next few weeks.

1. **Term Paper**

You will work in pairs to research, write and present a term paper on a topic related to computer networking in business. Further details will be given in class.

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| --- | --- |
| Midterm Exam | 15% |
| Final Exam | 20% |
| Project | 10% |
| Term Paper  | 10% |
| Homework Assignments | 45% |
| ----------------------------------------------- |
| Total 100% |

**Class Attendance and Participation**

Students are expected to attend all lectures and arrive in class on time. Absences in excess of two class sessions without acceptable documentation may result in a failing grade or a drop from the course. Students arriving late or leaving early will be recorded as tardy. Every two tardy records will count as an absence. Attendance will be checked at the beginning of class hour. Students are advised to be punctual.

**Group Project Grades**

* Each group receives a single grade for a group project or term paper.
* Each group member in a group is expected to contribute equally to the group project and term paper.
* Each team will generate a collaborative agreement specifying the requirements for fair participation on the team. Any difficulties which may arise must be brought to the instructor’s attention before the end of classes.

**Calendar of Activities**

The UTRGV academic calendar and final exam schedule can be found at <https://my.utrgv.edu/home> at the bottom of the screen, prior to login. Some important dates for Spring 2017 include:

Jan 16 MLK Holiday and Day of Service

Jan17 First day of class for full semester

Jan 30 Last day to add a class for spring 2017 semester

Mar 13 – 18 Spring Break, **no classes**

Apr 13 Last day to drop (DR grade) a class or withdraw (grade of W)

Apr 14 – 15 Easter holiday, **no classes**

May 3 Last day of classes for full semester

May 4 Study Day, **no classes**

May 5 - 11 Final Exams ([Schedule](http://www.utrgv.edu/_files/documents/admissions/finalexamsschedule-spring2017.pdf))

**Communication with the Instructor**

University policy requires all email communication between the University and students be conducted through the

students' official University supplied email account. Therefore, please use your UTRGV email for any future correspondence with the instructor. Students are encouraged to communicate with the instructor to resolve any issue concerning this class. If any issue/concern comes up, please take it up immediately without waiting too long. The instructor will generally reply to each email within 24 hours. If your question remains unanswered, please send another email or talk to the instructor either before or after the class, or during the office hours.

**Student Responsibilities**

The College of Business Administration expects students to behave in a professional and respectful manner in the classroom

and during any interaction with professors, colleagues, and other stakeholders (e.g., recruiters). Here are a few specific policies I would like each student to respect while in my course:

* Read and understand course syllabus.
* Check your university-assigned email on a regular basis.
* Read assigned material before class.
* Academic Honesty: Cheating of any kind is an unacceptable behavior and will not be tolerated.
* Do your own work.
* Do not collaborate with others on assignments unless it is a group assignment
* Make sure you **follow instructions and proofread assignments**.
* Arrive to class on time.
* Do not disrupt class.
* No reading non-related materials during class.
* No chit-chat about non-course related topics.
* No NEDs (Noise Emitting Devices, e.g., cell phones, pagers, mp3 players).
* Please place your NEDs on vibrate or turn them off during class.
* A laptop computer used in class should be employed strictly for class related activities.

**UTRGV Policy Statements**

*The UTRGV disability accommodation, mandatory course evaluation statement and sexual harassment statement are required on all syllabi.* Additional policy statements are optional, such as those covering attendance, academic integrity, and course drop policies.

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. 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.

MANDATORY COURSE EVALUATION PERIOD:

Students are required to complete an ONLINE evaluation of this course, accessed through your UTRGV account (https://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. Online evaluations will be available:

Feb 15 – Feb 21 for Module 1 courses

Apr 12 – Apr 18 for Module 2 courses

Apr 12 – May 3 for full spring semester courses

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, 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.

SCHEDULE

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| **Week** | **Topics** | **Chapters** | **Homeworks** |
| Jan 17,19 | Introduction and overview, syllabus, platform toolsMajor concepts, Layered network models, Internet trends | 1 & 2 | HW 1 - address identification - 1/24HW 2 - Packet capture - 1/24HW 3 - Network info in Windows - 1/26 |
| Jan 24,26 | Communication paradigms, client-server modelfile server, web server, DNS server, DHCP server | 3 | HW 4 - FTP client-server connectionHW 5 - Netcat web server |
| Jan 31 Feb 2 | Network sockets APIInternet applications - server services, ports, RFC documents | 3 continued | HW 6 - Making a TCP connectionHW 7 - Using socket API in python |
| Feb 7,9 | Internet Applications:Web protocols and standards | 4 | HW 8 - Understanding Network ServicesTEAMS SELECT PAPER TOPICS |
| Feb 14,16 | Web server commands (GET, etc)Server responses - Using Wireshark, FTP servers | 4 continued | HW 9 - Using network toolsHW 10 - Web server interactionHW 11 - FTP commands |
| Feb 21,23 | email servers, DNS servers and servicesReview for midterm | 4 continued | HW 12 - email portsHW 13 - Understanding DNS |
| Feb 28Mar 2 | Transmission media - cables, radioMeasures, problems and solutions | 7 & 9 | PAPER BIBLIOGRAPHIES DUE |
| Mar 7,9 | Transmission modes, midterm reviewMIDTERM - March 9 | 7 & 9 continued |  |
| Mar 14, 16 | SPRING BREAK |  |  |
| 10 | Return and go over midtermsModulation and modems | 10 | PAPER DETAILED OUTLINES DUENETWORK PROJECT DESCRIPTIONS DUE |
| 11 | Packet switching Network types and topologies | 13 |  |
| 12 | Internet addressingCIDR, IPv4, assigned addresses, Subnetting part 1 | 21 |  |
| 13 | Ethernets - frames, wiring, generationsSubnetting continued | 15, 21 | PAPER FIRST DRAFT DUE |
| 14 | IPv6, Network designs continuedARP | 21 continued23 | HW 14 - ARP information |
| 15 | DHCP, NATreview for final exam | 23 continued | NETWORK PROJECTS DUEFINAL PAPERS DUE |