COURSE SYLLABUS

Semester: Spring 2013

Course Prefix/Number: COP4635

Course Title: Systems & Networks II.

Course Credit Hours: 4.0

Instructors’ Names and Contact Information:

Dr. Thomas Reichherzer
Computer Science (main campus)
Building 4, Room 427
Email: treichherzer@uwf.edu
Phone: (850) 474-2612.
Office Hours:
   Tuesday: 2:30pm – 3:30pm,
   Wednesday: 2:00pm – 3:00 pm

Course Website: http://elearning.uwf.edu/ (login and select COP4635)

Prerequisites or Co-requisites:
- COP4634 System & Networks I

Course Description: This course is a continuation of topics discussed in System & Networks I, focusing on fundamental principles of modern computer networks and network programming. The course will study the structure of networks, networking devices, network protocol stacks, congestion and flow control analysis and algorithms, network routing algorithms, and network traffic analysis. The role of security in both operating systems and networks is also covered.

Topics covered in this course include:

- **Network Architecture**: Computers and devices are connected to build networks of different topologies and sizes to facilitate resource and information sharing. Operating systems and special hardware provide access to computer networks, managing how data is packaged and transmitted over a computer network. The network transports data packages by following a specific network protocol to ensure that data packages reach the recipient.

- **Network Devices**: Special devices are needed to build computer networks, to connect network cables and link computers, sensors, and handheld devices. The network devices execute specific protocols for transporting data in the network. Devices commonly used in building computer networks and linking printers and computers to the network include
routers, switches, bridges, wireless access points, and network cards.

- **Network Protocols:** A network protocol is a precise description of a set of rules to establish and maintain communication between hosts in a computer network. The protocols are usually developed by a group of industry and science experts that are typically sponsored by an international organization. Popular network protocols include TCP (Transmission Control Protocol) and IP (Internet Protocol). Software and hardware implement protocols to facilitate communication in the network. Protocols address important issues of flow and congestion of data in small and large-scale networks.

- **Network Security:** A variety of different protocols and network devices exist to ensure integrity of user data during transfer between hosts as well as availability and access to the network. Protocols may utilize encryption technologies that scramble user data, making them unreadable to any users capturing them during data transfer. Firewalls may help preventing or limiting access to hosts in a network.

- **Network Applications:** A variety of network applications exist to configure networks, monitor traffic, and, most importantly, provide a variety of services for end users. Sample applications include a Web server that provides access to Hyperlinked and multi-media documents based on HTTP (Hyper-text Transfer Protocol), and Email clients that receives and sends messages by communicating with a mail server based on a variety of protocols.

- **Network Programming:** Network communication processes executing in local and wide-area, wired and wireless networks receive and send messages through a software interface called sockets. There are two types of sockets, streaming sockets and datagram sockets for reliable and unreliable data transfer. Data can be sent and received in unicast, multicast, and broadcast mode.

**Course work:** You are expected to complete any assigned readings and to work diligently on the assigned class projects to achieve the highest grade. Project work requires you to solve several programming problems in teams of two. Project start and due dates are specified on the assignment. The schedule includes tentative project times. At the due date of the project, you must demonstrate your work as a team in the lab during an assigned time. If you miss a demonstration for one of the projects but your team member can demonstrate your joint work, points will be deducted for your missed presentation. If both team members fail to demonstrate their project on the day of a project presentation, you will receive no points for the project and there will be no make-ups on project work. There will be a total of 5 projects of which 4 must be completed. Each team is randomly assigned to either group A or B at the start of the semester by your instructor. All groups must complete the first, second, and last project. Group A must work on project three, group B must work on project four. You may choose to work on all projects.

In addition to project work, you must complete two written exams. There will be no makeup exams given unless you can document a serious, medical or legal issue that prevented your attendance of the exam. You are required to notify your instructor within 24 hours prior or after
the exam to explain your situation.

**Expected Outcome:** At the conclusion of this course, students should be able to

- explain data transmission protocols and their role in network communications,
- understand the structure of local and wide-area wired networks and wireless networks,
- distinguish between TCP and UDP sockets for designing network applications,
- write socket-based network programs to implement client/server and peer-to-peer services,
- distinguish between routing and forwarding and analyze routing algorithms for different network topologies,
- contrast IPv4 and IPv6,
- calculate network performance metrics,
- perform congestion and flow control analysis,
- understand security issues and know how to address them.

**Technology requirements:** Programs will be written in ANSI standard C using the computer systems provided in the Computer Science laboratory at REEF and at UWF. These computers use various operating systems.

**Textbooks:** The textbooks for this course are


**Grading:**

<table>
<thead>
<tr>
<th>Score Range</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>100-93</td>
<td>A</td>
</tr>
<tr>
<td>92-90</td>
<td>A-</td>
</tr>
<tr>
<td>89-87</td>
<td>B+</td>
</tr>
<tr>
<td>86-83</td>
<td>B</td>
</tr>
<tr>
<td>82-80</td>
<td>B-</td>
</tr>
<tr>
<td>79-77</td>
<td>C+</td>
</tr>
<tr>
<td>76-73</td>
<td>C</td>
</tr>
<tr>
<td>72-70</td>
<td>C-</td>
</tr>
<tr>
<td>69-67</td>
<td>D+</td>
</tr>
<tr>
<td>66-63</td>
<td>D</td>
</tr>
<tr>
<td>&lt; 63</td>
<td>F</td>
</tr>
</tbody>
</table>

**Expectations for Academic Conduct/Plagiarism Policy:** As members of the University of West Florida, we commit ourselves to honesty. As we strive for excellence in performance, integrity (personal and institutional) is our most precious asset. Honesty in our academic work is vital, and we will not knowingly act in ways which erode that integrity. Accordingly, we pledge not to cheat, nor to tolerate cheating, nor to plagiarize the work of others. We pledge to share community resources in ways that are responsible and that comply with established policies of
fairness. Cooperation and competition are means to high achievement and are encouraged. Indeed, cooperation is expected unless our directive is to individual performance. We will compete constructively and professionally for the purpose of stimulating high performance standards. Finally, we accept adherence to this set of expectations for academic conduct as a condition of membership in the UWF academic community.

Any occurrence of academic dishonesty, including all forms of cheating and plagiarism, will result in action ranging from a grade of zero on the assignment to expulsion from the university. Students are expected to review UWF’s Student Code of Conduct and Academic Misconduct Policy at http://uwf.edu/osrr/.

Assistance: The Student Disability Resource Center (SDRC) at the University of West Florida supports an inclusive learning environment for all students. If there are aspects of the instruction or design of this course that hinder your full participation, such as time limited exams, inaccessible Web content, or the use of non-captioned videos and podcasts, please notify the instructor or the SDRC as soon as possible. You may contact the SDRC office by e-mail at sdrc@uwf.edu or by phone at (850) 474-2387. Appropriate academic accommodations will be determined based on the documented needs of the individual.

Other Course Policies

Online Resources: Please explore the UWF Online Campus Web site to familiarize yourself with online resources (e.g., tips, FAQs). In this course, we will use the eLearning system to distribute assignments and course-related resources.

Communication: I am available during office hours for any course-related questions you may have. For visitations outside the office hours, please make an appointment with me by email. You are responsible for checking your UWF email and the eLearning course room to keep up with important announcements and to access class resources, assignments, etc.

Class attendance: Attendance is strongly encouraged. You are responsible for all announcements and material covered in class. If you miss a class due to medical or other unforeseen circumstances, you are responsible to obtain notes from a classmate to determine what you have missed. If you miss the lab on the day of your presentation, you need to be sure that your team partner will be able to demonstrate the work to receive partial credit.

Grades: Grades will be posted in eLearning. It is your responsibility to ensure that the grades you receive on your paper copy of projects or exams accurately reflect the grades posted online. Final grades will be calculated using the standard UWF grade distribution. For withdrawal deadlines from individual or all registered courses please visit the UWF Academic Calendar at http://uwf.edu/registrar/annualcal2011-2012.pdf. Withdrawals after the deadline will result in a grade of WF or withdrawal-failing. Applying for an incomplete or I grade will be considered
only if: (1) there are extenuating circumstances to warrant it, AND (2) you have a passing grade and have completed at least 70% of the course work, AND (3) approval of the department chair.

Participation and Feedback: I encourage active participation and regular feedback. I believe that effective communication between the instructor and students will make the course more useful, interesting, and productive. Please see me during office hours or contact me in the course discussion area if you have any questions, concerns, or suggestions!

Important Note: Any changes to the syllabus or schedule made during the semester take precedence over this version.