**King Saud University**

**College of Computer and Information Sciences**

**Department of Information Systems**

**IS 370 – Data Transmission and Computer Networks (3-0-1)**

**Summer Semester, Academic Year 2012-2013**

**Section 341: Saturday, Monday and Wednesday (8:00 AM – 10:00 AM)**

**Section 343: Saturday, Monday and Wednesday (10:00AM – 12:00AM)**

**Current Instructor:** Dr. Mohammad Mehedi Hassan

Department of Information Systems

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Office Hours: Sat, Mon and Tue 1pm -2pm, or by appointments

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**Course Coordinator:** Dr. Mohammad Mehedi Hassan

**Textbook(s) and/or Other Required Materials:**

#### Primary: James F. Kurose and Keith W. Ross, [Computer Networking: A Top-Down Approach](http://wps.aw.com/aw_kurose_network_5/), Addison-Wesley, 5th edition.

#### Supplementary:

* Richard Stevens, Bill Fenner, and Andrew M. Rudoff, "[UNIX Network Programming, Vol. 1: The Sockets Networking API](http://www.unpbook.com/)", Addison-Wesley, 3rd edition.
* Bruce Molay, "[Understanding Unix/Linux Programming: A Guide to Theory and Practice](http://wps.prenhall.com/esm_molay_UNIXProg_1)", Prentice Hall.
* Douglas Comer and David Stevens "[Internetworking with TCP/IP Volume III: Client-Server Programming and Applications, Linux/POSIX version](http://www.cs.purdue.edu/homes/dec/netbooks.html)", Prentice Hall.
* Elliotte Rusty Harold "[Java Network Programming](http://www.ibiblio.org/java/books/jnp3/)", O'Reilly, 3rd edition.
* DJorg Liebeherr and Magda El Zarki "[Mastering Networks: An Internet Lab Manual](http://www.cs.virginia.edu/~itlab/book/)", Addison-Wesley.

**Course Description (catalog):**

This course covers: definition of computer networks and their objectives and applications. Computer network architecture: layering, protocols and standard models, the ISO OSI and TCP/IP reference models. It covers the application layer and its protocols (HTTP, FTP etc). The transport protocols namely UDP and TCP. The network layer and IP, intro to routing algorithms. Data link layer: data link layer functions and standards, error check and correction.

**Prerequisites :** IS201

**Co-requisite:** CSC227

**Course Type:** Required

**Course Learning Outcomes:**

After completing this course, the students will be able to:

1. Become familiar with layered communication architectures (OSI and TCP/IP) => j
2. Learn about types of delay in packet switching => a
3. Understand the client/server model and key application layer protocols => j
4. Understand the need for a web cache => a
5. Understand the concepts of reliable data transfer and how TCP implements these concepts => j
6. Know the principles of congestion control and trade-offs in fairness and efficiency => j
7. Learn the principles of routing and the semantics and syntax of IP => j
8. Understand the basics of error detection including parity, checksums, and CRC => a

**Student Outcomes Covered by Course**

|  |  |  |
| --- | --- | --- |
| **Outcome** | **Student Outcome Description** | **Coverage** |
| (a) | 1. An ability to apply knowledge of computing and mathematics appropriate to the discipline | **√** |
| (b) | 1. An ability to analyze a problem, and identify and define the computing requirements appropriate to its solution |  |
| (c) | 1. An ability to design, implement, and evaluate a computer-based system, process, component, or program to meet desired needs |  |
| (d) | 1. An ability to function effectively on teams to accomplish a common goal |  |
| (e) | 1. An understanding of professional, ethical, legal, security and social issues and responsibilities |  |
| (f) | 1. An ability to communicate effectively with a range of audiences |  |
| (g) | 1. An ability to analyze the local and global impact of computing on individuals, organizations, and society |  |
| (h) | 1. Recognition of the need for and an ability to engage in continuing professional development |  |
| (i) | 1. An ability to use current techniques, skills, and tools necessary for computing practice. |  |
| (j) | 1. An understanding of processes that support the delivery and management of information systems within a specific application environment. | **√** |

**Course Outcomes vs. Student Outcomes**

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| # | Course Outcomes | ABET Student Outcomes | | | | | | | | | |
| A | B | C | D | E | F | G | H | I | J |
| 1 | Become familiar with layered communication architectures (OSI and TCP/IP) => j |  |  |  |  |  |  |  |  |  | x |
| 2 | Learn about types of delay in packet switching => a | x |  |  |  |  |  |  |  |  |  |
| 3 | Understand the client/server model and key application layer protocols => j |  |  |  |  |  |  |  |  |  | x |
| 4 | Understand the need for a web cache => a | x |  |  |  |  |  |  |  |  |  |
| 5 | Understand the concepts of reliable data transfer and how TCP implements these concepts => j |  |  |  |  |  |  |  |  |  | x |
| 6 | Know the principles of congestion control and trade-offs in fairness and efficiency => j |  |  |  |  |  |  |  |  |  | x |
| 7 | Learn the principles of routing and the semantics and syntax of IP => j |  |  |  |  |  |  |  |  |  | x |
| 8 | Understand the basics of error detection including parity, checksums, and CRC | x |  |  |  |  |  |  |  |  |  |

**Major Topics covered and schedule in weeks:**

* **Introduction to Computer Networks (1 weeks)**
* **Application Layer Protocols (1 weeks)**
* **Transport Layer (1 weeks)**
* **Network Layer (1 weeks)**
* **Link Layer (1 weeks)**

**Assessment Plan for the Course:**

Quizzes 10%

Assignments 10%

Participation 10%

Mid-Term Exam [3rd week] 30%

Final Exam [5th week] 40%

Total 100%

**Course Policies:**

* Attendance is mandatory. Those who exceed 25% will not be allowed in the final exam.
* All reports and assignments should be submitted on time; no grades will be given for late submissions
* Copying project or home assignments results in zero grading.
* No late project will be accepted.
* The quizzes may be pop or announced, and may be given at anytime during class-time
* All exams are closed book.
* The final exam will be comprehensive.