The University of Georgia

Department of Computer Science

Course Information Sheet

CSCI 4760

Computer Networks

Brief Course Description
(50-words or less)

In-depth coverage of computer networks, including: digital data transmission and encoding, layered protocol models, Internet protocol, Internet client-server software, and network design methodology.

Extended Course Description / Comments

Pre-Requisites and/or Co-Requisites

CSCI 2720

And (CSCI 2670 or CSEE 2220)

Approved Textbooks
(if more than one listed, the textbook used is up to the instructor's discretion)

Author(s): James F. Kurose and Keith W. Ross
Title: Computer Networking: A Top-Down Approach
Edition: 5
ISBN-13: 978-0136079675

Author(s): Larry L. Peterson and Bruce S. Davie
Title: Computer Networks: A Systems Approach
Edition: 4
ISBN-13: 978-0123705488

Specific Learning Outcomes (Performance Indicators)

These are a (non-exhaustive) list of specific, measurable outcomes, as they relate to course and program objectives.

This course introduces principles and concepts used for the design of computer networks. At the end of the semester, all students will be able to do the following:

1. Design and implement a simple network protocol
2. Measure network connectivity properties by using software tools such as ping and traceroute.
3. Develop client programs that can communicate with real Internet servers.
4. Explain the connection setup and termination process of transport layer.
5. Parse a network trace dumps.
6. Assign IP addresses to host and networks.
7. Give examples of access control mechanisms used by link layer protocols.
8. Explain the need of secure network communication.

Relationship Between Student Outcomes and Learning Outcomes

		Student Outcomes										
		a	b	c	d	e	f	g	h	i	j	k
Learning Outcomes	1		•	•						•		•
	2		•							•		
	3		•	•						•		
	4		•									
	5		•							•		
	6		•							•		•
	7									•		
	8					•						

Program Outcomes

(These are ABET-specified and should not be changed)

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.
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.
k. An ability to apply design and development principles in the construction of software systems of varying complexity.

Major Topics Covered
(Approximate Course Hours)

3 credit hours = 37.5 contact hours
4 credit hours = 50 contact hours

Note: Exams count as a major topic covered

Concept of Network Protocol (2-hours)
Layering and Protocol Stack (3-hours)
Addressing (3-hours)
Socket programming (3-hours)
History of Internet (1-hour)
Measurement of the Internet (3-hours)
HTTP Protocol (2-hours)
Performance model of HTTP (3-hours)
Content Delivery Network (2-hours)
Domain Name System (3-hours)
Reliable Transmission (2-hours)
TCP Protocol (2-hours)
UDP Protocol (1-hours)
Congestion Control (3-hours)
TCP Flow Control (2-hours)
Internet Routing (2-hours)
Traffic Analysis (3-hours)
Multiple Access Control (3-hours)
Address Translation (2-hours)
Fundamental of network security (3-hours)
Recent development in computer networking (2-hours)

Assessment Plan for this Course

Each time this course is offered, the class is initially informed of the Course Outcomes listed in this document, and they are included in the syllabus. At the end of the semester, an anonymous survey is administered to the class where each student is asked to rate how well the outcome was achieved. The choices provided use a 5-point Likert scale containing the following options: Strongly agree, Agree, Neither agree or disagree, disagree, and strongly disagree. The results of the anonymous survey are tabulated and results returned to the instructor of the course.

The course instructor takes the results of the survey, combined with sample student responses to homework and final exam questions corresponding to course outcomes, and reports these results to the ABET committee. If necessary, the instructor also writes a recommendation to the ABET committee for better achieving the course outcomes the next time the course is offered.

How Data is Used to Assess Program Outcomes

Each course Learning Outcome, listed above, directly supports one or more of the Student Outcomes, as is listed in "Relationships between Learning Outcomes and Student Outcomes".

Course Master

Dr. Kang Li

Course History

Spring 2011, taught by Dr. Kang Li
Spring 2012, taught by Dr. Roberto Perdisci

05/2008 Course information uploaded to CAPA
02/2012 Course Information Sheet Updated