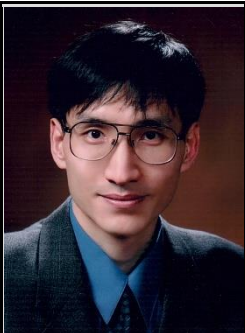


Extended Syllabus (2024 Spring Semester)

Course Title	Int. to Computer Networks	Course Number	CSE4175
Credit	3	Enrollment Eligibility	
Class Time	Wednesday and Friday (15:00~16:15)	Classroom	01

	Prof. Sungwook kim	Homepage: http://network.sogang.ac.kr/
	E-mail: swkim01@sogang.ac.kr	Telephone: (02) 705-8932
	Office: AS 903 Office Hours: M,Tue,Thu. 11:00-17:00 am or by appointment	

I Course Overview

1. Description					
This is a first course on computer networking. Will focus on the basic principles applied in the Internet and the wireless mobile networking. This will allow for the solid understanding of the fundamentals in networking and network applications. Will cover several important network applications, transport layer protocols, routing algorithms, mobility management schemes, contents distribution networks, and network security issues. Internet of Things, Information centric networking, and ad hoc networks such as Bluetooth and vehicle networks will also be introduced					
2. Prerequisites					
none					
3. Course Format (%)					
Lecture	Discussion	Experiment/Practicum	Field study	Presentations	Other
100 %	0%	0%	0%	0%	0%

4. Evaluation (%)							
mid-term Exam	Final exam	Quizzes	Presentations	Projects	Assignments	Participation	Other
45 %	45 %	0%	0%	0%	10 %	0 %	0 %

II Course Objectives

This course is an under-graduate level course on a selected set of topics in computer networking. The goal is to provide in-depth knowledge on a number of basic topics in computer networking. Students need not have prior knowledge of networking. However, the course will move relatively fast. Some topics is related to game theory for network design. In Particular, solid understanding of the fundamentals in networking and network applications in the fixed and mobile network environment

III Course Format

Lecture based approach.

An introduction to the design and analysis of computer communication networks. Topics include application layer protocols, Internet protocols, network interfaces, local and wide area networks, wireless networks, bridging and routing, and current topics.

IV Course Requirements and Grading Criteria

Homework 10%
Mid. Exams 45%
Final Exam 45%

V Course Policies

Attendance and Work: All students should attend class unless discussed with the instructor.

Note: If you have a disability which will make it difficult for you to carry out the work as outlined here, or you need special accommodations/assistance due to a disability, please contact professor.

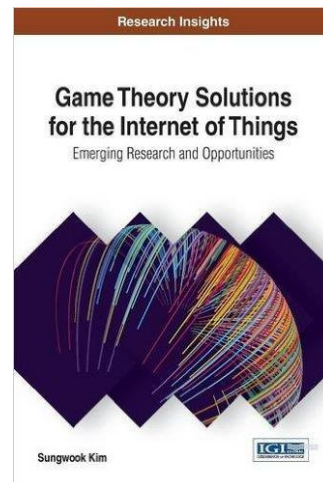
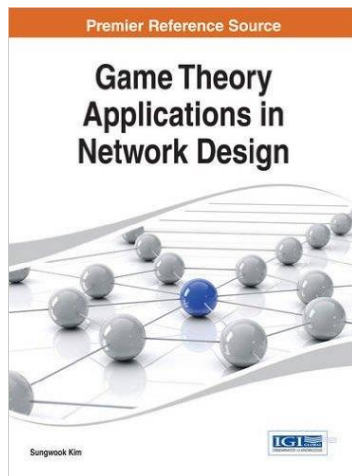
VI Materials and References

Textbook

James F. Kurose and Keith W. Ross, *Computer Networking: A Top-Down Approach*, Pearson Addison-Wesley.

References

- 1) Andrew S. Tanenbaum and D.J. Wetherall, *Computer Networks*, Prentice-Hall, 2011.
- 2) Game Theory Applications in Network Design
- 3) Game Theory Solutions for the Internet of Things: Emerging Research and Opportunities



Class WWW site: <http://network.sogang.ac.kr/>

VII Course Schedule

Week 1	Learning Objectives	
	Topics	Introduction to computer networks and the Internet
	Class Work (Methods)	Lecture
	Materials (Required Readings)	
	Assignments	

Week 2	Learning Objectives	
	Topics	Principles of network applications, Web and HTTP
	Class Work (Methods)	Lecture
	Materials (Required Readings)	
	Assignments	
Week 3	Learning Objectives	
	Topics	Application Layer (1)
	Class Work (Methods)	Lecture
	Materials (Required Readings)	
	Assignments	
Week 4	Learning Objectives	
	Topics	Application Layer (2)
	Class Work (Methods)	Lecture
	Materials (Required Readings)	
	Assignments	
Week 5	Learning Objectives	
	Topics	Connectionless and connection-oriented transport
	Class Work (Methods)	Lecture

	Materials (Required Readings)	
	Assignments	
Week 6	Learning Objectives	
	Topics	TCP congestion control
	Class Work (Methods)	Lecture
	Materials (Required Readings)	
	Assignments	
Week 7	Learning Objectives	
	Topics	Routing algorithms
	Class Work (Methods)	Lecture
	Materials (Required Readings)	
	Assignments	
Week 8	Learning Objectives	
	Topics	<i>Midterm Exam Period</i>
	Class Work (Methods)	
	Materials (Required Readings)	
	Assignments	

Week 9	Learning Objectives	
	Topics	Routing algorithms
	Class Work (Methods)	Lecture
	Materials (Required Readings)	
	Assignments	
Week 10	Learning Objectives	
	Topics	Routing in the Internet (RIP, OSPF, BGP)
	Class Work (Methods)	Lecture
	Materials (Required Readings)	
	Assignments	
Week 11	Learning Objectives	
	Topics	Cellular Internet access, Mobile Internet service
	Class Work (Methods)	Lecture
	Materials (Required Readings)	
	Assignments	
Week 12	Learning Objectives	
	Topics	Security Issues in computer networks

	Class Work (Methods)	Lecture
	Materials (Required Readings)	
	Assignments	
	Learning Objectives	
	Topics	The Link Layer: Links, Access Networks, and LANs
	Class Work (Methods)	Lecture
Week 13	Materials (Required Readings)	
	Assignments	
	Learning Objectives	
	Topics	Internet of Things and Protocols
	Class Work (Methods)	Lecture
	Materials (Required Readings)	
Week 14	Assignments	
	Learning Objectives	
	Topics	<ul style="list-style-type: none"> ● Ad-Hoc Networking (Bluetooth network, Delay Tolerant Network, VANET) ● Information Centric Networking
Week 15	Class Work (Methods)	Lecture
	Materials (Required Readings)	
	Assignments	

	Assignments	
	Learning Objectives	
	Topics	Final Exam
Week 16	Class Work (Methods)	
	Materials (Required Readings)	
	Assignments	

VIII Special Accommodations

Outline of Topics:

- Bandwidth Management
- Cognitive Radio Network Control Problem
- Economic Approach for Network Management
- Game Paradigm for Wired Networks
- Network Resource Allocation
- Network Routing Applications
- Power Control for Wireless Networks
- Network QoS control
- Wireless Sensor/Mesh Networks
- Network Traffic Modeling
- Wireless Network Real-time Control

Special issue:

Game theory for Network Design

IX Aid for the Challenged Students

Student Learning Outcomes:

- Become familiar with layered communication architectures (OSI and TCP/IP).
- Understand the client/server model and key application layer protocols.
- Learn sockets programming and how to implement client/server programs.
- Understand the concepts of reliable data transfer and how TCP implements these concepts.
- Know the principles of congestion control and trade-offs in fairness and efficiency.
- Learn the principles of routing and the semantics and syntax of IP.
- Understand the basics of error detection including parity, checksums, and CRC.
- Know the key protocols for multimedia networking including IntServ and DiffServ for IP.
- Familiarize the student with current topics such as security, network management, sensor networks, and/or other topics.

Priority for the seat assignment may be given.

Any possible convenience will be provided.

FLEXIBILITY IN SYLLABUS:

The syllabus will remain flexible, although modifications would typically be rare and few. Still, if a major disaster happens during the semester I may opt to focus on that for a while. I may also discover that it is beneficial to consider other selected topics or issues, as time passes. If changes are made, these will be made known through a variety of means to you.

CONTACT

For more information about this course, please contact me or the Network Lab. at AS 901.

<http://network.sogang.ac.kr/>

Instructor : Prof. Sungwook kim



Sungwook Kim received the BS, MS degrees in computer science from the Sogang University, Seoul, in 1993 and 1995, respectively. In 2003, he received the PhD degree in computer science from the Syracuse University, Syracuse, New York, supervised by Prof. Pramod K. Varshney. He has held faculty positions at the department of Computer Science of ChoongAng University, Seoul. In 2006, he returned to Sogang University, where he is currently an associate professor of department of Computer Science & Engineering, and is a research director of the Network research laboratory (Network Lab.). His research interests include resource management, adaptive QoS control and game theory for wireless network management.

For Korean students!

이 강좌는 지금까지 영어강의로 진행되었으나 2023년부터 한국어 강의로 전환되어 한국어로 진행됩니다.

이 강좌에서는 기본적인 컴퓨터 네트워크 내부 동작 원리와 사용되는 다양한 프로토콜들을 소개한다. 의 OSI 계층에 7 해당되는 네트워크 계층(network) 트랜스포트(transport), 세션(session), 프리젠테이션(presentation), 응용(application) 계층을 공부합니다. 특히, Internet, local area network, wireless network 등 네트워크에 관련된 기초이론을 다룸으로써 네트워크의 기본을 충실히 이해하도록 하며, 멀티미디어통신망이나 이동멀티미디어통신망과 같은 보다 발전된 네트워크 연구의 근간이 되도록 합니다.