

课程详述

COURSE SPECIFICATION

以下课程信息可能根据实际授课需要或在课程检讨之后产生变动。如对课程有任何疑问，请联系授课教师。

The course information as follows may be subject to change, either during the session because of unforeseen circumstances, or following review of the course at the end of the session. Queries about the course should be directed to the course instructor.

1.	课程名称 Course Title	计算机网络 B Computer Networks B				
2.	授课院系 Originating Department	计算机科学与工程系 Department of Computer Science and Technology				
3.	课程编号 Course Code	CS305B				
4.	课程学分 Credit Value	3				
5.	课程类别 Course Type	专业核心课 Major Core Courses				
6.	授课学期 Semester	秋季 Fall				
7.	授课语言 Teaching Language	英文 English				
8.	授课教师、所属学系、联系方式 (如属团队授课, 请列明其他授课教师) Instructor(s), Affiliation & Contact (For team teaching, please list all instructors)	Asheralieva Alia, 助理教授, 计算机科学与工程系, asheralievaa@sustech.edu.cn Asheralieva Alia, Assistant Professor, Department of Computer Science and Technology, asheralievaa@sustech.edu.cn				
9.	实验员/助教、所属学系、联系方式 Tutor/TA(s), Contact					
10.	选课人数限额(可不填) Maximum Enrolment (Optional)					
11.	授课方式 Delivery Method	讲授 Lectures	习题/辅导/讨论 Tutorials	实验/实习 Lab/Practical	其它(请具体注明) Other (Please specify)	总学时 Total
	学时数 Credit Hours	32		32		64

12. 先修课程、其它学习要求 Pre-requisites or Other Academic Requirements	CS102A 计算机程序设计基础 A Introduction to Computer Programming A
13. 后续课程、其它学习规划 Courses for which this course is a pre-requisite	
14. 其它要求修读本课程的学系 Cross-listing Dept.	

教学大纲及教学日历 SYLLABUS

15. **教学目标 Course Objectives**

This course introduces the basic components, develop history, layering structure and performance metrics for computer networks.

Using Internet as an example, we present the basic principles, main functions and related protocols of network layers: application layer, transport layer, network layer, link layer and physical layer from top to down.

By learning this course, the students should be able to familiar with the components, typical protocols and design principles of the Internet, be able to setup and configure a network and use network analysis tools.

16. **预达学习成果 Learning Outcomes**

1. Learning the main principles of computer communication and the basic concepts in the architecture of computer networks, including the Internet, from an engineering perspective.
2. Comprehending the layered model of computer communication, starting from the application down to the physical layer.
3. Understanding the tasks accomplished at each network level, the goals and trade-offs of each tasks, the algorithms used, and the factors relating to the performance.
4. Studying the key components of the network and the mechanics behind the Internet and web.
5. Analyzing the design and performance analysis of the data communication protocols.
6. Mastering the network administration and network programming.

17. **课程内容及教学日历**（如授课语言以英文为主，则课程内容介绍可以用英文；如团队教学或模块教学，教学日历须注明主讲人）
Course Contents (in Parts/Chapters/Sections/Weeks. Please notify name of instructor for course section(s), if this is a team teaching or module course.)

Lectures:

Introduction (2 classes): Course overview. The history and background of the Internet. Network architectures and protocols.

Application layer (3 classes): The main principles of application-layer protocols. World Wide Web: HTTP. The Internet's directory service (DNS). Sockets.

Transport layer (3 classes): Transport-layer services and principles. Multiplexing and demultiplexing. Reliable data transfer. Congestion and flow control.

Network layer (3 classes): Network services and algorithms. Interdomain and intradomain routing. Switch and router architecture. The Internet protocol (IP).

Link layer, LANs (3 classes): Error detection/correction. Network as a link layer (MPLS). Multiple access protocols, LANs.

Physical layer and conclusion (2 classes): Wireless and Mobile Networks. Wireless link characteristics. Mobility support. Multimedia protocols, Multimedia networking and QoS. Next-generation Internet.

Lab:

1. practice on basic tools for network detection
2. introduction of Wireshark + basic concept on python
3. analysis on http protocol using Wireshark + data type in python
4. analysis on DNS protocol using Wireshark + statement and structure in python
5. analysis on UDP protocol using Wireshark + class an object in python
6. analysis on TCP protocol using Wireshark + practice on python programming
7. introduction about socket programming (using python)
8. practice on socket programming
9. analysis on IP protocol using Wireshark
10. practice on shortest-Path Routing Algorithm (using python)
11. learn to use and configure a router, make a LAN and test
12. practice on project
13. using router to build DHCP and NAT service
14. using network device to test the performance of a network
- 15.16. project presentation

18. 教材及其它参考资料 **Textbook and Supplementary Readings**

1. William Stallings, Data and Computer Communications, 7th. edition, Prentice Hall.
2. James F. Kurose, Keith W. Ross, Computer Networking, 3rd edition, Addison Wesley, 2004.
3. Douglas Comer, Internetworking with TCP/IP, 3th edition, Prentice-Hall. Multiple volumes.
4. W. Richard Stevens, TCP/IP Illustrated, Vol. 1 and 2, Addison Wesley, 1994.

课程评估 **ASSESSMENT**

19. 评估形式 Type of Assessment	评估时间 Time	占考试总成绩百分比 % of final score	违纪处罚 Penalty	备注 Notes
出勤 Attendance				
课堂表现				

Class Performance			
小测验 Quiz			
课程项目 Projects	20%		
平时作业 Assignments	20%		
期中考试 Mid-Term Test	25%		
期末考试 Final Exam	35%		
期末报告 Final Presentation			
其它（可根据需要 改写以上评估方 式） Others (The above may be modified as necessary)			

20. 记分方式 **GRADING SYSTEM**

- A. 十三级等级制 **Letter Grading**
 B. 二级记分制（通过/不通过） **Pass/Fail Grading**

课程审批 **REVIEW AND APPROVAL**

21. 本课程设置已经过以下责任人/委员会审议通过
This Course has been approved by the following person or committee of authority



SUSTech Southern University of Science and Technology