



JOINT INSTITUTE  
交大密西根学院

# Ve489 Computer Networks

## Syllabus

Degree Program:

- ☒ ECE-Electrical & Computer Engineering  
☐ ME -Mechanical Engineering  
☐ General Courses for Both ECE & ME Degree Programs

Course Name: Computer Networks

Course Code: VE489

Course Credits: 4

Course Category: ☐ Required ☒ Elective

Terms Offered:

- ☐ Fall \_\_\_\_\_ (YYYY-YYYY)  
☐ Spring \_\_\_\_\_ (YYYY-YYYY)  
☒ Summer 2020 \_\_\_\_\_ (YYYY-YYYY)

Course Pre/Co-requisites: Ve482, graduate standing, or permission of instructor

Textbook:

<b>Required Texts &amp; Materials</b>	Computer Networks, 4 <sup>th</sup> Edition, Andrew S. Tanenbaum, Prentice Hall
<b>Suggested Texts, Readings, &amp; Materials</b>	Communication Networks, 2 <sup>nd</sup> Edition, Alberto Leon-Garcia and Indra Widjaja, McGraw Hill  W.R. Stevens, et al., UNIX Network Programming, vol. 1: Networking APIs: The Sockets Networking API, 3rd. ed., Addison-Wesley, 2004.



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## Course Descriptions:

This course covers basic system architecture, protocol stack, and algorithms and protocols of computer communication networks. The detailed topics include:

- Get the basic knowledge of computer network architectures, services, applications, and protocol models;
- Study protocols in different layers including physical, data link, network, and transport layers;
- Understand transmission media, switching, multiple access arbitration, network routing, congestion control, flow control, multicast, and security;
- Learn the detailed Internet architecture.

**Instructors:** (Email, Office hours and Office Room No. should be included)

Prof. Xudong Wang

Email: [wxudong@sjtu.edu.cn](mailto:wxudong@sjtu.edu.cn)

Office Phone: 34206765 Ext. 4161

Office Room: 416

Office Hours: Online by appointment

Classroom: Online via zoom

Class Time: Thursday, 10:00-11:40 am  
Sunday, 8:00-10:35 am

## Teaching Assistants:

Name: TBD

Email:

Recitation Time: See TAs' announcement.

TA session: See TAs' announcement.

Place: See TAs' announcement.



## Grading Policy:

<b>Homework</b>	<b>0%</b>	<b>Homework is assigned to help your study, not graded.</b>
<b>Course Projects</b>	<b>30%</b>	<b>3 mini projects</b>
<b>Participation</b>	<b>10%</b>	<b>Attendance and online participation</b>
<b>Research Project</b>	<b>40%</b>	<b>One project that applies computer networks to other systems</b>
<b>Final Exam</b>	<b>20%</b>	<b>Open book exam</b>

## Academic Integrity:

1. Students are required to seriously obey the honor code as regulated by UM-SJTU Joint Institute and SJTU. Violation of the honor code will be reported to the honor council.
2. Students must carefully follow JI' exam room regulations.
3. All registered students are required to attend each class. Absence from class must be approved by the instructor. Students must arrive on time and are not allowed to leave during class unless it is approved by the instructor.
4. Pay attention to your behavior while you are in the zoom classroom. You should maintain proper etiquette throughout the entire lecture hours.
5. Individual course project must be completed independently. The project report must clearly identify the existing work and students' own contribution. Copying work from anywhere is a violation of the honor code.
6. Posting slides of this course to any websites is prohibited. Students are not allowed to distribute slides to anyone.
7. Posting assignments of this course to any websites is prohibited. Students are not allowed to distribute assignments to anyone.

## Detailed Schedule:

<b>Weeks</b>	<b>Dates</b>	<b>Time</b>	<b>Contents</b>
<b>Week 1</b>	<b>May 14</b>	10:00-11:40 am	Introduction, Network services and applications,
	<b>May 17</b>	8:00-10:35 am	Computer network architecture
<b>Week 2</b>	<b>May 21</b>	10:00-11:40 am	Basic Internet architecture
	<b>May 24</b>	8:00-10:35 am	Physical layer
<b>Week 3</b>	<b>May 28</b>	10:00-11:40 am	Physical layer: architecture and technology of communication systems
	<b>May 31</b>	8:00-10:35 am	Modulation, ( <i>Mini Project 1 assignment</i> )
<b>Week 4</b>	<b>June 4</b>	10:00-11:40 am	Data link layer: functionalities, framing
	<b>June 7</b>	8:00-10:35 am	ARQ: schemes, performance, and analysis ( <i>Mini Project 1 due</i> )



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Week 5	June 11	10:00-11:40 am	ARQ, flow control and time recovery, Link layer multiplexing, queuing; Medium access control: principles, Differences between multiplexing, multi-access, and MAC
	June 14	8:00-10:35 am	Approaches of MAC: random access protocols
Week 6	June 18	10:00-11:40 am	Approaches of MAC: random access protocols
	June 21	8:00-10:35 am	Research Project review
Week 7	June 25	10:00-11:40 am	random access protocols
	June 28	8:00-10:35 am	random access protocols
Week 8	July 2	10:00-11:40 am	IEEE 802.11 MAC Protocol
	July 5	8:00-10:35 am	Reservation based MAC protocols, polling
Week 9	July 9	10:00-11:40 am	MAC in various networks, details of bridging and VLANs
	July 12	8:00-10:35 am	Network layer, Routing protocols/algorithms: shortest path routing ( <i>Mini Project 2 assignment</i> )
Week 10	July 16	10:00-11:40 am	Packet-level traffic management: scheduling and prioritization
	July 19	8:00-10:35 am	Flow-level traffic management: admission control, leaky bucket, token bucket
Week 11	July 23	10:00-11:40 am	Flow-level traffic management: admission control, leaky bucket, token bucket ( <i>Mini Project 2 due, Mini Project 3 assignment</i> )
	July 26	8:00-10:35 am	Transport layer: basic mechanisms of TCP and UDP
Week 12	July 30	10:00-11:40 am	The details of TCP
	Aug 2	8:00-10:35 am	Final exam review. <i>Mini Project 3 due, Research Project Due</i>
Week 13	Aug 6	10:00-11:40 am	<b>Final Exam</b>
	Aug 9	8:00-10:35 am	