



浙江大學

ENGG911

Software Defined Networks and Virtualized Network Systems

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Instructor Contact Details

Lecturer-in-charge: Qiang WU

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Office location: Huajiachi Campus, Zhejiang University, Hangzhou, China

Consultation Time: Book appointment by sending email to: wlwyxy_29@zju.edu.cn

Teaching Times, Modes and Locations

Course Duration: 11 Jan 2026 to 30 Jan 2026

Modes: Face-to-face

Location: Huajiachi Campus, Zhejiang University via face-to-face

Academic Level

Postgraduate

Credit Points:

The course is worth 6 units of credit point.

Credit Hours

The number of credit hours of this course equals to the credits of a standard semester- long course.

Contact Hours

The course contains a total of 53 contact hours, which consists of orientation, lectures, seminars, quiz, discussion, research, case study, small tests, assignments, on-site field trip(s), in-class and after-class activities, revision, self-study, and final exam. Students will receive an official transcript which is issued by Zhejiang University when completing this course.

Enrolment Requirements

Eligibility requires enrollment in an overseas university as an undergraduate or postgraduate student, proficiency in English, and pre-approval from the student's home institution.

Course Description:

This course introduces students to the emerging paradigm of Software Defined Networks (SDNs), which separates the network control logic from the physical infrastructure to enable programmable, automated control over network behavior. Students will explore SDN architecture, abstraction layers, controller design, programmable data planes, OpenFlow protocol, and the use of Mininet and other simulation platforms. The course also covers advanced topics including network virtualization, SDN applications in datacenters, and security challenges. Through a mix of lectures, labs, and group projects, students will gain practical experience in programming, testing, and deploying SDN systems. Prior knowledge of computer networks and data communication is expected.

Prerequisite:

N/A

Learning Resources

- Paul Goransson, Chuck Black, Software Defined Networks: A Comprehensive Approach (1st). MK, 2014.

Learning Objectives

By the end of this course, you should be able to:

- Collaborate effectively in teams with clear task management and project coordination.
- Write technical reports and present project outcomes professionally.
- Conduct independent literature reviews to explore and understand new SDN-related technologies.
- Gain deep conceptual understanding of SDN architecture and operational challenges.
- Design SDN-based systems with knowledge of protocols, architecture, and emerging practices.
- Use industry-standard tools to model, test, and deploy SDN prototypes.

Course Delivery:

- Face-to-face Lecture mode includes lectures, seminars, quiz, discussion, research, case study, small tests, assignments, on-site field trip(s), in-class and after-class activities, revision, and final exam.

- The following course will be taught in English. There will also be guest speakers and optional field trips available for students who would like to enhance their learning experience. All courses and other sessions will be run during weekdays.

Topics and Course Schedule:

WK Topic Activities		
1	Introduction to SDN Concepts	Lecture; Tutorial
1	Networking Technologies Overview	Lecture; Tutorial
1	Mininet Setup and Basic Simulation	Lecture; Tutorial
1	OpenFlow Architecture and Emulation Tools	Lecture; Tutorial
1	OpenFlow Basics / Project 1 Launch	Lecture; Tutorial
2	Smart Switches and Flow Rules	Lecture; Tutorial
2	Programming SDN Switches	Lecture; Tutorial
2	Controller Design and Platforms	Lecture; Tutorial
2	Building Simple Controllers	Lecture; Tutorial
2	Programmable Data Planes and P4	Lecture; Tutorial
3	Network Virtualization Concepts	Lecture; Tutorial
3	Virtual Topologies in SDN	Lecture; Tutorial
3	SDN Applications and Use Cases	Lecture; Tutorial
3	SDN in Datacenters	Lecture; Tutorial
3	Revision	Tutorial
	Final exam	Closed book

Assessments:

Class participation	15%
In-class Test	15%
Assignments	20%
Final exam	50%

Grade Descriptors:

HD	High Distinction	85-100
D	Distinction	75-84
Cr	Credit	65-74
P	Pass	50-64
F	Fail	0-49

High Distinction 85-100

- Treatment of material evidences an advanced synthesis of ideas Demonstration of initiative, complex understanding, and analysis.
- Work is well-written and stylistically sophisticated, including appropriate referencing, clarity, and some creativity where appropriate.
- All criteria addressed to a high level.

Distinction 75-84

- Treatment of material evidences an advanced understanding of ideas Demonstration of initiative, complex understanding and analysis Work is well-written and stylistically strong.
- All criteria addressed strongly.

Credit 65-74

- Treatment of material displays a good understanding of ideas
- Work is well-written and stylistically sound, with a minimum of syntactical errors.
- All criteria addressed clearly.

Pass 50-64

- Treatment of material indicates a satisfactory understanding of ideas Work is adequately written, with some syntactical errors.
- Most criteria addressed adequately.

Fail 0-49

- Treatment of ideas indicates an inadequate understanding of ideas Written style inappropriate to task, major problems with expression.
- Most criteria not clearly or adequately addressed.

Academic Integrity

Students are expected to uphold the university's academic honesty principles which are an integral part of the university's core values and principles. If a student fails to observe the acceptable standards of academic honesty, they could attract penalties and even disqualification from the course in more serious circumstances. Students are responsible for knowing and observing accepted principles of research, writing and any other task which they are required to complete.

Academic dishonesty or cheating includes acts of plagiarism, misrepresentation, fabrication, failure to reference materials used properly and forgery. These may include, but are not limited to: claiming the work of others as your own, deliberately applying false and inaccurate information, copying the work of others in part or whole, allowing others in the course to copy your work in part or whole, failing to appropriately

acknowledge the work of other scholars/authors through acceptable referencing standards, purchasing papers or writing papers for other students and submitting the same paper twice for the same subject.

This Academic Integrity policy applies to all students of the Zhejiang University in all programs of study, including non-graduating students. It is to reinforce the University's commitment to maintain integrity and honesty in all academic activities of the University community.

Policy

The foundation of good academic work is honesty. Maintaining academic integrity upholds the standards of the University. The responsibility for maintaining integrity in all the activities of the academic community lies with the students as well as the faculty and the University. Everyone in this community must work together to ensure that the values of truth, trust and justice are upheld.

Academic dishonesty affects the University's reputation and devalues the degrees offered. The University will impose serious penalties on students who are found to have violated this policy. The following penalties may be imposed:

- ✓ Expulsion
- ✓ Suspension
- ✓ Zero mark /fail grade
- ✓ Marking down
- ✓ Re-doing/re-submitting of assignments or reports, and
- ✓ Verbal or written warning.