

Hokkaido University Syllabus					
<div> <div></div> <div>Course Title</div> </div>					
Software Defined Networks					
<div> <div></div> <div>Subtitle</div> </div>					
<div> <div></div> <div>Instructor (Institution)</div> </div>					
Yoshikazu MIYANAGA ( Faculty of Information Science and Technology )					
<div> <div></div> <div>Other Instructors (Institution)</div> </div>					
Yoshikazu MIYANAGA ( Faculty of Information Science and Technology ) Xiaojing Huang Mehran Abolhasan Justin Lipman					
<div> <div></div> <div>Course Type</div> </div>				<div> <div></div> <div>Open To Other Faculties / Schools</div> </div>	OK
<div> <div></div> <div>Year</div> </div>	2019	<div> <div></div> <div>Semester</div> </div>	1st Semester	<div> <div></div> <div>Course Number</div> </div>	215606
<div> <div></div> <div>Type of Class</div> </div>	Lecture	<div> <div></div> <div>Number of Credits</div> </div>	1	<div> <div></div> <div>Year of Eligible Students</div> </div>	~
<div> <div></div> <div>Eligible Department / Class</div> </div>				<div> <div></div> <div>Other Information</div> </div>	
<div> <div></div> <div>Numbering Code</div> </div>					
<div> <div></div> <div>Major Category Code</div> </div>	<div> <div></div> <div>Major Category Title</div> </div>				
<div> <div></div> <div>Level Code</div> </div>	<div> <div></div> <div>Level</div> </div>				
5	Specialized Subjects (basics) in graduate level (Master's Course and Professional Course), Inter-Graduate School Classes				
<div> <div></div> <div>Middle Category Code</div> </div>	<div> <div></div> <div>Middle Category Title</div> </div>				
<div> <div></div> <div>Small Category Code</div> </div>	<div> <div></div> <div>Small Category Title</div> </div>				
<div> <div></div> <div>Language Type</div> </div>					
Classes are in English.					

Key Words

Network, Communications, Software, Hardware, Protocol

Course Objectives

The rapid rise in Internet traffic and services introduced a tremendous amount of pressure on telecommunication network providers. The rate of progress in Network technologies has been recognized as slow to keep up with the emerging data demands. Consequently, both industry and academia have been working on new solutions for networking technologies, which can provide long terms scalability and extensibility. Software Defined Networking (SDN) is a new framework, which is believed to be the answer to the above need. SDN has already made an impact in Data centres and enterprise networks and it is seen as a key technology to improve performance and extensibility both at core and access side of networking technologies. Consequently, there is a significant demand from the Industry for network engineers with SDN skills. This subject will introduce students to SDN and programming SDN applications. Student will learn the major concepts in SDN, Network Function Virtualisation (NFV) and learn the tools needed to develop applications over leading SDN controller (RYU).

## ■ ■ Course Goals

This course aims at students' understanding of several network architectures of wide area network, local area network, personal area network such as smart-phones and digital home appliances. It is expected for the students to obtain basic knowledge for creating novel applications, systems, and services over new networks.

## ■ ■ Course Schedule

Lecture 1: Introduction to SDN  
Lecture 2: SDN Architecture, SDN Controllers and Switches  
Lecture 3: Introduction to Mininet  
Lecture 4: Introduction to OpenFlow  
Lecture 5: Zodiac OpenFlow Switch  
Lecture 6: Data Centre Concepts, Cloud Computing, and Network Function Virtualisation  
Lecture 7: SDN and NFV Applications  
Lecture 8: SDN Slicing and Future of SDN

## ■ ■ Homework

It is required for students to make enough preparation and review before and after each lecture. For each lecture, 90 min preparation and 90 min review are required.  
Lecture materials are available on the e-Learning of Hokkaido University.

## ■ ■ Grading System

Students whose attendance rate is less than 70% cannot get any evaluation. Evaluation is based on the term report (90%) and the lecture participation (10%). By the term report, students' deep understanding of a specific technology and presentation skills are evaluated. The evaluation is based on 5 grades. The ratio of S is not greater than 15% of registered students. The ratio of S and A is not greater 50% of registered students.

## ■ ■ Textbooks

References will be introduced in the lecture.

## ■ ■ Reading List

## ■ ■ Websites

[This course will be provided as part of the Hokkaido Summer Institute.](#)  
[For more information \(invited lecturers, course details, etc.\), please visit the website below:](#)  
<https://hokkaidosummerinstitute.oia.hokudai.ac.jp/courses/CourseDetail=G105>

## ■ ■ Website of Laboratory

<https://csw.ist.hokudai.ac.jp/>

## ■ ■ Additional Information

Related Course (HSI)  
Mandatory Course (Course required to be taken together with this course): Blockchain  
Recommended Course (Course highly recommended to be taken together with this course): Cyber Security

## ■ ■ Update

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