1. Course Code

2224

2. Course Title

Information Network Special Experiments

3. Teacher

YOKOYAMA, Teruaki,　SHIMA, Hisato

4. Term

Fall 2

5. Course Overview and Objectives

This course is consits of two parts, one part taught by Yokoyama, the other part by Shima.

In the part taught by Yokoyama, the students expeience the technologies for constructing and operating computer network and communication functionalities in programming. The aim is to gain an understanding and knowledge of the Internet technologies. The course consists of workshops along with the IP technologies on routers that are the essential technology of the Internet. Moreover, students will experience how to employ communication function on the Internet in their programming, such as Socket and HTTP.

In the part taught by Shima, the students learns about Web APIs and develops application using Web API.

6. Course Goals (Attainment Targets)

(1) To know how the Internet works on routers
(2) To know mechanism of http communication
(3) To know mechanism of Web API and its application
(4)
(5)
(6)

7. Correspondence relationship between Educational goals and Course goals

Educational goals of the school			Course Goals
High level ICT skills	Basic academic skills		
	Specialized knowledge and literacy		(1),(2),(3)
Human skill (Tankyu skill)	Ability to continually improve own strengths		
	Ability to discover and resolve the problem in society	Problem setting	
		Hypothesis planning	
		Hypothesis testing	
		Practice	
	Fundamental Competencies for Working Persons	Ability to step forward	
		Ability to think through	
		Ability to work in a team	
Professional ethics			

8. Course Requirements (Courses / Knowledge prerequisite for this course)

Fundamentals of Information Networks (2201). Basic understanding of shell environment on Linux or command line on WIndows.

9. Textbooks (Required Books for this course)

10. Reference Books (optional books for further study)

11. Evaluation

Goals	Evaluation method & point allocation					
	examination	Quiz	Reports	Presentation	Deliverables	Other
(1)			○			○
(2)			○	○	○	○
(3)				○	○	
(4)						
(5)						
(6)						
Allocation			15	20	30	35

12. Notes

Tursday Lessons are taught by Shima
Saturday Lessons are taught by Yokoyama

13. Course plan

(Notice) This plan is tentative and might be changed at the time of delivery

Thursday-Lesson 1-2: Introduction, Development Environmen

(Lecture 90min, Exercise 90min)

- Overview of the Shima part
- Set up development environment
- Introduction to Python programing

Thursday-Lesson 3-8: Web API and its application

(Lecture 270min, Exercise 270min)

- Use of Various Web services from your applicaiton.
   Google mail, Google Spreadsheet, Weather API, etc.
- Authentication using Oauth 2

Thursday-Lesson 9-10: Designning your application	(Exercise 180min)

- Discussion of application by each team
- Investigate Web APIs

Thursday-Lesson 11-14: Developping your application	(Exercise 360min)

- Development of application by each team

Thursday-Lesson 15: Presentation of your application	(Presentation 90 min)

- Each team present their application

Saturday-Lesson 1: Introduction	(Lecture 90min)

- Overview of this lecture
- Communication on the Internet

Saturday-Lesson 2: Preparation	(Exercise 90min)

- Grouping
- RPI setup

Saturday-Lesson 3: Network Construction (1)	(Lecture 90min)

- Basic instruction for Linux (SSH, IP address assignment, Routing)

Saturday-Lesson 4: Network Construction (2)	(Exercise 90min)

- Initial setup for RPI router

Saturday-Lesson 5,6,7,8: Network Construction (3)(4)(5)(6)	(Exercise 360min)

- Network construction
1st level construction, one PC under one router
- Network test
ICMP (ping/traceroute), tcpdump

Saturday-Lesson 9,10,11,12: Network Construction	(Exercise 360min)

- Network construction
2nd level construction, multiple routers
- Routing configuration
concept, routing add/del

Saturday-Lesson 13,14: Network Construction (11)(12)	(Exercise 180min)

- Additional functions
Dynamic routing, ipfilter
NAT, DHCP, performance evaluation tools

Saturday-Lesson 15: Report	(Exercise 90min)

- Report and presentation