1. Course Code

2279

2. Course Title

Broadband Network and its application

3. Teacher

IWATA, Hideyuki

4. Term

Fall 3

5. Course Overview and Objectives

In this course, the students study the current technologies of the broadband network including implementation, operation and maintenance. Also they study the applications and solutions using the broadband network. The objectives of the course is to understand the broadband network and its application in Japan in order to refer to introduce yourself in your country.

6. Course Goals (Attainment Targets)

(1) Can explain the implementation and operation of fixed broadband network
(2) Can explain the implementation and operation of mobile broadband network
(3) Can explain the disaster relief network
(4) Can explain the applications and solutions using broadband network
(5) Clarification of problems to introduce the broadband network and its application in your country
(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),(4)
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	(5)
Professional ethics			

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

Fundamentals of Information network(2201)

9. Textbooks (Required Books for this course)

None

10. Reference Books (optional books for further study)

None

11. Evaluation

Goals	Evaluation method & point allocation					
	examination	Quiz	Reports	Presentation	Deliverables	Other
(1)			○			
(2)			○			
(3)			○			
(4)			○			
(5)				○		
(6)						
Allocation			80	20		

12. Notes

13. Course plan

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

Lesson 1: Planning and construction of (fixed) access network　　　(lecture 90min.)

learn about current access network in Japan
1. Infrastructure facility
2. Optical fiber cable system
3. Optical network system
4. Access radio system

Lesson 2: Operation and maintenance of (fixed) access network　　　(lecture 90min.)

learn about current operation and maintenance of (fixed) access network in Japan
1. Maintenance of infrastructure facility
2. Maintenance of optical fiber cable system
3. Maintenance of optical network system

Lesson 3: Optical Fiber Technologies　　　(lecture 90min.)

Learn about current optical fiber and cable in Japan
1. Overview of optical fiber
2. Structure and characteristic of optical fiber
3. Connection of optical fiber
4. Overview of optical fiber cable

Lesson 4: Optical Transmission Technologies	(lecture 90min.)

Learn about current optical transmission technologies
 1. Fundamental of optical transmission
 2. Optical trunk line
 3. Optical access systems
 4. Optical video transmission systems

Lesson 5: Operation and maintenance of fixed radio access network	
	(lecture 90min.)

Learn about current operation and maintenance of fixed radio access network in Japan
1. Overview of fixed radio access network system
2. Fundamental access radio technologies
3. Future technologies of access radio technologies

Lesson 6: Overview of core network	(lecture 90min.)

Learn core network technologies
1. PSTN migrations

Lesson 7: Overview of network operation	(lecture 90min.)

Learn network operation technologies
1. Operation networking

Lesson 8: Overview of future core network	(lecture 90min.)

Learn future core network technologies
1. SDN (Soft Defined Network)

Lesson 9: Overview of mobile access network	(lecture 90min.)

Learn mobile access network and NW architecture
1. Mobile Network Architecture overview
2. Evolution of Cellular Network and relevant technologies
3. International Standardization

Lesson 10: Overview of mobile core network	(lecture 90min.)

Learn and understand mobile core network and services
(1) Mobile network architecture overview
(2) Evolution of mobile core network
(3) Services enabled by mobile core network

Lesson 11: 5G overview and applications	(lecture 90min.)

Learn global 5G trends and DOCOMO's activities towards 5G commercialization
1. 5G service overview and underlying technologies
2. 5G standardization status
3. DOCOMO's activities towards 5G commercialization

Lesson 12: ICT solutions in rural area	(lecture 90min.)

Learn case study of ICT solutions in rural area
1. Case study of e-agriculture
2. Case study of e-environmental
3. Case study of e-healthcare
4. Case study of e-learning

Lesson 13: Overview of Disaster Relief Network	(lecture 90min.)

Learn disaster Relief Network
1. Overview of Great East Japan Earthquake
2. Damage situation
3. Recovery and countermeasures

Lesson 14: Future research and Development for Disaster Relief Network	
	(lecture 90min.)

Learn future research and Development for Disaster Relief Network
1. Radio Network technology for Disaster Relief
2. Infrastructure technology for Disaster Relief
3. Case study of Disaster Relief Solutions

Lesson 15: Conclusion	(lecture and presentation 90min.)

In this lesson, the course content from 1st up to 14th reviewed briefly for confirming and supporting student understands. Making some group, discuss about problem if your country is introduced broadband network and its solution.