

Tsuyama College		Year	2020		Course Title	Advanced Information Networks
Course Information						
Course Code	0089		Course Category	Specialized / Elective		
Class Format	Lecture		Credits	Academic Credit: 2		
Department	Department of Integrated Science and Technology Electrical and Electronic Systems Program		Student Grade	4th		
Term	Year-round		Classes per Week	1		
Textbook and/or Teaching Materials	Textbook : "Outline Of The Communication Network"(Morikita Syuppan)					
Instructor	ONISHI Atsushi					
Course Objectives						
Learning purposes : Learning OSI reference model and learning the technical background of physical layer, data link layer and network layer. Learning how to program the communication software using SOCKET. Learning how to build a server on the cloud.						
Course objectives : 1. To understand the fundamental technologies about the wired network and the wireless network 2. To understand the fundamental technologies about data link layer and network layer 3. To understand the fundamental technologies about transport layer 4. To learn how to program the communication software using SOCKET 5. To learn how to build a server on the cloud						
Rubric						
	Excellent	Good	Acceptable	Not acceptable		
Achievement 1	The student can explain the fundamental technologies about the wired network and the wireless network perfectly.	The student can explain the fundamental technologies about the wired network and the wireless network generally.	The student can explain only the minimum technologies about the wired network and the wireless network.	The student can not explain the minimum technologies about the wired network and the wireless network.		
Achievement 2	The student can explain the fundamental technologies about data link layer and network layer perfectly.	The student can explain the fundamental technologies about data link layer and network layer generally.	The student can explain only the minimum technologies about data link layer and network layer.	The student can not explain the minimum technologies about data link layer and network layer.		
Achievement 3	The student can explain the fundamental technologies about transport layer perfectly.	The student can explain the fundamental technologies about transport layer generally.	The student can explain only the minimum technologies about transport layer.	The student can not explain only the minimum technologies about transport layer.		
Achievement 4	The student can explain the features about SOCKET without seeing any document.	The student can explain the some features about SOCKET without seeing any document. And the student can explain the remains while seeing the document.	The student can explain the features about SOCKET while seeing the document.	The student can not explain the any features about SOCKET.		
Achievement 5	The student submitted the report about how to build a server on the cloud within the deadline.	The student submitted the report about how to build a server on the cloud after the deadline, but the student studied voluntarily.	The student studied about how to build a server on the cloud under the teaching.	The student did not submit the report about how to build a server on the cloud.		
Assigned Department Objectives						
Teaching Method						
Outline	General or Specialized : Specialized Field of learning : Information System, programming, network Required, Elective, etc. : Elective subjects Foundational academic disciplines : Information Science, Computer Engineering and related fields / Computer network-related  Relationship with Educational Objectives : This class is equivalent to "(3) Acquire deep foundation knowledge of the major subject area".  Relationship with JABEE programs : The main goal of learning / education in this class are "(A)", A-2.  Course outline : The student can learn the technologies about physical layer, data link layer and network layer more deeply than "Basic Information Networks". And the student can learn how to program the communication software using SOCKET too. Furthermore the student can learn how to build a server on the cloud.					
Style	Course method : The students take turns leading lectures. The teacher gives some homework.  Grade evaluation method : Exams(60%) + Lecture(20%) + Reports(20%). Examinations will be conducted a total of 2 times, and the evaluation ratios will be the same. The teacher does not admit the carry-on of the materials in the examination. The teacher does not carry out the reexamination without defects in the regular examination.					



Notice	Course advice : The student should teach own charge for other students with every effort .
	Fundational subjects : Information Literacy(1st year), Basic Information Networks(2nd) Related subjects : Network Security(4th year), Communication Engineering(4th), Communications Protocol(5th)  Attendance advice : If you are late for the role call twice, you will be treated as a latecomer. The teacher considers that this student was absent once when late twice. The student should not be late for the class so that the student can receive materials surely.

### Course Plan

			Theme	Goals
2nd Semester	3rd Quarter	1st	Guidance	Getting ready to attend the class
		2nd	The change of the communication technology, structure of communicating, information communication network, protocol and OSI reference model, connection oriented communication and connectionless communication	Explain the basic configurations of network components. Explain the modes of connection and mechanisms of remote access including SSH. Explain basic filtering technologies.
		3rd	Evaluation item of communicating and international standardization, significance of modulation, classification of modulation system, analog modulation, digitization of the information, regenerative relay, linear relay and transmission line code	Explain the mechanisms and specifications of wireless communication. Explain the mechanisms and specifications of wired communication.
		4th	Digital modulation, significance of multiplex and the foundation, classification of multiplexing scheme, frequency division multiplexing, positioned multiplexing, label multiplexing	Explain the mechanisms and specifications of wireless communication. Explain the mechanisms and specifications of wired communication.
		5th	Plesiochronous digital hierarchy, outline of switching, classification of switching, line switching, packet switching, frame relay	Explain the basic configurations of network components. Explain basic routing technologies.
		6th	Cell relay, outline of optical fiber communication, basic structure of optical fiber communication, optical fiber, elemental technology of fiber communication(optical fiber is excluded), characteristics of optical fiber communication	Explain the basic configurations of network components. Explain the mechanisms and specifications of wired communication.
		7th	Process of the optical network introduction, synchronous digital hierarchy, wavelength division multiplexing, optical transport network	Explain the mechanisms and specifications of wired communication.
		8th	2nd semester mid-term exam	
	4th Quarter	9th	Return and commentary of exam answers	
		10th	Optical access system, outline of The internet, protocols being used in The internet, information transmission through The internet	Explain the mechanisms and specifications of wired communication. Explain the modes of connection and mechanisms of remote access including SSH. Explain basic filtering technologies.
		11th	IP address, routing, data transmission apparatus, outline of LAN, positioning of the various standards for LAN, Ethernet and its communication standard	Explain the basic configurations of network components. Explain basic routing technologies. Explain basic filtering technologies.
		12th	Data transmission through Ethernet, structure of Ethernet, other wired LAN technology, wireless LAN, expansion of LAN, basic properties of the electric wave	Explain the mechanisms and specifications of wireless communication. Explain the mechanisms and specifications of wired communication.
		13th	Fixed communication above the ground, multiple access, mobile radio communication, satellite communication	Explain the mechanisms and specifications of wireless communication. Explain the mechanisms and specifications of wired communication.
		14th	Summary, supplementary	Explain the major server configuration methods. Explain the methods of development of applications using information communication networks.
		15th	(2nd semester final exam)	
		16th	Return and commentary of exam answers	

### Evaluation Method and Weight (%)

	Examination	Presentation	Mutual Evaluations between students	Behavior	Report	Other	Total
Subtotal	60	20	0	0	20	0	100
Basic Proficiency	0	0	0	0	0	0	0
Specialized Proficiency	60	20	0	0	20	0	100
Cross Area Proficiency	0	0	0	0	0	0	0