Course Title	Introduction to Software Engineering	Instructor(s)	Baiko Sai （実務経験のある教員）
		E-mail	
Class Style	Lecture, seminar, etc.	Office Hours	Friday PM
Track		Mode of Instruction	Of-line
Credits	2	Allocated Year	Third or fourth year
Active Learning	Category 4-(1): Interactive Lectures	Compulsory or Elective	
Course Overview	After reviewing the configuration and operating principles of computer hardware, we will explain the operating principles and roles of computers from the perspective of computer software. Learn the concepts of the OS, which was created to integrate and efficiently utilize the main resources of the CPU, memory, input/output devices, and file systems. In addition to an overview of the structure of the program description system that actually realizes computer systems, we will also learn an overview of the network structure, configuration, and protocols that are essential for modern information processing systems.		
Course Objectives	As part of the study of computer engineering, it is necessary to understand the structure and operating principles of digital computers, learn the basic concepts that make up the operating software (OS), the first large-scale software on digital computers, and network systems, and learn the basic concepts that make up network systems. Furthermore, you will acquire introductory knowledge about the classification, uses, characteristics, and development design flow of application software, which will be useful for your future work and life in the information society.		
Prerequisite			

	No	Contents	Homework
Course Schedule	1	Part 1: Review of computer hardware #1: A summary of what was learned in the first semester, such as the configuration of computer hardware, the five main devices, and the roles of each.	No
	2	Part 2: Software industry #2: An overview of software history, classification, characteristics, and development design flow. Principle of operation of computer system.	No
	3	Part 3: Computer architecture realized through software #3: Programs that interact with CPU, memory, and devices.	No
	4	Part 4: Role and structure of the OS #4: Learn the structure and role of an operating system (OS), which is a program that realizes the functions of a computer system.	No
	5	Part 5: Relationship between OS and hardware #5: Learn the relationship between OS and hardware. Interrupt-driven architecture.	No
	6	Part 6: Processor #6: Processor management, process realization and concept, process state transition and scheduling.	No
	7	Part 7: Threads and smartphones #7: Programming and data sharing using threads, semaphore control and implementation methods, deadlock problem.	No
	8	Part 8: Summary of contents 1 to 7 #8: Quiz ① of contents 1 to 7, discussion.	No

	9	Part 9: Memory management #9: Memory usage in the system, physical memory, virtual memory and address virtualization.	No
	10	Part 10: Virtual memory system #10: Virtual memory system structure, concept, and paging method.	No
	11	Part 11: Input/output system #11: I/O management, programming, disk device structure and disk controller.	No
	12	Part 12: File system #12: Disk space management and file space management, directory structure, file and directory operations, file attributes and access control.	No
	13	Part 13: Realization of information systems #13: Programming systems and programming languages.	No
	14	Part 14: Network system #14: Realizing data communication functions and realizing a highly functional network. Configuration and application of cloud networks.	No
	15	Part 15: Summary #15: Summary of contents from 8 to 14. Free discussion of other hot topics such as ChatGPT. active running.	No
Grading	Quiz 20 % Assignments 30 % Credit validation exam 50% Perform a comprehensive evaluation.		
Textbooks	No		
References	「計算機システム概論」―基礎から学ぶコンピュータの原理と OS の構造 大堀淳 図解でわかるソフトウエア開発のすべて」Mint著、日本実業出版社		
NOTES	Before lecture: Preparation After the lecture: Exercises 担当教員は、30年以上のソフトウェア開発、組み込みエンジニア、暗号システムの開発等の経験を活かし、講義を行う。		