

## Syllabus [2025Year 2 Term]

## Course Information

Course Title	Operating Systems	Credits	3
Course Code	382230-2	Required/Elective (For Undergraduate Courses)	Selective majors
Department or Major	Department of Mobile Systems Engineering	Language	English
Methods of Teaching		Lecture Room	월1,2,3/ 목1,2,3(국제210)
Time Allotment	Lecture(3) Experiments(0) Trainging & Practice(0) Performance(0) Designing & Planning(0)	Cyber Lectures	
Course Type	offline		
Cyber Lectures Preview			

## Lecturer

Lecturer	Name	Yoo, Seehwan	Rank	Associate Professor	Final Academic Degree	이학박사
	Department & college	Organization for SW-Centric University		Office	International Hall 615	
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	Field of Interest					

## Course Summary

Course Description	<p>This class covers essential concepts in operating systems. Operating system is a key software component to make use of every computer. Mainly, this class covers the following topics:</p> <ul style="list-style-type: none"> <li>- Process concepts</li> <li>- Virtual memory</li> <li>- Threads and Synchronization</li> <li>- Storage and File system</li> <li>- Distributed Systems and Cloud computing intro</li> </ul> <p>Course evaluation is performed with two written test(mid/final exam) and programming assignments around the OS concepts.</p>
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Description Related Courses	<p><b>IMPORTANT!</b></p> <p>This course requires intensive lab work, from another course (advanced mobile project2). Therefore, students are recommended to take both of the courses, at the same time. The two courses are co-evaluated according to their lab and lectures from two courses. For the students who want to take one of the two, please contact the professor before registration!</p> <p>The course requires programming skills based on C/assembly. Students will learn program with Linux. In addition, data structure, computer system/ architecture classes are pre-requisite for this class.</p>
Course Goals	To learn core concepts in modern operating systems. The course will focus on generalized concepts that can be applied from servers to mobile devices.
Projected Results	<p>Students will have solid understandings for concepts on operating system, which is essential to understand performance, design and implementations of modern software systems.</p> <p>Understanding the fundamental concepts in operating system is helpful for students those who have questions that are hidden behind application programming interface. It reveals how the computer acts behind the curtain, and what are major considerations during last decades in system software.</p> <p>Mobile operating systems are one of key component in mobile systems because it is heart of mobile software innovations. By learning an OS concepts, students would have more broad perspective, relationships and detailed interaction between hardware and software.</p>
Percentage of the original language classes(%)	
Cyber Lectures Preview	

## Syllabus

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
1	Operating systems intro History Operating Systems Structure	Learn brief history of operating systems and system software Basic building blocks of operating systems, system calls, system entry	Lecture Lecture	
2	Process, Layers of Abstractions (API)	Concept of process, process management Inter-process communications, System V IPC, socket	Lecture Lecture	
3	Threads and Concurrency	Inter-process communications, System V IPC, socket Thread model, concurrency vs. parallelism	Lecture Lecture	Programming assignment
4	Threads Synchronization	Critical section, lock variables, deadlock/livelock, reader/writers problem	Lecture Lecture	

Times	Lecture Topic	Lecture Goals	Lecture Methods	Assignments
		maphore, mutex, mo nitor, spinlocks		
5	CPU scheduling (algorithms)	Time-sharing, Roun d-robin, FIFO, multi -level queues Time -sharing, Round-ro bin, FIFO, multi-leve l queues	Lecture Lecture	
6	CPU scheduling (measures and evaluation)	evaluation, multi-pr ocessor scheduling evaluation, multi-pr ocessor scheduling	Lecture Lecture	
7	Virtual memory (address transla tion)	Memory hierarchy, Cache, resource m ap, memory allocato rs, Paging support	Lecture Lecture	Programming assignm ent
8	Virtual memory (2level paging, b uffer cache, swapping)	Paging, segmentati on, kernel memory a llocation, buddy, sl ab Demand paging, Copy-on-Write	Lecture Lecture	
9	I/O system and Performance	Demand paging, Co py-on-Write	Lecture	
10	Storage and File system (File I/ O and directory structure)	Disk structure and I/O scheduling	Lecture	
11	File indexing (unix file system, ff s)	Disk structure and fi lesystem, fast index ing	Lecture	
12	Log-structured filesystem	Recovery, Durabilit y, Transaction proc essing	Lecture	Programming assignm ent
13	Distributed Systems and protoc ols	2-phase commit pro tocol, RPC	Lecture	
14	Cloud computing	Cloud computing, pl atform technology, I AAS, PAAS	Lecture	
15	Conclusion	Semester final	Lecture	

## Methods of Grading

sequen ce	Description	Percentage	Details
1	Mid-tem Exam	20%	Mid term written exam
2	Final-exam	0%	
3	Pop Quizzes	0%	
All		100%	

sequence	Description	Percentage	Details
4	Assignments	50%	3 project works , 2+ programming assignments
5	Reports	0%	
6	Presentations & Discussions	0%	
7	Attendance	20%	Attendance
8		0%	
9	Others	10%	in-class participation, survey homework
All		100%	

## Core of Value

핵심가치	전공역량	역량정의	역량구분	값(%)
혁신 (Discovery)	창의적문제해결 (Creative problem-solving)	주어진 상황과 문제를 창의적으로 해결할 수 있는 능력		0%
혁신 (Discovery)	도전 (Challenging)	전공 지식을 새로운 분야와 융합하고 아우를 수 있는 능력	부역량	0%
혁신 (Discovery)	지식융합 (Knowledge convergence)	새로운 분야를 개척하거나 도전적으로 임할 수 있는 능력		0%
헌신 (Dedication)	세계시민 (Universal value)	세계 공동체 구성원으로 전공자로서 국제적 이슈에 대응할 수 있는 능력		0%
헌신 (Dedication)	상호협력 (Cooperation)	공동의 목적 달성을 위해 타인과 상호협력을 할 수 있는 능력		0%
헌신 (Dedication)	공동체 (Sense of community)	공동체의 구성원으로서 필요한 태도와 윤리의식을 가질 수 있는 능력		0%
능동 (self-Determination)	자기주도 (Self-Managing)	주어진 상황과 문제를 주도적이고 능동적으로 해결할 수 있는 능력		0%
능동 (self-Determination)	지식활용 (Knowledge application)	주어진 상황과 문제에 대해 논리적으로 파악하고 분석할 수 있는 능력	부역량	0%
능동 (self-Determination)	논리적사고 (Logical thinking)	전공관련 지식을 필요에 따라 다양하게 적용하고 활용할 수 있는 능력	주역량	0%
능동 (self-Determination)	의사소통 (Articulation)	대화를 통해 다양한 의견을 조율하고 합		0%

핵심가치	전공역량	역량정의	역량구분	값(%)
n)		의를 이끌어 낼 수 있는 능력		

## Textbook(s) &amp; References

Descrip tion	Title	Author	Publisher
Requi red T extbo ok	Operating System Concepts	Avi Silb erschat z, Peter Baer Ga lvin, Gre g Gagn e	John Wiley & Sons, Inc.
Requi red T extbo ok	인공지능 시대를 위한 운영체제	유혁 외	한빛미디어

## Memo

It is english-language class, so please be familiarize with terms in OS books for yourself.