		Document Code
	Universitas Negeri Surabaya **Faculty of Engineering,** **Bachelor of Information Systems Study Program**	

SEMESTER LEARNING PLAN

Courses		CODE	Course Family	Credit Weight				SEMESTER	Compilation Date
Operating system		5720103053		**T=3**	**P=0**	**ECTS=4.77**		2	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	....	....	I Kadek Dwi Nuryana, S.T., M.Kom.

Learning model	**Project Based Learning**

Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**	
	PLO-5	Have faith in God Almighty and be able to show a religious attitude;
	PLO-24	Mastering concepts and skills in computer programming languages;
	Program Objectives (PO)	
	PO - 1	Students define the main concepts, roles and basic functions of operating systems in computer systems
	PO - 2	Students show the structure of an operating system
	PLO-PO Matrix	

P.O	PLO-5	PLO-24
PO-1		
PO-2		

PO Matrix at the end of each learning stage (Sub-PO)

P.O	Week															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
PO-1																
PO-2																

Short Course Description	This course studies an overview of various operating systems, process and thread management, memory management, storage management, as well as demonstrating the process of implementing these materials in a simple way.

References	**Main :**	
	1. Tanenbaum, S. & Bos, Herbert. 2008. Modern Operating System, Fourth Edition. New Jersey: Pearson Prentice-Hall. 2. Silberschatz, A, et.al. 2013. Operating System Concepts, Ninth Edition. New Jersey: John Wiley & Sons. 3. Love, Robert. 2007. Linux System Programming. California: O 19Reilly Media. 4. Liu, Yukun, et.al. 2011. UNIX Operating System: The Development Tutorial via UNIX Kernel Services. New York: Springer.	
	Supporters:	

Supporting lecturer	Agus Prihanto, S.T., M.Kom. Ronggo Alit, M.M., M.T.

Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)
		Indicator	Criteria & Form	Offline (*offline*)	Online (*online*)		

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1	Students identify the concept of operating systems. Students understand the role and function of operating systems.	1.Students explain the definition of an operating system. 2.Students mention the position of the operating system in the computer organization system. 3.Students explain the role of the operating system. 4.Students mention the functions of the operating system.	**Form of Assessment** : Participatory Activities	Approach: Scientific Model: Cooperative Method: Lecture, Discussion, Presentation 4 X 50	Approach: Scientific Model: Cooperative Method: Lecture, Discussion, Presentation 4 X 50	**Material:** Operating system concepts **References:** *Silberschatz, A, et.al. 2013. Operating System Concepts, Ninth Edition. New Jersey: John Wiley & Sons.*	3%
2	Students understand the use of operating systems well.	1.Students understand the various interfaces in operating systems. 2.Students demonstrate operating systems through several types of interfaces.	**Form of Assessment** : Project Results Assessment / Product Assessment	Model: Discovery Learning Method: Lecture, Question and Answer, Discussion 2 X 50	Model: Discovery Learning Method: Lecture, Question and Answer, Discussion 2 X 50	**Material:** Interfaces in operating systems **References:** *Silberschatz, A, et.al. 2013. Operating System Concepts, Ninth Edition. New Jersey: John Wiley & Sons.*	3%
3	Students understand the concept of system calls in operating systems. Students understand the structure of operating systems.	1.Students explain the concept of system calls in operating systems well. 2.Students mention the structure of an operating system.	**Form of Assessment** : Participatory Activities	Model: Discovery Learning Method: Lecture, Question and Answer, Discussion 2 X 50	Model: Discovery Learning Method: Lecture, Question and Answer, Discussion 2 X 50	**Material:** The concept of system calls **References:** *Tanenbaum, S. & Bos, Herbert. 2008. Modern Operating Systems, Fourth Edition. New Jersey: Pearson Prentice Hall.*	3%
4	Students understand the concept of system calls in operating systems. Students understand the structure of operating systems.	1.Students explain the concept of system calls in operating systems well. 2.Students mention the structure of an operating system.	**Form of Assessment** : Participatory Activities	Model: Discovery Learning Method: Lecture, Question and Answer, Discussion 2 X 50	Model: Discovery Learning Method: Lecture, Question and Answer, Discussion 2 X 50	**Material:** Operating system structure **References:** *Tanenbaum, S. & Bos, Herbert. 2008. Modern Operating Systems, Fourth Edition. New Jersey: Pearson Prentice Hall.*	3%

5	Students evaluate processes in operating systems in general. Students understand process management in operating systems.	1.Students mention the concept of process. 2.Students explain operations in the process. 3.Students explain the scheduling process. 4.Students synthesize and stop the process 5.Students demonstrate the fork() process	**Form of Assessment** : Participatory Activities	Model: Problem Based Learning Method: Lecture, Question and Answer, Discussion 2 X 50	Model: Problem Based Learning Method: Lecture, Question and Answer, Discussion 2 X 50	**Material:** Process management in operating systems **References:** *Tanenbaum, S. & Bos, Herbert. 2008. Modern Operating Systems, Fourth Edition. New Jersey: Pearson Prentice Hall.*	3%
6	Students evaluate processes in operating systems in general. Students understand process management in operating systems.	1.Students mention the concept of process. 2.Students explain operations in the process. 3.Students explain the scheduling process. 4.Students synthesize and stop the process 5.Students demonstrate the fork() process	**Form of Assessment** : Participatory Activities	Model: Problem Based Learning Method: Lecture, Question and Answer, Discussion 2 X 50	Model: Problem Based Learning Method: Lecture, Question and Answer, Discussion 2 X 50	**Material:** Process scheduling **References:** *Tanenbaum, S. & Bos, Herbert. 2008. Modern Operating Systems, Fourth Edition. New Jersey: Pearson Prentice Hall.*	4%
7	Students briefly evaluate threads in the operating system	1.Students mention the concept of threads. 2.Students mention the use of threads. 3.Students show threads in User Space in general. 4.Students show threads in Kernel Space in general.	**Form of Assessment** : Participatory Activities	Model: Discovery learning Method: Lecture, discussion and presentation 4 X 50	Model: Discovery learning Method: Lecture, discussion and presentation 4 X 50	**Material:** Evaluating threads in operating systems **References:** *Tanenbaum, S. & Bos, Herbert. 2008. Modern Operating Systems, Fourth Edition. New Jersey: Pearson Prentice Hall.*	4%
8	Sub-Summative Exam		**Form of Assessment** : Project Results Assessment / Product Assessment	UTS 2 X 50	UTS UTS	**Material:** UTS **Library:**	25%
9	Students are able to apply memory management	1.1. Students apply memory management functions 2.2. Students apply memory classification 3.3. Students apply static and dynamic partitioning strategy methods 4.4. Students are able to apply developments in memory technology	**Form of Assessment** : Participatory Activities	Presentations, discussions, questions and answers and assignments 2 X 50	Presentations, discussions, questions and answers and assignments 2 X 50	**Material:** Memory management **References:** *Liu, Yukun, et.al. 2011. UNIX Operating System: The Development Tutorial via UNIX Kernel Services. New York: Springer.*	3%

10	Students are able to apply I/O device management	1.1. Students are able to apply several classifications of I/O devices 2.2. Students are able to apply interconnections between I/O 3.3. Students apply various I/O management techniques 4.4. Students apply various I/O algorithms 5.5. Students apply developments in I/O device technology.	**Form of Assessment** : Participatory Activities	Presentations, discussions, questions and answers and assignments 2 X 50	Presentations, discussions, questions and answers and assignments 2 X 50	**Material:** I/O device management **References:** *Liu, Yukun, et.al. 2011. UNIX Operating System: The Development Tutorial via UNIX Kernel Services. New York: Springer.*	0%
11	Students are able to apply the file management process	1.1. Students apply problems related to files 2.2. Students are able to differentiate between types of files 3.3. Students are able to apply how to protect files 4.4. Students are able to apply how to share files 5.5. Students apply the directory structure in Windows and Linux 6.6. Students can apply various types of file locking	**Form of Assessment** : Participatory Activities	Presentations, discussions, questions and answers and assignments 2 X 50	Presentations, discussions, questions and answers and assignments 2 X 50	**Material:** File management process **References:** *Liu, Yukun, et.al. 2011. UNIX Operating System: The Development Tutorial via UNIX Kernel Services. New York: Springer.*	3%
12	Students are able to apply storage media processes	1.1. Students explain the development of storage technology 2.2. Students are able to explain the structure of the disk 3.3. Students apply HAS technology 4.4. Students apply NAS technology 5.5. Students apply RAID technology	**Form of Assessment** : Participatory Activities	Presentations, discussions, questions and answers and assignments 2 X 50	Presentations, discussions, questions and answers and assignments 2 X 50	**Material:** Storage media process **References:** *Liu, Yukun, et.al. 2011. UNIX Operating System: The Development Tutorial via UNIX Kernel Services. New York: Springer.*	4%
13	Students are able to apply security systems to operating systems	1.1. Students apply 3 aspects of security 2.2. Students apply network security models 3.3. Students apply cryptography and steganography 4.4. Students apply various viruses and their variants.	**Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Presentations, discussions, questions and answers and assignments 2 X 50	Presentations, discussions, questions and answers and assignments 2 X 50	**Material:** Security systems on operating systems **References:** *Love, Robert. 2007. Linux System Programming. California: O19Reilly Media.*	4%

14	Students are able to apply virtualization technology	1.1. Students explain the definition of virtualization 2.2. Students explain the difference between physical vs virtual architecture 3.3. Students explain the relationship between Virtual Machine HostOS and Guest OS 4.4. Students apply the use of VirtualBox 5.5. Students apply the use of VmWare Workstation	**Form of Assessment** : Participatory Activities	Presentations, discussions, questions and answers and assignments 2 X 50	Presentations, discussions, questions and answers and assignments 2 X 50	**Material:** Virtualization technology **References:** *Liu, Yukun, et.al. 2011. UNIX Operating System: The Development Tutorial via UNIX Kernel Services. New York: Springer.*	0%
15	Students are able to apply virtualization technology	1.1. Students explain the definition of virtualization 2.2. Students explain the difference between physical vs virtual architecture 3.3. Students explain the relationship between Virtual Machine HostOS and Guest OS 4.4. Students apply the use of VirtualBox 5.5. Students apply the use of VmWare Workstation	**Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	Presentations, discussions, questions and answers and assignments 2 X 50	Presentations, discussions, questions and answers and assignments 2 X 50	**Material:** Virtualization technology **Reference:** *Love, Robert. 2007. Linux System Programming. California: O19Reilly Media.*	4%
16	UAS		**Form of Assessment** : Project Results Assessment / Product Assessment	UAS	UAS	**Material:** UAS **Literature:**	25%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	34%
2.	Project Results Assessment / Product Assessment	57%
		91%

Notes

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.

5. **Indicators for assessing** ability in the process and student learning outcomes are specific and measurable statements that identify the ability or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.