Operating System

Course Code	Student Workload	Credits	Semester	Frequency	Duration
CIF62002	120 hours	6 ECTS (4.5 for theory and 1.5 for practical work)	even semesters	each even-semester	16 meetings

1	Types of courses	contact hours	independent study	class size
	compulsory	84 hours	36 hours	40 students

2 Prerequisites for participation

Have completed Computer Architecture and Organization course

3 Learning outcomes

IF-ILO-2

Graduates are able to think scientifically, work collaboratively, hold professional values, and are able to adapt in various working environments.

IF-ILO-3

Graduates are able to develop professional careers in the field of computer science based on quality aspects, data-based decision making, be responsible, and make continuous improvements.

IF-ILO-5

Mastering the structure and how the computer systems work both in general and in detail at various levels of abstraction and how the interaction between the computer system and its environment.

IF-ILO-7

Mastering the theoretical concept and principles of computer science, especially in the aspect of algorithms, programming, intelligent systems, information management, parallel and distributed computing, information security, human-computer interaction, software engineering, and fundamentals of computer systems and networks.

4 Subject aims

Students are able to explain the definition, components, and working principles of operating systems

Students are able to explain services and operating system interfaces; system calls, operating system design and structure; as well as system boot

	Students are able to explain the steps of process execution, process scheduling, process operations, and communication between processes Students are able to explain the types of multithreading models, thread libraries, and threading issues Students are able to explain problems in the process and solutions to overcome these problems by synchronizing processes; as well as process monitoring Students are able to explain scheduling criteria and algorithms; multiprocessor and thread scheduling Students are able to explain the system model; deadlock handling methods; detect deadlocks; prevent deadlocks; and avoid deadlocks Students are able to explain the working principle of main memory, swapping techniques, and contiguous memory allocation Students are able to explain the mechanism and structure of the paging table, segmentation, and virtual memory Students are able to explain the structure and attachments, as well as scheduling on disk Students are able to explain disk management, swap-space, and RAID Students are able to explain the concept of files, methods and permissions, as well as the directory structure Students are able to explain file system mounting, file sharing, and protection Students are able to explain the I/O system; I/O hardware; application I/O interfaces; kernel I/O, and performance on I/O
5	**Teaching methods** lectures, case study, class discussion, presentation, practice, practical work
6	**Assessment methods** assignment, mid-term examination, end-term examination, project evaluation, practical-skill assessment
7	**This module is used in the following degree programs as well**
8	**Responsibility for module**
9	**Other information** 1. Abraham Silberschatz, Peter Bear Galvin, Greg Gagne “Operating System Concept, 9th Edition”, Jhon Wiley & Son, Inc, 2012. 2. Andrew S Tanembaum, Herbert Bos, “Modern Operating System,- Global Edition”, 2015. 3. Operating System Practicum Module, Faculty of Computer Science, Universitas Brawijaya.