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|  | **UNIVERSITAS NEGERI PADANG****FACULTY OF ENGINEERING****ELECTRONIC ENGINEERING DEPARTMENT** | **Document Code** |
| **SEMESTER LEARNING PLAN** |
| **COURSES** | **Code** | **Family of Courses** | **Credits** | **SEMESTER** | **Compilation Date** |
| **Operating system** | TIK 1.61.3305 | Study Program Compulsory Courses | 3 credits (theory) | 3 | July 2017 |
| **AUTHORIZATION** | **Developer Lecturer** | **Coordinator** | **Head of Study Program** |
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| **Learning Outcomes (CP)** | **CPL-PRODI**  |  |
| CP - S1 | Believe in God Almighty and be able to show a religious attitude |
| CP - S9 | Demonstrate an attitude of responsibility for work in their field of expertise independently |
| CP - PP6 | Understand the basic concepts of mathematics, electrical and electronic science in the field of computers |
| CP - KU5 | able to make decisions appropriately in the context of problem-solving in their area of expertise, based on the results of information and data analysis. |
| CP - KK6 | Ability to master the basic Python programming, Gauss computation method and LU Decomposition method computation |
| **CPMK** |  |
| CPMK1 | Able to describe the services provided in the operating system |
| CPMK2 | Able to differentiate between single thread and multi-thread |
| CPMK3 | Identify some scheduling algorithms in CPU realtime |
| CPMK4 | Be able to explain basic concepts of hardware I / O and I / O interfaces |
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| **Short Description MK** | This course studies and masters systems that function to regulate and supervise the use of hardware by various application programs and users. The operating system functions to make the computer condition so that it can run the program properly. |
| **Study Materials (Learning materials)** | 1. Computer system organization
2. Computer system architecture
3. Operating system services
4. *System calls and their types*
5. *Operating system structure*
6. *Boot system*
7. Scheduling
8. Communication in a process: shared memory vs messaging passing
9. Threads
10. Process synchronization
11. Scheduling algorithm
12. *Deadlock*
13. Main memory concept, segmentation vs paging
14. Secondary storage, files, directories
 |
| **References** | **Main:** |  |
| 1. Dhamdhere, DM, 2006, Operating Systems: A Concept-Based Approach (second ed.), New York, McGraw-Hill Companies, Inc. 2. Hariningsih, SP., 2003, Operating Systems (first edition), Yogyakarta, Graha Ilmu. |
| **Supporters:** |  |
| * + - 1. Silberschatz, Galvin and Gagne, “Operating System Concep Essentials”, John Wiley & Sons 2011. ISBN 978-0470
			2. Stallings, William, 2012, Operating System: Internals and Design Principles (seventh ed.), New Jersey, Prentice Hall, Inc.
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| **Learning Media** | **Software:** | **Hardware :** |
| ppt, word app | LCD & Projector |
| **Supporting lecturer** | Ahmaddul Hadi, M.Kom |
| **Requirements course** | - |
| **Lectures To-** |  **Sub-CPMK****(as the final expected ability)** | **Assessment Indicators** | **Criteria & Form of Assessment** | **Forms, Learning Methods & Assignments** **[ Estimated time]** | **Learning materials****[Library / Learning Resources]** | **Rating Weight (%)** |
| **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
| 1 | Students can explain the basic concepts of operating systems, computer system organization and computer system architecture  | 1. The accuracy of describing the operating system
2. Accuracy describes the organization of the operating system
3. Accuracy describes the computer system architecture
 | Using the Assessment Rubric | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**Basic Concepts & System Operation Computer**[BT: 1x (3x60 ")]** | Operating system, computer system organization and computer system architecture |  |
| 2 | Students can describe the services provided in the operating system | 1. Accuracy in explaining Operating system services
2. Accuracy in explaining system calls and their types
3. Accuracy describes the structure of the operating system
4. Accuracy describes the Boot system
 | Using the Assessment Rubric | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**Operation services system**[BT: 1x (3x60 ")]** | Operating system services*System calls and their types* |  |
| 3 | Students can describe the control block process and its operations | 1. Accuracy explained the concept of the scheduling process
2. The accuracy of describing communication in a process: shared memory vs message passing system
 | Using the Assessment Rubric | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**Block control **[BT: 1x (3x60 ")]** | control block process |  |
| 4 | Students can describe the meaning of threads, single thread and multi-thread | 1. Accuracy explained *Threads*
2. Accuracy describes Single Thread and Multi Threads
3. Accuracy describes the multi reading model
4. Accuracy in explaining threading issues.
 | Using the Assessment Rubric | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**Thread, single thread, multi-thread**[BT: 2x (3x60 ")]** | Threads, single thread and multi-thread |  |
| 5 | Students can understand the concept of process synchronization, understand mutex and semaphore | 1. Accuracy explained process synchronization
2. Accuracy explains Mutex Lock
3. Accuracy explains Semaphore
 | Using the Assessment Rubric | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**Process synchronization**[BT: 1x (3x60 ")]** | Process synchronization, understanding mutex and semaphore |  |
| 6 | Students can explain the basic concepts of CPU scheduling, define several CPU scheduling algorithms | 1. Accuracy explains the basic concepts of scheduling
2. Accuracy describes the criteria for scheduling
3. Accuracy describes FCFS, SJF, Priority, Round-Robin scheduling
 | Using the Assessment Rubric | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**CPU scheduling and algorithms**[BT: 1x (3x60 ")]** | CPU scheduling, |  |
| 7 | Students can explain the multiprocessor scheduling algorithm | 1. Accuracy describes multiprocessor scheduling
2. Accuracy describes CPU Scheduling real-time scheduling
 |  | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**Multiprocessor scheduling algorithm**[BT: 1x (3x60 ")]** | Scheduling algorithm in multiprocessor |  |
| **8** | **UTS / Mid Semester Examination** |  |
| 9 | Students can understand deadlocks and their characteristics, algorithms avoid deadlocks | 1. Accuracy explained Deadlock characteristics
2. The accuracy of explaining Deadlock prevention, mutex, hold and wait, no preemption
3. Appropriately describes Deadlock avoidance: resource allocation graph
4. Accuracy describes deadlock detection
 | Using the Assessment Rubric | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**Deadlock**[BT: 1x (3x60 ")]** | Deadlock |  |
| 10 | Students can explain the basic concepts of main memory (main memory) | 1. Accuracy explained main memory concept
2. Accuracy describes memory allocation
3. Accuracy describes segmentation and paging
 | Using the Assessment Rubric | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**Main memory**[BT: 1x (3x60 ")]** | Main memory (main memory) |  |
| 11 | Students understand and can define the types of secondary storage media | 1. Accuracy explained types of secondary storage media types
2. Accuracy describes the disk structure
3. Accuracy describes disk management
 | Using the Assessment Rubric | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**Type of secondary storage media**[BT: 1x (3x60 ")]** | Secondary storage media |  |
| 12 | Students understand the concept of files in an operating system, file access methods, mounting, sharing, protection | 1. Accuracy explained draft file
2. The accuracy of describing the file access method
 | Using the Assessment Rubric | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**file (file) **[BT: 1x (3x60 ")]** | Files in an operating system, file access methods, mounting, sharing, protection |  |
| 13 | Students understand the basic concepts of hardware I / O and I / O interfaces | 1. Accuracy describes hardware I / O
2. Accuracy describes the I / O interface
3. Accuracy describes the I / O kernel
 |  | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**basic I / O hardware and I / O interfaces**[BT: 1x (3x60 ")]** | Basic I / O hardware and I / O interfaces |  |
| 14 | Students understand protection in an operating system | 1. Accuracy explains the concept of protection
2. Accuracy in explaining security problems
3. The accuracy of describing the thread program
 |  | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**Operating system protection**[BT: 1x (3x60 ")]** | Operating system protection |  |
| 15 | Students understand the technical presentations of the 9-14 meeting | 1. Accuracy of explaining review material 9-14
 |  | **Lecture**Presentation**[TM: 1x (3x50 ”)]****Independent****[BM: 1x (3x60 ”)]****Task 1**Basic Concepts of the operating system**[BT: 1x (3x60 ")]** | meeting 9-14 |  |
| **16** | **UAS / Semester Final Examination: Evaluation which is intended to determine the final achievement of student learning outcomes** |  |

**Note**:

1. Learning Outcomes of Graduates of PRODI (CPL-PRODI) are abilities possessed by each PRODI graduate which is an internalization of attitudes, mastery of knowledge and skills by the level of the study program obtained through the learning process.
2. The CPL that is charged on the course is some of the learning outcomes of the study program graduates (CPL-PRODI) which are used for the formation/development of a course which consists of aspects of attitude, general skills, special skills and knowledge.
3. CP Course (CPMK) is an ability that is described specifically from the CPL that is charged to a course and is specific to the study material or learning material for the course.
4. Subject Sub-CP (Sub-CPMK) is an ability that is described specifically from the CPMK which can be measured or observed and is the final ability planned at each learning stage, and is specific to the subject matter learning material.
5. Assessment criteria are benchmarks that are used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that the assessment is consistent and unbiased. The criteria can be either quantitative or qualitative.
6. Indicators of ability assessment 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.