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|  | | **UNIVERSITAS NEGERI PADANG**  **FACULTY OF ENGINEERING**  **ELECTRONIC DEPARTMENT**  **INFORMATIC EDUCATION STUDY PROGRAM** | | | | | | | | | | **Document Code** | | |
| **SEMESTER LEARNING PLAN (SLP)** | | | | | | | | | | | | | | |
| **COURSES** | | | | | | **CODE** | | **Course Group** | **Credit Point(s)** | | **SEMESTER** | | **Date Of Creation** | |
| **Organisasi dan Arsitektur Komputer**  **(Computer Architecture and Organization)** | | | | | | TIK1.61.2302 | | Study Program Compulsory Courses | 3 credits (theory) | | II | | July 2017 | |
| **AUTHORIZATION** | | | | | | **Lecturer** | | | **Course Coordinator** | | **Coordinator of Study Program** | | | |
| **Dr. Dedy Irfan, S.Pd, M.Kom**  **NIP. 197604082005011002** | | | **Dr. Dedy Irfan, S.Pd, M.Kom**  **NIP. 197604082005011002** | | **Ahmaddul Hadi, S.Pd., M.Kom.**  **NIP. 197612092005011003** | | | |
| **Learning Outcomes (LO)** | | | **PLO** | | |  | | | | | | | | |
| PLO-S1 | Have faith in God Almighty and able to show a religious attitude. | | | | | | | | | | |
| PLO-S9 | Demonstrate an attitude of responsibility for work in their field of expertise independently | | | | | | | | | | |
| PLO-P6 | Understand the basic concepts of mathematics, electrical and electronic science in the field of computers | | | | | | | | | | |
| PLO-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. | | | | | | | | | | |
| PLO-KK6 | Ability to master basic mathematics, electrical and electronic science concepts for the development of computer systems | | | | | | | | | | |
| **CO** | | | |  | | | | | | | |
| CO-1 | Understand and explain the concepts regarding computer architecture and organization, the structure and functions of computer organizations in general, and the history of computer development. | | | | | | | | | | |
| CO-2 | Understand A Top Level View of Computer Function & Interconnection or basic computer components that refer to von Neumann Architecture, computer functions, interconnection structures in memory, I / O modules, and CPU, bus interconnection, PCI. | | | | | | | | | | |
| CO-3 | Understand and explain the characteristics of a computer memory system and its hierarchy. | | | | | | | | | | |
| CO-4 | Understand and explain about Input & Output: External Devices, I / O Modules, Programmed I / O, Interrupt Driven I / O, Direct Memory Access, Direct Cache Access, I / O Channels & Processors. | | | | | | | | | | |
| CO-5 | Understand and explain about Computer Arithmetic: Arithmetic Logic Unit, various functions and arithmetic in an ALU, understand logically about the work process of a CPU. | | | | | | | | | | |
| **Course Description** | | | This course studies the concepts of Computer Architecture and Organization, starting with Basic Concepts & Computer Evolution, A Top Level View Of Computer Function & Interconnection, Computer Memory System & Cache Memory, Internal Memory: DRAM, SRAM, DDR RAM, Flash Memory, External Memory: Magnetic Disk, RAID, SSD, Optical Memory, Magnetic Tape, Input & Output: External Devices, I / O Modules, Programmed I / O, Interrupt Driven I / O, Direct Memory Access, Direct Cache Access, I / O Channels & Processors, Operating System Support: Scheduling, Memory Management, Number System: Binary, Decimal, Hexadecimal, Converter, Computer Arithmetic: Arithmetic Logic Unit, Instruction Sets: Characteristics & Functions, Instruction Sets: Addressing Modes & Formats, Processor Structure & Functions: Processor &Register Organization, Instruction Cycle, Instruction Pipelining, Reduced Instruction Set Computers, RISC, CISC. | | | | | | | | | | | |
| **Course Matter** | | | 1. Introduction: Computer Architecture & Organization 2. Basic Concepts & Computer Evolution 3. A Top Level View of Computer Function & Interconnection 4. Computer Memory System & Cache Memory 5. Internal Memory: DRAM, SRAM, DDR RAM, Flash Memory 6. External Memory: Magnetic Disk, RAID, SSD, Optical Memory, Magnetic Tape 7. Input & Output: External Devices, I / O Modules, Programmed I / O, Interrupt Driven I / O, Direct Memory Access, Direct Cache Access, I / O Channels & Processors 8. Operating System Support: Scheduling, Memory Management 9. Number System: Binary, Decimal, Hexadecimal, Converter 10. Computer Arithmetic: Arithmetic Logic Union 11. Instruction Sets: Characteristics & Functions 12. Instruction Sets: Addressing Modes & Formats 13. Processor Structure & Functions: Processor & Register Organization, Instruction Cycle, Instruction Pipelining 14. Reduced Instruction Set Computers, RISC, CISC | | | | | | | | | | | |
| **References** | | | **Main:** | | |  | | | | | | | | |
| 1. William Stalling. 2016. Computer Organization and Architecture 10th Edition. Pearson.   Abdurohman, Maman. 2017. Organisasi & Arsitektur Komputer. Informatika: Bandung. | | | | | | | | | | | |
| **Learning Media** | | | **Software:** | | | | | | **Hardware :** | | | | | |
| Personal Computers, Papers, PowerPoint | | | | | | LCD & Projector | | | | | |
| **Lecturer** | | | **Dr. Dedy Irfan, S.Pd, M.Kom**  **NIP. 197604082005011002** | | | | | | | | | | | |
| **Prerequisites** | | | - | | | | | | | | | | | |
| **Weeks-** | **Sub-CO**  **(Expected Final Ability in each learning stage)** | | | | **Assessment Indicator** | | | **Assessment Criteria** | **Learning Method, Students’ Learning Experience**  **[Time Allocation]** | **Learning Material [Topic from Reference]** | | | | **Score (%)** |
| **(1)** | **(2)** | | | | **(3)** | | | **(4)** | **(5)** | **(6)** | | | | **(7)** |
| 1-2 | Understand and explain the concepts regarding computer architecture and organization, the structure and functions of computer organizations in general, and the history of computer development. | | | | 1. Accurately explains definition conceptual equation regarding computer architecture and organization 2. Describe and describe the structure and functions of computer organizations in general 3. Describe and describe, and the history of computer development. 4. Describe and describe computer performance | | | **Criteria**   1. Lecture 2. Discussion 3. Presentation | **Lecture**  Presentation  **[TM: 2x (3x50 ")]**  **Independent**  **[BM: 2x (3x60 ")]**  **Task 1**  Basic Concepts & Computer Evolution  **[BT: 2x (3x60 ")]** | 1. Introduction and Lecture Contract 2. Introduction to Computer Architecture and Organization 3. Basic Concepts & Computer Evolution   **[1], [2]** | | | | **15%** |
| 3-7 | Understand and explain about a Top Level View of Computer Function & Interconnection or basic computer components that refer to von Neumann Architecture, computer functions, interconnection structures in memory, I / O Modules, and CPU, bus interconnection, PCI, characteristics of computer memory systems and its hierarchy, the concept of semiconductor main memory (types, categories and properties), regarding cache memory. | | | | 1. Accuracy in explaining A Top Level View of Computer Function & Interconnection 2. Accuracy describes the basic components of a computer that refers to von Neumann Architecture 3. Its breadth and sharpness describe the functions of a computer 4. The accuracy determines the bus interconnection 5. Accuracy explains main memory concepts | | | **Criteria:**   1. Lecture 2. Discussion 3. Presentation | **Lecture**  Presentation  **[TM: 5x (3x50 ")]**  **Independent**  **[BM: 5x (3x60 ")]**  **Task-2**  *A Top Level View of Computer Function & Interconnection*  **[BT: 1x (3x60 ")]**  **Task-3**  *CPU Structure*  **[BT: 2x (3x60 ")]**  **Task-4**  *Memory Concepts and Memory Hierarchy*  **[BT: 2x (3x60 ")]** | 1. Concept support for computer functions and interconnection 2. Computer memory 3. Memory Cache 4. Internal Memory   **[1], [2]** | | | | **35%** |
| **8** | **Midterm Midterm Exam: Formative evaluation that is intended to improve the learning process based on the assessment that has been carried out** | | | | | | | | | | | | | |
| 9-10 | Understand and explain about Operating System Support: Scheduling, Memory Management | | | | 1. Accuracy describes the operating system concept 2. Accuracy describes memory management | | | **Criteria:**   1. Lecture 2. Discussion 3. Presentation | **Lecture**  Presentation  **[TM: 2x (3x50 ")]**  **Independent**  **[BM: 2x (3x60 ")]**  **Task-5**:  *Operating System Support: Scheduling, Memory Management*  **[BT: 2x (3x60 ")]** | 1. Operating system 2. Memory Management 3. Scheduling   **[1], [2]** | | | | **15%** |
| 11-12 | Understand and explain about Number System: Binary, Decimal, Hexadecimal, Converter. | | | | 1. Accuracy describes the number system 2. Accuracy describes binary numbers 3. Accuracy describes decimal numbers 4. Accuracy describes hexadecimal numbers and converters | | | **Criteria:**   1. Lecture 2. Discussion 3. Presentation | **Lecture**  Presentation  **[TM: 2x (3x50 ")]**  **Independent**  **[BM: 2x (3x60 ")]**  **Task-6**:  Number System  **[BT: 2x (3x60 ")]** | 1. Derivative concept 2. Derivative algebraic functions 3. Derivative transcendent function 4. Multivariable function derivatives   **[1], [2]** | | | | **15%** |
| 13-15 | Understand and explain about Processor Structure & Functions: Processor & Register Organization, Instruction Cycle, Instruction Pipelining | | | | 1. Accuracy describes the structure of the CPU 2. Accuracy describes CPU function 3. The accuracy of describing the organization of the register 4. The accuracy of explaining the Instruction Cycle 5. Accuracy explains about Instruction Pipelining | | | **Criteria:**   1. Lecture 2. Discussion 3. Presentation | **Lecture**  Presentation  **[TM: 3x (3x50 ")]**  **Independent**  **[BM: 3x (3x60 ")]**  **Task-7**:  Register Organization  **[BT: 1x (3x60 ")]**  **Task-8:**  Instruction Cycle & Pipelining  **[BT: 2x (3x60 ")]** | 1. CPU structure and function 2. Computer Organization 3. Instruction Cycle 4. Instruction Pipelining   **[1], [2]** | | | | **20%** |
| **16** | **UAS / Semester Final Examination: Evaluation which is intended to determine the final achievement of student learning outcomes** | | | | | | | | | | | | | |