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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** |
| **Data Structure** | TIK1.61.2301 | Compulsory Courses of the Study Program | 3 credits (theory) | II | July 2017 |
| **AUTHORIZATION** | **Lecturer** | **Course Coordinator** | **Coordinator of Study Program** |
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| **Learning Outcomes (LO)** | **CPL-PRODI**  |  |
| 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-PP6 | 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 concept of algorithms, data structures, programming languages, the use of IDEs, and data structures in computers |
| CO-2 | Understand programming and data structures, create simple programs using data structure concepts |
| **Course Description** | This course is a course that teaches students to be able to solve programming problems with the right algorithms using the correct data structures. |
| **Course Matter** | 1. Introduction: Programming Algorithms
2. Array, Pointer, & Structure
3. Single Linked List
4. Double Linked List
5. Multi Linked List
6. Stack
7. Queue
8. Recursion
9. Sorting: Bubble Sort, Insertion Sort, Selection Sort
10. Sorting: Shell Sort, Quick Sort, Merge Sort
11. Searching: Linear Search & Binary Search
12. Tree: Binary Tree, Binary Search Tree, AVL Tree
13. Graphs: BFS Algorithm & DFS Algorithm
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| **Reference** | **Main:** |  |
| 1. Cipta Ramadhani. 2015. Dasar Algoritma & Struktur Data dengan Bahasa Java. Yogyakarta: ANDI.2. Denny Kurniadi. 2017. Pemrograman Berorientasi Objek dengan Bahasa Pemrograman Java. Padang: UNP.3. Wu, C. Thomas. 2010. An Introduction to Object–Oriented Programming with Java 5th Edition. C. USA: McGraw – Hill Education.4. Nemeyer, Patrick and Luck, Daniel. 2013. Learning Java 4th Edition.O’Reilly5. Sharan, Kishori. 2014. Beginning Java 8 Fundamentals. Apress.6. Schildt, Herbert. 2014. Java: The Complete Reference 9th Edition. McGraw – Hill Education. |
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| **Media** | **Software:** | **Hardware :** |
| Personal Computers, Papers, Powerpoint | LCD & Projector |
| **Lecturer**  | - |
| **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 basic concepts of Algorithms, Data Structures, and the use of IDEs. | 1. Accuracy describes algorithms, data structure concepts
2. Explain and describe EDI and how it is used.
 | **Criteria:**1. Responsiveness
2. Discussion Material
3. Practice
4. Project Report
 | **Lecture**Presentation**[TM: 2x (3x50 ")]****Independent****[BM: 2x (3x60 ")]****Task 1**Algorithms, datastructures and IDE.**[BT: 2x (3x60 ")]** | Algorithms, Data Structures, and IDEs.**[1], [2], [3], [4], [5], [6]** | **15%** |
| 3-7 | Understand and explain Arrays, Pointers, & Structures, Single Link List, Double Link List, and Stack in C programming using the IDE. | 1. Accuracy describes arrays
2. Accuracy describes pointers.
3. The breadth and sharpness describe the structures
4. The accuracy in implementing single link list, double link list, and stack
 | **Criteria:**1. Responsiveness
2. Discussion Material
3. Practice
4. Task Report
 | **Lecture**Presentation**[TM: 5x (3x50 ")]****Independent****[BM: 5x (3x60 ")]****Task-2**Arrays, Pointers, & Structures**[BT: 2x (3x60 ")]****Task-3**Single Link List, Double Link List**[BT: 2x (3x60 ")]****Task-4**Stack**[BT: 1x (3x60 ")]** | *Arrays, Pointers, & Structures***[1], [2], [3], [4], [5], [6]** | **35%** |
| **8** | **Mid-Term Mid-Term 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 Queue in C programming using IDE. | 1. Accuracy describes the operating system concept
2. Accuracy describes memory management
 | **Criteria:**1. Responsiveness
2. Discussion Material
3. Practice
4. Task Report
 | **Lecture**Presentation**[TM: 2x (3x50 ")]****Independent****[BM: 2x (3x60 ")]****Task-5***Queue***[BT: 2x (3x60 ")]** | Queue**[1], [2], [3], [4], [5], [6]** | **15%** |
| 11-12 | Understand and explain about Sorting: Bubble Sort, Insertion Sort, Selection Sort in C programming using IDE. | 1. Accuracy describes about Sorting
2. Accuracy of explaining Bubble Sort
3. Accuracy of explaining Insertion Sort
4. Accuracy describes Selection Sort
 | **Criteria:**1. Responsiveness
2. Discussion Material
3. Practice
4. Task Report
 | **Lecture**Presentation**[TM: 2x (3x50 ")]****Independent****[BM: 2x (3x60 ")]****Task-6**Sorting: Bubble Sort, Insertion Sort, Selection Sort **[BT: 2x (3x60 ")]** | Sorting: Bubble Sort, Insertion Sort, Selection Sort **[1], [2], [3], [4], [5], [6]** | **15%** |
| 13-15 | Understand and explain about Searching: Linear Search & Binary Search in C programming using IDE. | 1. The accuracy of explaining searching
2. Accuracy describes linear search
3. The accuracy of explaining binary search
4. Accuracy describes the concept of BFS Algorithm & DFS Algorithm
 | **Criteria:**1. Responsiveness
2. Discussion Material
3. Practice
4. Task Report
 | **Lecture**Presentation**[TM: 3x (3x50 ")]****Independent****[BM: 3x (3x60 ")]****Task-7***Searching: Linear Search & Binary Search***[BT: 3x (3x60 ”)]** | Searching: Linear Search & Binary Search, BFS Algorithm & DFS Algorithm**[1], [2], [3], [4], [5], [6****]** | **20%** |
| **16** | **UAS / Semester Final Examination: Evaluation which is intended to determine the final achievement of student learning outcomes** |