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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** | | | |
| **Drs. Denny Kurniadi, M.Kom**  **NIP. 196306061989031001** | | | **Drs. Denny Kurniadi, M.Kom**  **NIP. 196306061989031001** | | **Ahmaddul Hadi, S.Pd., M.Kom.**  **NIP. 197612092005011003** | | | |
| **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 | | | | | | | | | | | |
| **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’Reilly  5. 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** | | | | | | | | | | | | | |