|  |  |  |
| --- | --- | --- |
| Logo UNP.png | **UNIVERSITAS NEGERI PADANG****ENGINEERING FACULTY****ELECTRONIC DEPARTMENT****INFORMATIC EDUCATION STUDY PROGRAM** | **Document Code** |
| **STUDY LEARNING PLAN (SLP)** |
| **Course** | **Code** | **Course Group** | **Credit Points (CP)** | **Semester** | **Date of Creation** |
| **Network Based Programming** | TIK1.61.5305 | Compulsory Course of the Study Program | 2 CP (Theory) | 5 | July 2017 |
| **AUTHORIZED** | **Course Lecturers** | **Course Coordinator** | **Head of Study Program** |
| **Yeka Henriyani, M.Kom****NIP.** **198405202010122003** | (Jika ada)Tanda tangan**Yeka Henriyani, M.Kom****NIP.** **198405202010122003** | Tanda tangan**Ahmaddul Hadi, S.Pd, M.Kom****NIP. 197612092005011003** |
| **Learning Outcomes** | **Program Learning Outcomes (PLO)** |  |
| PLO-S1 | Have faith in God Almighty and able to show a religious attitude. |
| PLO-S4 | Contribute to improving the value of life in society, nation, state, and civilization based on Pancasila. |
| PLO-S9 | Demonstrate an attitude of responsibility for work in their field of expertise independently |
| PLO-P16 | Knowing producing engineering models and products in the field of computer networks, software, multimedia products for various needs of information systems in society as individuals and groups.  |
| PLO-KU1 | Able to apply logical, critical, systematic, and innovative thinking in the context of developing or implementing science and technology pay attention to and apply humanities values ​​by their field of expertise |
| PLO-KU2 | Have the ability to show independent, quality, and measurable performance. |
| PLO-KU9 | Capable of documenting, storing, securing, and recovering data to ensure validity and prevent plagiarism. |
| PLO-KK14 | The ability to engineer software for various application needs to keep up with the latest developments in software engineering methods |
| **Course Outcomes (CO)** |  |
| CO1 | Students can understand the concept of data transmission in network-based applications with various existing transmissions such as TCP and UDP, Unicast, Broadcast, and multicast. [KU9, KK14, P16] |
| CO2 | Able to apply network programming to existing protocols and design communication protocols for network-based applications. (P16, KU2, KU9, KK14); |
| CO3 | Able to explain various stages in designing a computer network-based application. [P16, KK14]; |
| CO4 | Able to collect, process data, and interpret the results logically and systematically to avoid plagiarism responsibly. (S9, KU1,KU9); |
| CO5 | Able to compile software and present it with independent, quality, and measurable performance. (S9, KU2, KU9). |
| **Course Description** | In this course, students learn how to make applications that can communicate with other applications on a computer network using socket programming. Also, students learn how to communicate with applications. |
| **Course Materials** | 1. Networking and Terminology, Protocol, Network Topology, DNS, HTTP
2. Concept and Implementation of Routing, Concept, and Implementation of NAT, Concept, and Implementation of Proxy, Concept, and Implementation of VLAN
3. TCP Socket Programming
4. TCP Client-Server, Multiplexing, Socket Option
5. UDP Socket, UDP Advanced Socket Programming.
6. DBMS connection in Java
7. Managing I/O Streams with a DBMS
8. Implementation of network programming, Webserver, DNS server, Domain, Hosting, FTP server
9. DBA Networking, Lock Transaction, Account Privileges, Network monitoring, SNMP
10. Concept of network security, Concept and implementation of a firewall
 |
| **Reading List** | **Utama :**1. Darni, R. (2019). *Pemrograman Jaringan dengan Java.* UNP Press
2. Hamzah, Amir, “Pemrograman Java”, 2012, AKPRIND PRESS Yogyakarta
3. Dokumentasi Java API, online reference pada: <http://docs.oracle.com/javase/7/docs/api/>
4. Jennifer Nieders Robbins, Learning Web Designs, Fourth Edition, 2012, O'Really
5. Kurniawan, Agus. (2012). Pemrograman Jaringan dengan Java (+CD). Andi Publisher.
6. Steve Prettyman, Learn PHP 7, 2016, Apress
7. W. R. Stevens, *Unix Network Programming 2/e*, Prentice Hall PTR, January 1998
8. William Stalling, *Komunikasi Data dan Komputer*, Salemba Teknika, 2001
 |
|  |
| **Learning Media** | **Software:** | **Hardware:** |
| e-modul IMK/ e-Learning2 UNP/Zoom | LCD & Projector |
| **Course Lectures** | **Yeka Henriyani, M.Kom** |
| **Week** | **Sub-Course Outcomes****(Expected Final Ability in each Learning Stage)** | **Assessment Indicators** | **Criteria & Assessment Form** | **Learning Method & Assignment** **[Estimated time]** | **Learning Content & Course Materials [Reading List)** | **Score****(%)** |
| **(1)** | **(2)** | **(3)** | **(4)** | **(5)** | **(6)** | **(7)** |
| 1 | Students can understand lecture contracts, RPS and able to understand the basics of Internet networks | 1. Describe how to design a network architecture
2. Describe the tools used
 | **Criteria :**1. Quiz Assessment
2. Task Assessment
3. Participation in classroom
4. *Problem Based Learning*
5. Network application demonstration
 | * **Lectures:**

Practicum**[TM: 1x (2x 100’’)]*** **Assignment dan Report:**

Problem-solving about Networking and Terminology **[BT+BM: (1)x(2x70”)]** | 1. RPS
2. Lecture contract
3. Networking & Terminology
4. Protocol
5. Network topology
6. DNS
7. HTTP

**Source : [1] ,[2]** | **5%** |
| 2, 3 | Students can understand the concept and implementation of Routing. | 1. Accuracy describes the concepts of routing, NAT, proxy, VLAN
2. The accuracy of the configuration of routing, NAT, proxy, VLAN
 | **Criteria :**1. Quiz Assessment
2. Task Assessment
3. Participation in classroom
4. *Problem Based Learning*
5. Network application demonstration
 | * **Lectures:**

Practicum**[TM: 2x (2x 100’’)]*** **Assignment dan Report:**

Problem-solving about Routing, NAT and proxy **[BT+BM: (2)x(2 x 70”)]** | 1. Concept and Implementation of Routing
2. Introduction
3. Datalink Socket Address Structure
4. Reading and Writing
5. Concept and Implementation of NAT
6. Concept and Implementation of Proxy
7. Concept and Implementation of VLAN

**Source : [1] ,[3]** | **15%** |
| 4 | Students can understand about TCP Socket | 1. Explains the concept of TCP socket programming
2. Practicum TCP socket programming
 | **Criteria :**1. Quiz Assessment
2. Task Assessment
3. Participation in classroom
4. *Problem Based Learning*
5. Network application demonstration
 | * **Lectures:**

Practicum**[TM: 1x (2x 100’’)]*** **Assignment dan Report:**

Problem-solving about TCP Socket Programming**[BT+BM: (1)x(2x70”)]** | 1. TCP Socket Programming
2. Introduction to TCP Socket Programming
3. Socket Function
4. Connect Function
5. Bind Function
6. Listen Function
7. Accept Function

**Source : [ 1], [2]** | **5%** |
| 5 | Students can understand TCP Client-Server, Multiplexing, and Socket Options. | 1. Accuracy explains the concept of TCP client-server, multiplexing, socket option
2. Ability to create a TCP client-server program (Chat Application)
 | **Criteria :**1. Quiz Assessment
2. Task Assessment
3. Participation in classroom
4. *Problem Based Learning*
5. Network application demonstration
 | * **Lectures:**

Practicum**[TM: 1x (2x 100’’)]*** **Assignment dan Report:**

Problem-solving about TCP Client Server, Multiplexing and Socket Option**[BT+BM: (1)x(2x70”)]** | 1. TCP Client Server
2. Introduction
3. TCP Echo Server: main Function
4. TCP Echo Server: str\_echo Function
5. TCP Echo Client: main Function
6. TCP Echo Client: str\_cli Function
7. Multiplexing
8. Socket Option

**Source : [2],[3]** | **10%** |
| 6,7 | Students can understand TCP Client-Server, Multiplexing, and Socket Option | 1. Accuracy explains the concept of UDP socket programming
2. Ability to create a UDP socket programming program (Text sending application using UDP)
 | **Criteria :**1. Quiz Assessment
2. Task Assessment
3. Participation in classroom
4. *Problem Based Learning*
5. Network application demonstration
 | * **Lectures:**

Practicum**[TM: 2x (2x 100’’)]*** **Assignment dan Report:**

Problem-solving about identifying requirements and designing the template**[BT+BM: (2)x(2x70”)]** | [1] UDP Socket Programming* Introduction
* recvfrom and sendto Functions
* UDP Echo Server: main Function
* connect Function with UDP
1. UDP Advanced Socket Progamming
* Introduction
* When to Use UDP Instead Of TCP
* Adding Reliability to a UDP Application
* IPv6 Packet Information

**Source : [2],[4]** | **15%** |
| 8 | **Mid Semester Exam** |
| 9 | Students can understand the use of DBMS in Socket Programming | 1. The accuracy of choosing a DBMS
2. The accuracy of managing the DBMS
3. The accuracy of creating an online account
4. The accuracy of using an online server
 | **Criteria :**1. Quiz Assessment
2. Task Assessment
3. Participation in classroom
4. *Problem Based Learning*
5. Network application demonstration
 | * **Lectures:**

Practicum**[TM: 1x (2x 100’’)]*** **Assignment dan Report:**

Problem-solving about DBMS**[BT+BM: (1)x(2x70”)]** | 1. DBMS Connection in Java
2. I/O Stream management using DBMS

**Source: [1],[4]** | **10%** |
| 10, 11 | Students can implement network programming applications | 1. The accuracy of the webserver configuration
2. Ability to manage DNS, domain, and hosting
3. Ability to manage FTP accounts
4. The accuracy of utilizing Network programming applications
 | **Criteria :**1. Quiz Assessment
2. Task Assessment
3. Participation in classroom
4. *Problem Based Learning*
5. Network application demonstration
 | * **Lectures:**

Practicum**[TM: 2x (2x 100’’)]*** **Assignment dan Report:**

Problem-solving about network programming implementation**[BT+BM: (2)x(2x70”)]** | 1. Implementation of network programming:
2. Webserver
3. DNS server
4. Domain
5. Hosting
6. FTP server

**Source [5], [7]** | **10%** |
| 12,13 | Students can understand about DBA network | 1. Accuracy in DBA implementation
2. Accuracy in managing network transactions
3. Accuracy in managing network users
 | **Criteria :**1. Quiz Assessment
2. Task Assessment
3. Participation in classroom
4. *Problem Based Learning*
5. Network application demonstration
 | * **Lectures:**

Practicum**[TM: 2x (2x 100’’)]*** **Assignment dan Report:**

Problem-solving about DBA network**[BT+BM: (2)x(2x70”)]** | 1. DBA Networking
2. Lock Transaction
3. Account Previleges

**Source : [5], [7]** | **10%** |
| 14,15 | Students can understand making network-based monitoring systems | 1. Accuracy in explaining the concept of a network-based monitoring system
2. Simple Network Management Protocol (SNMP) application configuration capabilities
 | **Criteria :**1. Quiz Assessment
2. Task Assessment
3. Participation in classroom
4. *Problem Based Learning*
5. Network application demonstration
 | * **Lectures:**

Practicum**[TM: 2x (1x 100’’)]*** **Assignment dan Report:**

Problem-solving about SNMP**[BT+BM: (2)x(2x70”)]** | 1. Network monitoring
2. SNMP

**Source: [5], [7]** | **10%** |
| 16. | Students can manage network security systems | 1. Accuracy describes the concept of network security
2. Firewall configuration capability
 | **Criteria :**1. Quiz Assessment
2. Task Assessment
3. Participation in classroom
4. *Problem Based Learning*
5. Network application demonstration
 | * **Lectures:**

Practicum**[TM: 1x (2x 100’’)]*** **Assignment dan Report:**

Problem-solving about network security systems**[BT+BM: (1)x(2x70”)]** | 1. Network security concept
2. Concept and Implementation of *Firewall*

**Source: [5], [7]** | **10%** |
| 17 | **Final Semester Exam** |