OUTLINE OF LEARNING PROGRAMS
LEARNING PLAN UNITS
COURSE CONTRACT

COMPUTER NETWORK
CODE : PAC 143

STUDY PROGRAM OF COMPUTER SCIENCE
MATHEMATICS DEPARTMENT
FACULTY OF MIPA
DIPONEGORO UNIVERSITY

OUTLINE OF LEARNING PROGRAMS

Course Name : Computer Network
Course Id : PAC143
Credits : 3

A. Description

Computer Network Introduction, LAN, MAN, WAN, wireless network, data comunication and computer network standard system, Arsitecture, Infrastructure, Data Transmission Basic. Synchron Data Transmission and Asincron, Error detection, Error and Flow Control, LAN protocol technology, Ethernet LAN, Routing Algorithm, Backward Search Algorithm, Purpose and Internetworking principle, IP Versi 4, and Versi 6.
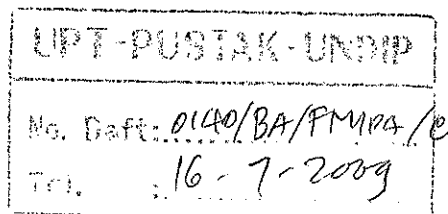
B. General Purpose

General purpose of this lesson is to form and develop :
1. Knowledge about computer network base concept.
2. Ability does implementation of computer network to as according to requirement.
3. Make Foundation for expansion of computer network towards network security and network programming.

C. Course Unit

No.	Specific Purpose	Topic	Sub Topic	Time
1.	Asked about comunication Model, comunication data, Circuit Switching, Packet Switching, The Internet, Intranet/Extranets, OSI model, and TCP/IP architecture, student have answered 90% true.	Introduction	1. comunicatin model 2. Data comunication 3. Circuit Switching, Packet Switching 4. The Internet, Intranets/Extranets 5. OSI model 6. TCP/IP Architecture	2 x 3 x 50 minute
2.	If it is given question about term applied at application in computer network, hence student can explain understanding and its(the penggunaa is minimum 90% correctness	Basic Application Of Computer network	1. Old Application (telnet, SMTP, FTP) 2. Modern Application (http,DNS, Socket)	2 x 3 x 50 minute
3.	If it is given question about term applied in data transmission, analogous data transmission and digital,gangguan-gangguan transmission, and transmission media, hence student can explain	Data Transmision	1. Base concept trasmisi data 2. Digital and analogous data transmission 3. Error Transmission 4. Transmission media	1 x 3 x 50 minute

No.	Specific Purpose	Topic	Sub Topic	Time
	understanding and handling technique of minimum transmission trouble of 90%			
4.	If it is given question of data ode , hence student can explain the minimum understanding of 90% correctness.	Data Encoding	1. Data Encoding 2. Data Digital -Sinyal Digital and Data Digital-Sinyal Analog. 3. Data analog-sinyal digital and data analog-sinyal analog.	1 x3 x 50 minute
5.	If it is given question about local area network(LAN) and ethernet , hence student can explain the minimum understanding of 90% correctness.	Local area network (LAN) and ethernet	1. Architecture 2. Topology 3. Technology	2 x 3 x 50 minute
	evaluation	Middle Test of Semester		2 x 50 minute
6.	If it is given question about Data Link Control , hence student can explain understanding and making technique of the minimum static situs of 90% correctness.	Data Link Control	1. Flow control 2. Error detection and correction 3. Sliding Window Protocols 4. HDLC, LLC	1 x3 x 50 minute
7.	If it is given question about Internet Protocol (IP) and Internetworking , hence student can explain the minimum understanding of 90% correctness.	Internet Protocol (IP) and Internetworking	1. Internet Protocol 2. Internetworking	1 x 3 x 50 minute
8.	If it is given question about Routing in Internet Proctocol , hence student can explain the minimum understanding of 90% correctness.	Routing	1. Basic Routing 2. Type Routing 3. Algorithm of Routing 3. Application Routing	1 x 3 x 50 minute
9.	If it is given question about Routing in Internet Proctocol , hence student can explain the minimum understanding of 90% correctness.	Transport Protocol	1. Transport Protocol 2. TCP 4. UDP	1 x 3 x 50 minute
10.	If it is given question about phase phase in	Socket Programming	1. Basic Socket Programming	2 x 3 x 50

No.	Specific Purpose	Topic	Sub Topic	Time
	programming socket , hence student can explain minimum understanding of 90% correctness.		2. TCP Socket 3. UDP Socket	minute
11.	If it is given question about network security , hence student can explain minimum understanding of 90% correctness.	Network Security	1. Basic Network Security 2. Type of Deffence 3. Type of Attack	1 x3 x 50 minute
	evaluation	Final Exam		2 x 50 minute

LEARNING PLAN UNIT

Course	:	Computer Network
Course ID	:	PAC143
Credits	:	3
Time	:	2 x 3 x 50 minute
Week Time	:	I + II

A. Purrprose :

   1. General : Student knows about data communication, Circuit Switching, Packet Switching, The Internet, Intranet/Extranets, OSI, and TCP/IP Achitecture.

   2. Specific : Asked about comunication Model, comunication data, Circuit Switching, Packet Switching, The Internet, Intranet/Extranets, OSI model, and TCP/IP architecture, student have answered 90% true.

B. Topic : Introduction

C. Sub Topic :
1. Data Communication
2. Circuit Switching, Packet Switching
3. The Internet, Intranets/Extranets
4. OSI
5. TCP/IP Architecture

D. Activity and Media Equipment of Teaching

Phase	Lecture Activity	Student Activity	Media and Equipment
1	2	3	4
Introduction	1. Explains matter coverage in meeting I 2. Explains benefit to comprehend data communication base concept. 3. Explains interest in General and Specific Purpose for meeting I.	• attention. • attention. • attention.	• LCD • LCD • LCD
Presentation	4. Communications Model • Student recognizes communications models. 5. Data communication	• Attention and make notes. • Attention and make	• LCD , OHP, Whiteboard • LCD , OHP,

Phase	Lecture Activity	Student Activity	Media and Equipment
1	2	3	4
	• Student can explain what is the meaning data. • Student can tell meksud data communication. 6. Circuit Switching, Packet Switching • Student understands Circuit Switching, Packet Switching. • Student can mention type Circuit Switching, Packet Switching • Student can exemplify Circuit Switching, Packet Switching. 7. The Internet, Intranets/Extranets • Student understands intention The Internet, Intranets/Extranets. • Student can explain carefully about The Internet, Intranets/Extranets. 8. OSI • Student is more understands about layer OSI. • Student is more recognizingly is applying of layer OSI. • Student can mention function of layer OSI carefully and precise. 9. TCP/IP Architecture • Student is more understands about layer TCP/IP. • Student is more recognizingly is applying of layer TCP/IP. • Student can mention function of layer TCP/IP carefully and precise	notes. • Attention and make notes. • Attention and make notes. • Attention and make notes. • Attention and make notes.	Whiteboard • LCD , OHP, Whiteboard • LCD , OHP, Whiteboard • LCD , OHP, Whiteboard • LCD , OHP, Whiteboard
Conclusion	10. Conclusion: a. Gives questions to student and does discussion for the agenda of giving understanding betterly about matter taught. b. Gives some reinforcement to student. c. Re-explains about things which still have not been understood by student. d. Embraces shortly and studies interrelationship with the next kuliah matter.	• Discussion	• LCD , OHP, Whiteboard

E.   Evaluation
1.   Gives duty to write into student to present example of Pemanfaatan Komunikasi Data and its(the penjelasa as according to matter which has been given, to know level of absorbtion of matter by student.
2.   Assessment the next week after student delivers they duty.

F. Reference
1. Douglas Comer, **Computer Networks and Internets with Internet Applications, 4th edition**, Prentice Hall : 2004
2. Tanenbaum, Andrew, "**Computer Networks**", **4th Ed**. Prentice Hall, 2003
3. William Stallings, **Computer Networking with Internet Protocols and Technology**, Prentice Hall : 2004

LEARNING PLAN UNIT

Course   :   Computer Network
Course ID   :   PAC143
Credits   :   3
Time   :   2 x 3 x 50 minute
Week Time   :   III + IV

A. Purpose   :
   1. General   :   After follow this course , student can get description of the application of base in computer network so that from beginning of can have abstaksi which is good

   2. Specific   :   If it is given question about term applied at application in computer network, hence student can explain understanding and its(the penggunaa is minimum 90% correctness.

B. Topic   :   Basic Computer network Application

C. Sub Topic   :   1.   Old Application (telnet, SMTP, FTP)
                              2.   Modern Application (http,DNS, Socket)

D. Activity and Media Equipment of Teaching

Phase	Lecture Activity	Student Activity	Media and Equipment
1	2	3	4
Introduction	1. Explains matter coverage in meeting III. 2. Explains Computer Network Application Purpose 3. Explains interest in General and Specific Purpose for meeting III	• Attention. • Attention. • Attention.	• LCD, OHP • LCD, OHP • LCD, OHP
Presentation	4. Concept and terms • Student understands concept the application of Computer Network in detail. • Student understands and memorizes with terms applied in the application of Computer Network data. 5. Simple Application • Student recognizes kinds of the application of Sederhana telnet case study, SMTP and ftp • Student can tell mode of action the Simple application	• Attention and make notes. • Attention and make notes.	• OHP, Whiteboard. • LCD , OHP, Whiteboard.

Phase	Lecture Activity	Student Activity	Media and Equipment
1	2	3	4
	• Student can differentiate the Simple application. 6. Modern Application • Student recognizes kinds of the application of modern in Computer Network like http, DNS and socket. • Student can tell mode of action the application of the modern . • Student can differentiate the application of modern.	• Attention and make notes.	• LCD, OHP, Whiteboard.
Conclusion	7. Conclusion: a. Gives questions to student and does discussion for the agenda of giving understanding betterly about matter taught. b. Gives some reinforcement to student. c. Re-explains about things which still have not been understood by student. d. Embraces shortly and studies interrelationship with next course.	• Discussion	• LCD, OHP, Whiteboard.

E. Evaluation

1. Gives duty to write into student to explain the application of Computer Network known, to be presented in class.
2. Assessment the next week after student delivers they duty.

F. Reference

1. Douglas Comer, **Computer Networks and Internets with Internet Applications, 4th edition**, Prentice Hall : 2004
2. Tanenbaum, Andrew, "**Computer Networks**", **4th Ed**. Prentice Hall, 2003
3. William Stallings, **Computer Networking with Internet Protocols and Technology**, Prentice Hall : 2004

LEARNING PLAN UNIT

Course	:	Computer Network
Course Id	:	PAC143
Credits	:	3
Time	:	3 x 50 Minute
Week Time	:	V

A. Purpose	:	
3. General	:	After follow this course , student comprehends concept and term applied in data transmission, and gets the description about analogous data transmission and digital,error transmission, and transmission media.
4. Specific	:	If it is given question about term applied in data transmission, analogous data transmission and digital,error transmission, and transmission media, hence student can explain understanding and handling technique of minimum transmission trouble of 90% correctness.
B. Topic	:	Data Transmission
C. Sub Topic	:	1. Basic Data Transmission
		2. Data Transmission analog and digital
		3. Error Transmission
		4. Transmission Data

D. Activity and Media Equipment of Teaching

Phase	Lecture Activity	Student Activity	Media and Equipment
1	2	3	4
Introduction	1. Explains matter coverage in meeting III. 2. Explains benefit to comprehend Data transmission Concept. 3. Explains interest in General and Specific Purpose for meeting III	• Attention. • Attention. • Attention.	• LCD, OHP • LCD, OHP • LCD, OHP
Presentation	4. Concept and terms • Student understands transmission concept in detail. • Student understands and memorizes with terms applied in data communication.	• Attention and make notes.	• OHP, Whiteboard.

Phase	Lecture Activity	Student Activity	Media and Equipment
1	2	3	4
	5. Data Transmission Analog and Digital • Student knows about data analog and digital. • Student can description about data transmission analog and data transmission digital. • Student can differentiate between analogous data transmissions and digital data transmission.	• Attention and make notes.	• LCD , OHP, Whiteboard.
	6. Transmision Problem • Student knows about Transmision Problem (analog & digital). • Student can recognize transmission trouble (analogue & digital)	• Attention and make notes.	• LCD, OHP, Whiteboard.
	7. Transmission Media • Student can explain function of transmission media carefully. • Student can mention transmission media type applied	• Attention and make notes.	• LCD, OHP, Whiteboard.
Conclusion	8. Conclusion: • Gives questions to student and does discussion for the agenda of giving understanding betterly about matter taught. • Gives some reinforcement to student. • Re-explains about things which still have not been understood by student. • Embraces shortly and studies interrelationship with next course.	• Diskusi Melaksanakan, mengemukakan pendapat.	• LCD, OHP, Whiteboard.

E. Evaluation

1. Gives duty to write into student to explain the transmission media in marketing and explained, to be presented in class.
2. Assessment the next week after student delivers they duty.

F. Reference

1. Douglas Comer, **Computer Networks and Internets with Internet Applications, 4th edition**, Prentice Hall : 2004
2. Tanenbaum, Andrew, **"Computer Networks", 4th Ed**. Prentice Hall, 2003
3. William Stallings, **Computer Networking with Internet Protocols and Technology**, Prentice Hall : 2004
1.

COURSE CONTRACT
Computer Networks
PAC143
3 credits

Instructor : Drs Eko Adi Sarwoko,M.Kom, Adi Wibowo, S.Si, bowo.adi@gmail.com

Text : Computer Networking with Internet Protocols and Technologies, William Stallings, ISBN: 0-13-191155-4

Reference : Computer Networks, 4th edition, Andrew Tanenbaum , ISBN: 0-13-038488-7

Reference : Computer Networks and Internets with Internet Applications, Douglas Comer, 4th ed., ISBN:013-123627X

Reference :Computer Networking:A top-down approach featuring the Internet,Kurose&Ross,3rd ed.,ISBN:0321269764

Tentative Outline

- Introduction
  - o OSI Model , TCP/IP Architecture
  - o The Internet, Intranets/Extranets
  - o Standardization efforts -
  - o Circuit Switching, Packet Switching
- Applications
  - o traditional apps (telnet, SMTP, FTP)
  - o modern apps (HTTP, DNS, Sockets)
- Data Transmission Basics
- Local Area Networks (LANs) and Ethernet
  - o Architecture, Topologies and Technologies
- Data Link Control and Protocols
  - o Flow control
  - o Error detection and correction
  - o Sliding Window Protocols
- Internet Protocol (IP) and Internetworking
- Routing
- Transport Protocols (TCP)
- Congestion Control
- TCP Traffic Control
- Network Security (as time permits, but time never permitted in the past)

Student responsibilities and grading (tentative)

There will be 4-5 labs. During these labs you will have hands-on experience and/or practical lectures on Internet protocols (via packet capturing and analysis), DNS and various server installations and configurations, LAN design and implementation, IP subnetting. More information on lab sessions will be posted on the web site in time.

There will be 4 - 5 homework assignments and a term project. Homework assignments will mostly be related labs. However there may be a few assignments about lecture material as well. Some homework may require programming. Homework assignments are to be done individually. Moreover there will be term project. Project will be about implementing/simulating computer network features and/or development of applications that run on networks (this may also require an application layer protocol design). Students may work in teams for the term project.

Tentative Grading

Midterm exam 30%

Final exam 35%

Homework, project and labs 35%

Important Dates

Midterm Exam: week 7 or 8 tentatively at class time.

Final Exam: as scheduled by registrar

Homework, project and lab deadlines will be specified separately