	Universitas Negeri Surabaya Faculty of Engineering, Electrical Engineering Masters Study Program	Document Code

SEMESTER LEARNING PLAN

Courses		CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Telecommunication Systems		2010102009		T=2	P=0	ECTS=4.48	1	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	....	....	Unit Three Kartini, S.T., M.T., Ph.D.

Learning model	Case Studies

Program Learning Outcomes (PLO)	PLO study program that is charged to the course
	Program Objectives (PO)
	PLO-PO Matrix

	P.O

	P.O	Week															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16

PO Matrix at the end of each learning stage (Sub-PO)

Short Course Description	Conduct studies and provide an understanding of telecommunications systems, signal analysis and frequency domain systems, analog signal transmission systems and digital transmission systems, noise, SNR, BER, channel capacity, types of analog modulation and digital coding, telecommunications protocols and standards, systems and Telephone and computer networks, Wireless Communications and satellite communications, Fiber Optic Communication Systems, telecommunications simulation support software

References	Main :	

1. John G Proakis, Masoud Salehi. 2001. Communications Systems and Engineering. 2nd Edition, Prantice Hall, Inc
2. Roger L Freeman, 1999 . Fundamental of Telecommunications . John Wiley& Sons,Inc Prentice- Hall, Inc.
3. John G. Proakis,Masoud Salehi,Gerhard Bauch. 2012. Contemporary Communication Systems Using MATLAB. Cengage Learning
4. C. Richard Johnson ,Jr., William A.Sethares. 2003. Telecommunication Breakdown Concepts of Communication Transmitted via Software-Defined Radio (Matlab code). Prentice Hall

Supporters:	

Supporting lecturer	Dr. Nurhayati, S.T., M.T.

Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)
		Indicator	Criteria & Form	Offline (*offline*)	Online (*online*)		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

1	Describe a telecommunications system	· Describe the history of communication systems. · Explain the block diagram of a telecommunications system. Explain the types of communication channels		2 X 50 Direct Learning Model			0%
2	Shows analysis of frequency domain system signals and noise	· Identify Analog and Digital Signals · Identify signal analysis using Fourier transformation · Explain the nature, energy and power of signals. · Understand band limited and bandpass signals. Explain the types of noise in telecommunications		Problem Based Learning (PrBL) Model 2 X 50			0%
3	Identifying SNR, BER, channel capacity, data rate, channel capacity	1. Describe the meaning of modulation 2. Determine the types of analog modulation: AM, FM, PM Describe electronic circuits · analog modulator and demodulator. · Explain the difference between analog and digital signal transmission. · Determine the types of digital modulation: ASK, FSK, PSK and digital modulation electronic circuits		· Direct and Cooperative Learning Model 2 X 50			0%
4	Describe the types of analog and digital modulation	1. Describe the meaning of modulation 2. Determine the types of analog modulation: AM, FM, PM Describe electronic circuits · analog modulator and demodulator. · Explain the difference between analog and digital signal transmission. · Determine the types of digital modulation: ASK, FSK, PSK and digital modulation electronic circuits		· Direct and Cooperative Learning Model 2 X 50			0%
5	Describe the types of analog and digital modulation	1. Describe the meaning of modulation 2. Determine the types of analog modulation: AM, FM, PM Describe electronic circuits · analog modulator and demodulator. · Explain the difference between analog and digital signal transmission. · Determine the types of digital modulation: ASK, FSK, PSK and digital modulation electronic circuits		· Direct and Cooperative Learning Model 2 X 50			0%
6	Describe the various types of coding	· Describe the various types of coding (line coding, source coding) · Show block coding (block coding)		Task Based Cooperative Learning Model (Task Based Learning-TBL) 2 X 50			0%

No	Learning Objective	Description		Method / Time			Percentage
7	Describe the various types of coding	· Describe the various types of coding (line coding, source coding) · Show block coding (block coding)		Task Based Cooperative Learning Model (Task Based Learning-TBL) 2 X 50			0%
8	Shows Telecommunication Protocols and Standards	· Explain telecommunications protocols · Describe telecommunications standards		Direct and Cooperative Learning Model 2 X 50			0%
9	UTS			2 X 50			0%
10	Shows System and network performance of Phone and computer	· Demonstrate the system and performance of local and long distance telephone networks · Describe computer networks		Cooperative learning 2 X 50			0%
11	Wireless communications and satellite communications.	· Demonstrate wireless communications · Describe FDMA, TDMA and CDMA technologies · Demonstrate GSM networks · Explain satellite networks and RADAR		· 2 X 50 Cooperative Learning Model			0%
12	Wireless communications and satellite communications.	· Demonstrate wireless communications · Describe FDMA, TDMA and CDMA technologies · Demonstrate GSM networks · Explain satellite networks and RADAR		· 2 X 50 Cooperative Learning Model			0%
13	Describe fiber optic and laser communication system technology	· Describe block diagrams and types of optical fiber from transmitter, channel and receiver · Trace, loss, attenuation and power budget on optical fiber Explain FTTC, FTTB, FTTH, FTTA, WDM, ODN and PON technology		· 2 X 50 Cooperative Learning Model			0%
14	· Cooperative Learning Model	- Introduce telecommunications electronics simulation software such as multisim - Introduce Matlab simulation software. Introducing antenna simulation software		2 X 50			0%
15	· Cooperative Learning Model	- Introduce telecommunications electronics simulation software such as multisim - Introduce Matlab simulation software. Introducing antenna simulation software		2 X 50			0%
16							0%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
		0%

Notes

1. **Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
2. **The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
3. **Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
4. **Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
5. **Indicators for assessing** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities or performance of student learning outcomes accompanied by evidence.
6. **Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.
7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.