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

SEMESTER LEARNING PLAN

Courses		CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Telecommunication Network		2020103383		**T=3**	**P=0**	**ECTS=4.77**	5	April 10, 2023

AUTHORIZATION		SP Developer	Course Cluster Coordinator	Study Program Coordinator
		Farid Baskoro, S.T., M.T. ; Dr. Raden Roro Hapsari Peni Agustin Tjahyaningtijas, S.Si., M.T.	Prof. Dr. I Gusti Putu Asto B., M.T.	Dr. Lusia Rakhmawati, S.T., M.T.

Learning model	Project Based Learning

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

	P.O

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

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

Short Course Description	This course aims to ensure that students after and during this course understand what a Telecommunication Network is, what the benefits of a Telecommunication Network are, and what are the completeness of a Telecommunication Network. Furthermore, regarding the development of telecommunications networks. Network architecture. Transmission media: copper, fiber, radio frequency. Non-digital and digital switching technology. Telecommunication terminals: facsimile telephone, multimedia terminal. Telecommunication network planning: Topology, numbering, routing, signaling. Introduction to data communications. IP, Frame relay and ATM networks. Network management.

References block

References	Main :

1. Tarmo Anttalainen, Introduction to telecommunication Network Engineering&rdquo Artech HouseAlberto Leon-Garcia & Indra Wijaya, Communication Networks, Fundamental Concept and Key Architecture&rdquo, Mc Graw Hill
2. 1. Rosengrant MA., Introduction to Telecommunication, Prentice Hall, 2002 2. Roger L Freeman, Telecommunication System Engeenering, 3) Sigit Haryadi, Jaringan Telekomunikasi, Dete Elenkreasi, 1994 4). Andrew S. Tanenbaum, Computer Networks, Prentice-Hall of India Private Limited,New Delhi- 110001, 1990.

	Supporters:

1. 1. Kennedy, Goerge, Electronic Communication System, Mc.Graw Hill Book Company, Australia, 1985. 2. Killen, Harold B., Telecommunications and Data Communication System Design with Troubleshooting, Prentice-Hall, Inc., New Jersey, 1986.

Supporting lecturer	Dr. Raden Roro Hapsari Peni Agustin Tjahyaningtijas, S.Si., M.T. Dr. Farid Baskoro, 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	I). Discussing the lecture syllabus and accommodating various input from students to provide the possibility of revising topics that are considered unimportant and including topics that are considered important. In accordance with what is stated in the syllabus, at this meeting the objectives, scope, lecture procedures, explanation of the tasks that students must carry out, exams that must be taken including the types of questions and how to solve/answer questions, and resources are also explained. Finally, provide an introductory description of Telecommunication Networks.	I). Discussing the lecture syllabus and accommodating various input from students to provide the possibility of revising topics that are considered unimportant and including topics that are considered important. In accordance with what is stated in the syllabus, at this meeting the objectives, scope, lecture procedures, explanation of the tasks that students must carry out, exams that must be taken including the types of questions and how to solve/answer questions, and resources are also explained. Finally, provide an introductory description of Telecommunication Networks.	**Criteria:** Full marks are obtained if you do all the questions correctly **Form of Assessment** : Participatory Activities	Lectures, discussions, presentations 3 X 50		**Material:** I). Discussing the lecture syllabus and accommodating various input from students to provide the possibility of revising topics that are considered unimportant and including topics that are considered important. In accordance with what is stated in the syllabus, at this meeting the objectives, scope, lecture procedures, explanation of the tasks that students must carry out, exams that must be taken including the types of questions and how to solve/answer questions, and resources are also explained. Finally, provide an introductory description of Telecommunication Networks. **References:** *1. Rosengrant MA., Introduction to Telecommunication, Prentice Hall, 2002 2. Roger L Freeman, Telecommunication System Engineering, 3) Sigit Haryadi, Telecommunication Networks, Dete Elenkreasi, 1994 4). Andrew S. Tanenbaum, Computer Networks, Prentice-Hall of India Private Limited, New Delhi-110001, 1990.*	5%
2	II). Understanding and definitions, Global Telecommunication Network System (including: Transmitter, Media/Transmission Channel and Receiver)	can explain the meaning and definitions, Global Telecommunication Network System (including: Transmitter, Media/Transmission Channel and Receiver)	**Criteria:** Full marks are obtained if you do all the questions correctly **Form of Assessment** : Participatory Activities	Lectures, discussions, presentations 3 X 50		**Material:** Understanding and definitions, Global Telecommunication Network System (including: Transmitter, Media/Transmission Channel and Receiver) **References:** *1. Rosengrant MA., Introduction to Telecommunication, Prentice Hall, 2002 2. Roger L Freeman, Telecommunication System Engineering, 3) Sigit Haryadi, Telecommunication Networks, Dete Elenkreasi, 1994 4). Andrew S. Tanenbaum, Computer Networks, Prentice-Hall of India Private Limited, New Delhi-110001, 1990.*	5%

3	Benefits and completeness/infrastructure of Telecommunication Networks	can explain the benefits and completeness/infrastructure of the Telecommunication Network	**Criteria:** Full marks are obtained if you do all the questions correctly **Form of Assessment** : Participatory Activities	Lectures, discussions, presentations 3 X 50		**Material:** Meeting material 3 **References:** *1. Rosengrant MA., Introduction to Telecommunication, Prentice Hall, 2002 2. Roger L Freeman, Telecommunication System Engineering, 3) Sigit Haryadi, Telecommunication Networks, Dete Elenkreasi, 1994 4). Andrew S. Tanenbaum, Computer Networks, Prentice-Hall of India Private Limited, New Delhi-110001, 1990.*	5%
4	Development and Development of Telecommunication Networks and their prospects.	Development and Development of Telecommunication Networks and their prospects.	**Criteria:** Full marks are obtained if you do all the questions correctly **Form of Assessment** : Participatory Activities	Lectures, discussions, presentations 3 X 50		**Material:** Development and Development of Telecommunication Networks and their prospects from 1G to 5.5 G **References:** *1. Rosengrant MA., Introduction to Telecommunication, Prentice Hall, 2002 2. Roger L Freeman, Telecommunication System Engineering, 3) Sigit Haryadi, Telecommunication Networks, Dete Elenkreasi, 1994 4). Andrew S. Tanenbaum, Computer Networks, Prentice-Hall of India Private Limited, New Delhi-110001, 1990.*	5%
5	Telecommunication Network media and Telecommunication Network architecture.	Students can explain Telecommunications Network Media and Telecommunications Network architecture.	**Criteria:** Full marks are obtained if you do all the questions correctly **Form of Assessment** : Participatory Activities, Tests	Lectures, discussions, presentations 3 X 50		**Material:** Telecommunication Network Media and Telecommunication Network architecture. **References:** *1. Rosengrant MA., Introduction to Telecommunication, Prentice Hall, 2002 2. Roger L Freeman, Telecommunication System Engineering, 3) Sigit Haryadi, Telecommunication Networks, Dete Elenkreasi, 1994 4). Andrew S. Tanenbaum, Computer Networks, Prentice-Hall of India Private Limited, New Delhi-110001, 1990.*	8%
6	Can simulate and also analyze circuits, digital modulation input and output, ASK, FSK, PSK	Students can explain Telecommunication Network Media.	**Criteria:** Full marks are obtained if you do all the questions correctly **Form of Assessment** : Participatory Activities, Tests	Lectures, discussions, presentations 3 X 50		**Material:** Meeting material 6 **Bibliography:** *1. Kennedy, Goerge, Electronic Communication System, Mc.Graw Hill Book Company, Australia, 1985. 2. Killen, Harold B., Telecommunications and Data Communication System Design with Troubleshooting, Prentice-Hall, Inc ., New Jersey, 1986.*	5%

7	Non-digital and digital switching technology.	Students can explain non-digital and digital switching technology.	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	Contextual Instruction 3 x 50		**Material:** Meeting material 7 **Bibliography:** *Tarmo Anttalainen, Introduction to telecommunication Network Engineering&rdquo Artech HouseAlberto Leon-Garcia & Indra Wijaya, Communication Networks, Fundamental Concept and Key Architecture&rdquo, Mc Graw Hill*	8%
8	UTS	According to the Question Rubric		Written Test 3 x 50		**Material:** Meeting material 1-7 **Bibliography:** *Tarmo Anttalainen, Introduction to telecommunication Network Engineering&rdquo Artech HouseAlberto Leon-Garcia & Indra Wijaya, Communication Networks, Fundamental Concept and Key Architecture&rdquo, Mc Graw Hill*	8%
9	Telecommunications terminals: telephone, facsimile and multimedia, mobile phones, etc	Students can explain telecommunications terminals: telephone, facsimile and multimedia, mobile phones, etc.	**Form of Assessment** : Participatory Activities	case Method 3 x 50		**Material:** students can explain telecommunications terminals: telephone, facsimile and multimedia, handphone, etc. **References:** *1. Rosengrant MA., Introduction to Telecommunication, Prentice Hall, 2002 2. Roger L Freeman, Telecommunication System Engineering, 3) Sigit Haryadi , Telecommunication Networks, Dete Elenkreasi, 1994 4). Andrew S. Tanenbaum, Computer Networks, Prentice-Hall of India Private Limited, New Delhi-110001, 1990.*	5%

			Criteria: 8				
10	Introduction to Data Communications.	Students can explain data communications on telecommunications networks	**Criteria:** 8 **Form of Assessment** : Participatory Activities	case Method 3 x 50		**Material:** I). Discussing the lecture syllabus and accommodating various input from students to provide the possibility of revising topics that are considered unimportant and including topics that are considered important. In accordance with what is stated in the syllabus, at this meeting the objectives, scope, lecture procedures, explanation of the tasks that students must carry out, exams that must be taken including the types of questions and how to solve/answer questions, and resources are also explained. Finally, provide an introductory description of Telecommunication Networks. **References:** *1. Rosengrant MA., Introduction to Telecommunication, Prentice Hall, 2002 2. Roger L Freeman, Telecommunication System Engineering, 3) Sigit Haryadi, Telecommunication Networks, Dete Elenkreasi, 1994 4). Andrew S. Tanenbaum, Computer Networks, Prentice-Hall of India Private Limited, New Delhi-110001, 1990.*	0%
11	IP, Frame Relay and ATM networks	students are able to understand IP Networks, Frame Relay and ATM	**Form of Assessment** : Participatory Activities	case Method 3 x 50		**Material:** Meeting material 11 **Bibliography:** *1. Kennedy, Goerge, Electronic Communication Systems, Mc.Graw Hill Book Company, Australia, 1985. 2. Killen, Harold B., Telecommunications and Data Communication System Design with Troubleshooting, Prentice-Hall, Inc ., New Jersey, 1986.*	8%
12	IP, Frame Relay and ATM networks	students are able to understand IP Networks, Frame Relay and ATM	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	case Method 3 x 50		**Material:** Meeting material 11 **Bibliography:** *1. Kennedy, Goerge, Electronic Communication Systems, Mc.Graw Hill Book Company, Australia, 1985. 2. Killen, Harold B., Telecommunications and Data Communication System Design with Troubleshooting, Prentice-Hall, Inc ., New Jersey, 1986.*	8%

13	IP, Frame Relay and ATM networks	students are able to understand IP Networks, Frame Relay and ATM	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	case Method 3 x 50		**Material:** Meeting material 11 **Bibliography:** *1. Kennedy, Goerge, Electronic Communication Systems, Mc.Graw Hill Book Company, Australia, 1985. 2. Killen, Harold B., Telecommunications and Data Communication System Design with Troubleshooting, Prentice-Hall, Inc ., New Jersey, 1986.*	8%
14	IP, Frame Relay and ATM networks	students are able to understand IP Networks, Frame Relay and ATM	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	case Method 3 x 50		**Material:** Meeting material 11 **Bibliography:** *1. Kennedy, Goerge, Electronic Communication Systems, Mc.Graw Hill Book Company, Australia, 1985. 2. Killen, Harold B., Telecommunications and Data Communication System Design with Troubleshooting, Prentice-Hall, Inc ., New Jersey, 1986.*	8%
15	IP, Frame Relay and ATM networks	students are able to understand IP Networks, Frame Relay and ATM	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	case Method 3 x 50		**Material:** Meeting material 11 **Bibliography:** *1. Kennedy, Goerge, Electronic Communication Systems, Mc.Graw Hill Book Company, Australia, 1985. 2. Killen, Harold B., Telecommunications and Data Communication System Design with Troubleshooting, Prentice-Hall, Inc ., New Jersey, 1986.*	8%
16	Solving UAS questions	students are able to understand IP Networks, Frame Relay and ATM	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	case Method 3 x 50		**Material:** Meeting material 11 **Bibliography:** *1. Kennedy, Goerge, Electronic Communication Systems, Mc.Graw Hill Book Company, Australia, 1985. 2. Killen, Harold B., Telecommunications and Data Communication System Design with Troubleshooting, Prentice-Hall, Inc ., New Jersey, 1986.*	8%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	87.5%
2.	Test	6.5%
		94%

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** ability in the process and student learning outcomes are specific and measurable statements that identify the ability 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.