	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
Multimedia Signals and Systems	2020103180	Compulsory Study Program Subjects	T=3	P=0	ECTS=4.77	6	April 10, 2023

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	Dr. Nurhayati, S.T., M.T.	Prof. Dr. I Gusti Putu Asto B., M.T.	Dr. Lusia Rakhmawati, S.T., M.T.

Learning model	**Case Studies**

Program Learning Outcomes (PLO)

PLO study program that is charged to the course

Program Objectives (PO)

PO - 1	Able to apply knowledge of mathematics and multimedia signals to gain a thorough understanding of engineering principles.
PO - 2	Able to design multimedia signal processing applications to be applied in the field of electrical engineering
PO - 3	Able to communicate effectively both orally and in writing in presenting the results of multimedia signal processing
PO - 4	Able to apply engineering principles, identify, formulate and analyze data/information to solve problems in the fields of Telecommunications and intelligent computing
PO - 5	Able to plan, complete and evaluate tasks related to multimedia signal processing.

PLO-PO Matrix

P.O
PO-1
PO-2
PO-3
PO-4
PO-5

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
PO-1																
PO-2																
PO-3																
PO-4																
PO-5																

Short Course Description	Telecommunication and internet networks carry traffic, most of which is multimedia content, with rapid growth from year to year. In this course students will study the characteristics, generation and processing of various types of multimedia signals, including: image, video, sound and their combination. In addition, compression principles will be studied from aspects of information theory and signal theory, as well as modern coding techniques. Various modern encoding and compression methods used in various applications are also discussed, including: JPEG, JPEG2000, MPEG-1/2/4, mp3.
References	**Main :**

	1. Ze-Nian Li, Mark S. Drew, & Jiangchuan Liu. 2014. Fundamentals of Multimedia, 2nd ed. Springer. 2. Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning. 3. Srdjan Stankovic, Irena Orovic, & Ervin Sejdic. 2016. Multimedia Signals and Systems: Basic and Advanced Algorithms for Signal Processing, 2nd ed. Springer.
Supporters:	
	1. R.L. Freeman, Reference Manual for Telecommunications Engineering, 3rd edn. (Wiley, New York, 2001) 2. P.K. Andleigh, K. Thakrar, Multimedia Systems Design. (Prentice-Hall PTR, Upper Saddle River, 1995) 3. K.C. Pohlmann, Principles of Digital Audio, 6th edn. (McGraw-Hill, New York, 2010)
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	Students are able to explain and classify Multimedia	Evaluation Rubric	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	Contextual Instruction 2 X 50		**Material:** Meeting material 1 **Bibliography:** *Ze-Nian Li, Mark S. Drew, & Jiangchuan Liu. 2014. Fundamentals of Multimedia, 2nd ed. Springer.*	5%
2	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	5%

				process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
3	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities, Tests	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	5%

				schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
4	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer‘s questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	5%

				procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
5	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions,		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	5%

				question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
6	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems:*	8%

				The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions		*Algorithms, Standards, & Industry Practices. Cengage Learning.*	
7	Students are able to	Students are able to	**Criteria:** Evaluation Rubric	Discussion, question and		**Material:** Meeting	5%

	represent graphics and images	represent graphics and images		answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented.		material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	

				Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
8	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time.		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	5%

				students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
9	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations.		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	5%

				Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
10	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	7%

				cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
11	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	8%

				process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
12	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	8%

				schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
13	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer‘s questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	8%

				time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
14	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer‘s questions, question and		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	8%

				answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			
15	Students are able to represent graphics and images	Students are able to represent graphics and images	**Criteria:** Evaluation Rubric **Form of Assessment** : Participatory Activities	Discussion, question and answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer		**Material:** Meeting material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms,*	8%

				asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented. Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions		*Standards, & Industry Practices. Cengage Learning.*	
16	Students are able to represent	Students are able to represent	**Criteria:** Evaluation Rubric	Discussion, question and		**Material:** Meeting	8%

	graphics and images	graphics and images	**Form of Assessment** : Participatory Activities	answer, PPT - Method: Case Method Learning Step 1: Preparation of Case Examples Basic Questions The lecturer asks: what are the problems that arise, their causes and impacts? Students respond to lecturer's questions, question and answer Step 2: Determine discussion procedures (Individual/Ex) Lecturer determines collection procedures and time Lecturer makes agreement on deadline for collection, Gives students time to form groups Students Agree on schedule, Arrange groups, Step 3: Group Discussion Lecturer conducts observing/paying attention to the discussion process, providing information if necessary, encouraging all active group members . Students. Discussing examples of cases that will be taken. Collecting and processing supporting data. Analyzing cases and their solutions. Preparing presentations. Step 4: Group Presentation. Lecturer examines the presentation, provides opportunities for questions and answers. Provides time. students to reflect and revise cases presented. Provide suggestions and input on case examples presented.		material 2 **Readers:** *Parag Havaldar & Gérard Medioni. 2010. Multimedia Systems: Algorithms, Standards, & Industry Practices. Cengage Learning.*	

				Students collect discussion results according to the agreed time limit. Present and respond to 2 X 50 questions			

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	65.5%
2.	Test	2.5%
		68%

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.