

Universitas Negeri Surabaya Faculty of Engineering Electrical Engineering Education Undergraduate Study Program

Document Code

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Courses				со	DE			Cou	ırse F	amily		Cre	dit W	eight		SEM	IESTER	Compilation Date
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AUTHOR	IZAT	ION		SP	Develo	per					Cour	se Clu	ister C	Coord	linator		Study Program Coordinator	
																Dr.	Nur Kho	lis, S.T., M.T.
Learning model		Project Based L	.earn	ing														
Program		PLO study pro	grar	n tha	t is cha	rged	to the	cours	se									
Learning Outcomes (PLO)		Program Objectives (PO)																
		PLO-PO Matrix																
					P.O													
		PO Matrix at the end of each learning stage (Sub-PO)																
				P.0						_		Week				_		
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Short Course Descript	tion	This course includevelop competer the general under and (3) the implice	ency erstar	about nding	microw and cha	ave e ractei	nginee ristics a	ring. Th f micro	nis cou wave	urse is	divide	d into t	three r	nain j	parts, ea	ch of \	which is f	ocused on: (1
Reference	ces	Main :																
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		Supporters:																
Supporti lecturer	ing	Dr. Edy Sulistiyo	, M.F	۶d.														
Week-	eac stag	al abilities of h learning ge b-PO)		Indica		aluat	ion riteria	۶ Eorr	n	Help Learning, Learning methods, Student Assignments, [Estimated time]				ma	arning iterials [erences	Assessmen Weight (%)		
	(20	-,		muica			anteria		"		line(line)		Online	; (UN	iiie))]		
(1)		(2)		(3)			(4	4)		(5)			(6)			(7)	(8)

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	This course includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of microwave engineering, and (3) the implications of using microwave engineering.	 After taking this course students are expected to: Understand the concepts and theories about the function of microwave engineering Develop critical thinking regarding the design and application of microwave techniques Become an active learner and creator in building your own knowledge through direct study and study of microwave engineering practices. 	Criteria: 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 5.5. Task: 1 time, weight 20%	Direct learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations 3 X 50		0%
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11	This course includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of microwave engineering, and (3) the implications of using microwave engineering.	 After taking this course students are expected to: Understand the concepts and theories about the function of microwave engineering Develop critical thinking regarding the design and application of microwave techniques Become an active learner and creator in building your own knowledge through direct study and study of microwave engineering practices. 	Criteria: 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 5.5. Task: 1 time, weight 20%	Direct learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations 3 X 50		0%
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13	This course includes the	1.After taking	Criteria:	Direct		0%
	development of	this course	1.1. Participation	learning, cooperative		
	essential	students	in lectures: 16	learning,		
	knowledge, attitudes and skills	are	meetings, weight 20%	PjBL,		
	about microwave	expected to:	2.2. Mid-semester	Lectures,		
	engineering,	2.Understand	exam: 1 time,	Assignments,		
	especially to	the	weight 20%	Discussions		
	develop competency about	concepts	3.3. Final	and		
	microwave	and	semester exam:	Presentations		
	engineering. This	theories	1 time, weight	3 X 50		
	course is divided into three main	about the	30%			
	parts, each of	function of	4.4. Presentation			
	which is focused	microwave	(including			
	on: (1) the general	engineering	presentation			
	understanding and characteristics of	3.Develop	materials): 1			
	microwave	critical	time, 10% weight			
	engineering, (2)	thinking	5.5. Task: 1 time,			
	the functions and models of	regarding	weight 20%			
	microwave	the design				
	engineering, and	and				
	(3) the implications of using	application				
	microwave	of				
	engineering.	microwave techniques				
		4.Become an				
		active				
		learner and				
		creator in				
		building				
		your own				
		knowledge				
		through				
		direct study				
		and study				
		of				
		microwave				
		engineering				
		practices.				
14	This course	1.After taking	Criteria:	Direct		0%
14	includes the	this course	1.1. Participation	learning,		0%
14	includes the development of essential	this course students	1.1. Participation in lectures: 16	learning, cooperative		0%
14	includes the development of essential knowledge,	this course students are	1.1. Participation in lectures: 16 meetings, weight	learning, cooperative learning,		0%
14	includes the development of essential knowledge, attitudes and skills	this course students are expected	1.1. Participation in lectures: 16 meetings, weight 20%	learning, cooperative		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering.	this course students are expected to:	1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester	learning, cooperative learning, PjBL,		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to	this course students are expected to: 2.Understand	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop	this course students are expected to: 2.Understand the	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave	this course students are expected to: 2.Understand the concepts	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This	this course students are expected to: 2.Understand the	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided	this course students are expected to: 2.Understand the concepts and	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of	this course students are expected to: 2.Understand the concepts and theories	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused	this course students are expected to: 2.Understand the concepts and theories about the	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering 3.Develop	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering 3.Develop critical	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
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14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering 3.Develop critical thinking regarding	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
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14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of microwave engineering, and (3) the implications of using microwave	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering 3.Develop critical thinking regarding the design and application of microwave techniques 4.Become an active learner and creator in building your own	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 5.5. Task: 1 time, 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of microwave engineering, and (3) the implications of using microwave	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering 3.Develop critical thinking regarding the design and application of microwave techniques 4.Become an active learner and creator in building your own knowledge	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 5.5. Task: 1 time, 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of microwave engineering, and (3) the implications of using microwave	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering 3.Develop critical thinking regarding the design and application of microwave techniques 4.Become an active learner and creator in building your own knowledge through	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 5.5. Task: 1 time, 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of microwave engineering, and (3) the implications of using microwave	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering 3.Develop critical thinking regarding the design and application of microwave techniques 4.Become an active learner and creator in building your own knowledge through direct study	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 5.5. Task: 1 time, 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of microwave engineering, and (3) the implications of using microwave	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering 3.Develop critical thinking regarding the design and application of microwave techniques 4.Become an active learner and creator in building your own knowledge through	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 5.5. Task: 1 time, 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of microwave engineering, and (3) the implications of using microwave	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering 3.Develop critical thinking regarding the design and application of microwave techniques 4.Become an active learner and creator in building your own knowledge through direct study and study	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 5.5. Task: 1 time, 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of microwave engineering, and (3) the implications of using microwave	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering 3.Develop critical thinking regarding the design and application of microwave techniques 4.Become an active learner and creator in building your own knowledge through direct study and study of	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 5.5. Task: 1 time, 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%
14	includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of microwave engineering, and (3) the implications of using microwave	this course students are expected to: 2.Understand the concepts and theories about the function of microwave engineering 3.Develop critical thinking regarding the design and application of microwave techniques 4.Become an active learner and creator in building your own knowledge through direct study and study of microwave	 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 5.5. Task: 1 time, 	learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations		0%

15	This course includes the development of essential knowledge, attitudes and skills about microwave engineering, especially to develop competency about microwave engineering. This course is divided into three main parts, each of which is focused on: (1) the general understanding and characteristics of microwave engineering, (2) the functions and models of microwave engineering, and (3) the implications of using microwave engineering.	 After taking this course students are expected to: Understand the concepts and theories about the function of microwave engineering Develop critical thinking regarding the design and application of microwave techniques Become an active learner and creator in building your own knowledge through direct study and study of microwave engineering practices. 	Criteria: 1.1. Participation in lectures: 16 meetings, weight 20% 2.2. Mid-semester exam: 1 time, weight 20% 3.3. Final semester exam: 1 time, weight 30% 4.4. Presentation (including presentation materials): 1 time, 10% weight 5.5. Task: 1 time, weight 20%	Direct learning, cooperative learning, PjBL, Lectures, Assignments, Discussions and Presentations 3 X 50		0%
16						0%

 Evaluation Percentage Recap: Project Based Learning

 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.
- 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.
- 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.