	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
Electrical Engineering Project	2020102405	Compulsory Study Program Subjects	T=0	P=3	ECTS=4.77	5	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
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Learning model	**Project Based Learning**	
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**	
	PLO-6	Able to design system components and/or processes to be applied in the field of electrical engineering
	PLO-7	Able to design and carry out experiments in the laboratory/field as well as analyze and interpret data to strengthen technical assessments
	PLO-10	Able to convey ideas and/or ideas resulting from work and innovation in the field of electrical engineering effectively, both orally and in writing
	PLO-11	Able to plan, complete and evaluate tasks within the constraints that exist in the field of electrical engineering
	Program Objectives (PO)	
	PLO-PO Matrix	

P.O	PLO-6	PLO-7	PLO-10	PLO-11

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	The Electrical Engineering Project course using project based learning aims to provide a strong understanding of the basic concepts and principles of project management as well as the ability to apply them effectively in the electrical engineering industry. In addition, students will be trained to be able to plan, implement and control electrical engineering projects by paying attention to key aspects such as time, cost, quality and risk. Through this course, it is hoped that students can develop skills in managing human resources, technology and finances for electrical engineering projects, as well as improve their abilities in communicating, collaborating and leading project teams. Finally, students will be able to apply the knowledge and skills acquired in completing electrical engineering projects that are relevant to industrial needs, so that they are ready to enter the world of work with comprehensive abilities and in line with industry demands.
References	**Main :**

1. Paul Horowitz, Winfield Hill, The Art of Electronics, Cambridge University Press; 3rd edition, 2015.
2. Paul Scherz, Simon Monk, Practical Electronics for Inventors, Fourth Edition 4th Edition, 2016
3. J. David Irwin, R. Mark Nelms, Engineering Circuit Analysis, Wiley; 12th edition, 2021
4. C.A. Partridge, The National Electrical Code (NEC) for Electrical Project Managers: A Rapid Guide to Learn the Basics: 2023 Version Kindle Edition

Supporters:

1. Darren Ashby , Electrical Engineering 101: Everything You Should Have Learned in School...but Probably Didn't, Newnes; 3rd edition, 2011

Supporting lecturer	

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	1.Explains the definition of an electrical engineering project and its relevance in the industrial world 2.Explain the scope of the project and the stakeholders involved	1.Accurate explanation of the definition of an electrical engineering project and its relevance in the industrial world 2.Accurate explanation of the project scope and stakeholders involved	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	project based learning		**Material:** Introduction to Electrical Engineering Projects **Bibliography:** *Paul Scherz, Simon Monk, Practical Electronics for Inventors, Fourth Edition 4th Edition, 2016*	5%
2	1.Identify, formulate objectives, and develop project plans 2.Determine project scope and risk management 3.Schedule and allocate resources	1.Accuracy in identifying, formulating objectives, and developing project plans 2.Accuracy in determining project scope and risk management 3.Accuracy of scheduling and allocating resources	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	Project based learning		**Material:** Project Planning **Bibliography:** *Paul Scherz, Simon Monk, Practical Electronics for Inventors, Fourth Edition 4th Edition, 2016*	5%
3	1.Explain the concept of project control 2.Monitoring project progress and taking corrective action 3.Explain change management and conflict management	1.Accuracy of explaining the concept of project control 2.Accurate monitoring of project progress and taking corrective action 3.Accuracy of explaining change management and conflict management	**Form of Assessment** : Participatory Activities	Project based learning		**Material:** Project Control **Library:** **Material:** Project Control **Bibliography:** *Paul Scherz, Simon Monk, Practical Electronics for Inventors, Fourth Edition 4th Edition, 2016*	6%

4	1. Explain the importance of human resource management in projects 2. Distribute project team assignments and individual capability development 3. Explain leadership in the context of an electrical engineering project	1. Accuracy explains the importance of human resource management in projects 2. Accuracy in distributing project team assignments and developing individual capabilities 3. Accuracy explains leadership in the context of electrical engineering projects	**Criteria:** Assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	project based learning		**Material:** Human Resource Management in Projects **Bibliography:** *Paul Horowitz, Winfield Hill, The Art of Electronics, Cambridge University Press; 3rd edition, 2015.*	5%
5	implement electrical engineering projects in accordance with the plans that have been prepared	Accurate implementation of electrical engineering projects in accordance with the plans that have been prepared	**Form of Assessment** : Project Results Assessment / Product Assessment	Project based learning		**Material:** Project Implementation and Problem Solving **Bibliography:** *Paul Scherz, Simon Monk, Practical Electronics for Inventors, Fourth Edition 4th Edition, 2016*	5%
6	Presents the project results that have been achieved in the middle of the project cycle	Ability to present project results that have been achieved in the middle of the project cycle	**Criteria:** Assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	Project based learning		**Materials:** Mid-Project Presentation **Bibliography:** *Paul Horowitz, Winfield Hill, The Art of Electronics, Cambridge University Press; 3rd edition, 2015.*	5%
7	1. Discuss the successes and obstacles faced during the project process 2. Develop follow-up plans to overcome identified problems	1. Ability to discuss successes and obstacles encountered during the project process 2. Accuracy in preparing follow-up plans to overcome identified problems	**Form of Assessment** : Project Results Assessment / Product Assessment	project based learning		**Material:** Evaluation of Methods and Techniques Used **Bibliography:** *Darren Ashby, Electrical Engineering 101: Everything You Should Have Learned in School...but Probably Didn't, Newnes; 3rd edition, 2011*	2%

8	Carrying out Mid-Semester Exams	Accuracy in answering the written test	**Criteria:** Assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	writing test		**Material:** Evaluation of Methods and Techniques Used **Bibliography:** *Darren Ashby, Electrical Engineering 101: Everything You Should Have Learned in School...but Probably Didn't, Newnes; 3rd edition, 2011*	20%
9	1. Discuss the successes and obstacles faced during the project process 2. Develop follow-up plans to overcome identified problems	1. Ability to discuss successes and obstacles encountered during the project process 2. Accuracy in preparing follow-up plans to overcome identified problems	**Criteria:** Assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	project based learning		**Material:** Evaluation of Methods and Techniques Used **Bibliography:** *Darren Ashby, Electrical Engineering 101: Everything You Should Have Learned in School...but Probably Didn't, Newnes; 3rd edition, 2011*	2%
10	1. Discuss the successes and obstacles faced during the project process 2. Develop follow-up plans to overcome identified problems	1. Ability to discuss successes and obstacles encountered during the project process 2. Accuracy in preparing follow-up plans to overcome identified problems	**Criteria:** Assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	project based learning		**Material:** Evaluation of Methods and Techniques Used **Bibliography:** *Darren Ashby, Electrical Engineering 101: Everything You Should Have Learned in School...but Probably Didn't, Newnes; 3rd edition, 2011*	2%
11	identify potential risks in electrical engineering projects	accuracy of identifying potential risks in electrical engineering projects	**Criteria:** Assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	project based learning		**Material:** Risk Management in Electrical Engineering Projects **References:** *J. David Irwin, R. Mark Nelms, Engineering Circuit Analysis, Wiley; 12th edition, 2021*	2%
12	Explain ethics and social responsibility in electrical engineering projects.	Accuracy of explaining ethics and social responsibility in electrical engineering projects.	**Criteria:** Assessment rubric **Form of Assessment** : Project Results Assessment / Product Assessment	project based learning		**Material:** Ethics and Social Responsibility in Projects **Bibliography:** *Paul Horowitz, Winfield Hill, The Art of Electronics, Cambridge University Press; 3rd edition, 2015.*	2%

13	Evaluate project performance based on predetermined criteria	accuracy of evaluating project performance based on predetermined criteria	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities	project based learning		**Material:** Project Evaluation and Improvement **Bibliography:** *Darren Ashby , Electrical Engineering 101: Everything You Should Have Learned in School...but Probably Didn't, Newnes; 3rd edition, 2011*	2%
14	Presenting and closing the Project	accuracy of presenting and closing the project	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	project based learning		**Materials:** Project Presentation and Conclusion **Bibliography:** *CA Partridge, The National Electrical Code (NEC) for Electrical Project Managers: A Rapid Guide to Learn the Basics: 2023 Version Kindle Edition*	2%
15	Presenting and closing the Project	accuracy of presenting and closing the project	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	project based learning		**Materials:** Project Presentation and Conclusion **Bibliography:** *CA Partridge, The National Electrical Code (NEC) for Electrical Project Managers: A Rapid Guide to Learn the Basics: 2023 Version Kindle Edition*	5%
16	Carrying out Final Semester Examinations	Accuracy of Carrying out Final Semester Exams	**Criteria:** Assessment rubric **Form of Assessment** : Participatory Activities, Tests	Oral test		**Material:** Meeting material 8-15 **Reader:** *Darren Ashby , Electrical Engineering 101: Everything You Should Have Learned in School...but Probably Didn't, Newnes; 3rd edition, 2011*	30%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	36.5%
2.	Project Results Assessment / Product Assessment	48.5%
3.	Test	15%
		100%

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.