	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
Research methodology	2010103004	Compulsory Study Program Subjects	T=3	P=0	ECTS=6.72	1	May 10, 2023

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

Learning model: Project Based Learning

Program Learning Outcomes (PLO)

PLO study program which is charged to the course

Program Objectives (PO)

PO - 1	Able to master the latest electrical engineering system design methods through the process of preparing project plans

PLO-PO Matrix

P.O
PO-1

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																

Short Course Description: The research methodology course contains scientific processes regarding research stages, Research Methodology: An Introduction, Defining the Research Problem, Research Design, Sampling Design, Measurement and Scaling Techniques, Methods of Data Collection, Processing and Analysis of Data, Sampling Fundamentals, Testing Process , and Interpretation and Report Writing.

References

Main :

1. Creswell, J. W. (2009). Research Design: Qualitative, Quantitative, and Mixed Method Approaches. SAGE.
2. Dodig-Crnkovic, G. (2002). COMPUTER SCIENCE IN A THEORY OF SCIENCE DISCOURSE. Master Thesis in Computer Science. http://citeseerx.ist.psu.edu/viewdoc/download;jsessionid=664AECAC339E0C2AD06D8BAF52BCDD0E?, doi=10.1.1.12.5766&rep=rep1&type=pdf
3. Hong, L. Y. (2006). RESEARCH METHODS IN ENGINEERING AND SCIENCE. , http://www.wabri.org.au/postgrads/documents/RM sci_eng_notes/Eng_Leung.pdf
4. Kumar, R. (2005). Research methodology – A step-by-step guide for beginners. SAGE.
5. Liles, D.; Johnson, M.; Meade, L.; Underdown, D. (1995). Enterprise Engineering: A discipline?, Society for Enterprise Engineering (SEE) Conference, Orlando, FL, http://www.webs.twsu.edu/enteng/ENTENG1.html

Supporters:

1. Liles, D.; Johnson, M.; Meade, L.; Underdown, D. (1995). Enterprise Engineering: A discipline?, Society for Enterprise Engineering (SEE) Conference, Orlando, FL, http://www.webs.twsu.edu/enteng/ENTENG1.html

Supporting lecturer: Dr. Lilik Anifah, 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 understand Research Methodology: An Introduction	Students are able to explain Research Methodology in general according to the engineering field	**Criteria:** Assessment score 0-100 **Form of Assessment** : Participatory Activities	Problem Based Learning and DI 3 X 50		**Material:** Research Methodology: An Introduction **Bibliography:** *Dodig-Crnkovic, G. (2002). COMPUTER SCIENCE IN A THEORY OF SCIENCE DISCOURSE. Master Thesis in Computer Science. http://citeseerx.ist.psu.edu/...?, doi=10.1.1.12.5766&rep=rep1&type=pdf*	0%

2	Students are able to define Research Problems according to the case studies given	Students are able to define Research Problems according to the case studies given	**Form of Assessment** : Participatory Activities	Problem based learning 3 X 50		**Material:** Research Problem according to the case study provided. **Reference:** *Kumar, R. (2005). Research methodology – A step-by-step guide for beginners. SAGE.* **Material:** Research Problem **References:** *Hong, LY (2006). RESEARCH METHODS IN ENGINEERING AND SCIENCE. , http://www.wabri.org.au/... sci_eng_notes/Eng_Leung.pdf*	0%
3	Students are able to design research according to the literary studies that have been carried out	Students are able to design research according to the literary studies that have been carried out	**Criteria:** Assessment score 0-100	Project based learning 3 X 50			0%
4	Students are able to design research according to the literary studies that have been carried out	Students are able to design research according to the literary studies that have been carried out	**Criteria:** Assessment score 0-100	Project based learning 3 X 50		**Material:** research design according to literature studies that have been carried out. **Reference:** *Creswell, JW (2009). Research Design: Qualitative, Quantitative, and Mixed Method Approaches. SAGE.*	0%
5	Students are able to carry out Sampling Design from the research design that has been created	Students are able to carry out Sampling Design from the research design that has been created	**Criteria:** Assessment score 0-100	Project based learning 3 X 50		**Material:** Sampling Design **References:** *Dodig-Crnkovic, G. (2002). COMPUTER SCIENCE IN A THEORY OF SCIENCE DISCOURSE. Master Thesis in Computer Science. http://citeseerx.ist.psu.edu/...?, doi=10.1.1.12.5766&rep=rep1&type=pdf*	0%
6	Students are able to carry out measurement and Scaling Techniques	Students are able to carry out measurement and Scaling Techniques	**Criteria:** Assessment score 0-100 **Form of Assessment** : Participatory Activities	Project based learning 3 X 50		**Material:** measurement and Scaling Techniques **References:** *Creswell, JW (2009). Research Design: Qualitative, Quantitative, and Mixed Method Approaches. SAGE.*	5%
7	Students are able to carry out measurement and Scaling Techniques	Students are able to carry out measurement and Scaling Techniques	**Form of Assessment** : Test	Project based learning 3 X 50		**Material:** Measurement and Scaling Techniques **References:** *Dodig-Crnkovic, G. (2002). COMPUTER SCIENCE IN A THEORY OF SCIENCE DISCOURSE. Master Thesis in Computer Science. http://citeseerx.ist.psu.edu/...?, doi=10.1.1.12.5766&rep=rep1&type=pdf* **Material:** measurement and Scaling Techniques **References:** *Creswell, JW (2009). Research Design: Qualitative, Quantitative, and Mixed Method Approaches. SAGE.*	15%
8	Students complete a project in the form of a thesis proposal draft with results in accordance with the rules for writing a thesis proposal	Students complete a project in the form of a thesis proposal draft with results in accordance with the rules for writing a thesis proposal in chapter 1 and review research	**Criteria:** The assessment score is 0 - 100 according to the quality of the project **Form of Assessment** : Project Results Assessment / Product Assessment	Project based learning 3 X 50			30%
9	Students can practice implementing Methods of Data Collection in research according to their field	Students can implement Methods of Data Collection in research according to their field		Project based learning 3 X 50			0%
10	Students are able to choose Processing and Analysis of Data according to the field and cases that have been reviewed	Students are able to choose Processing and Analysis of Data according to the field and cases that have been reviewed		Project based learning 3 X 50			0%
11	Students are able to choose Processing and Analysis of Data according to the field and cases that have been reviewed	Students are able to choose Processing and Analysis of Data according to the field and cases that have been reviewed	**Form of Assessment** : Participatory Activities	Project based learning 3 X 50		**Material:** Processing and Analysis of Data according to the fields and cases that have been reviewed. **Literature:** *Hong, LY (2006). RESEARCH METHODS IN ENGINEERING AND SCIENCE. , http://www.wabri.org.au/... sci_eng_notes/Eng_Leung.pdf*	0%
12	Students are able to design a testing process for a thesis proposal draft	Students are able to design a testing process for a thesis proposal draft		Project based learning 3 X 50		**Material:** designing a testing process for a thesis proposal draft **References:** *Creswell, JW (2009). Research Design: Qualitative, Quantitative, and Mixed Method Approaches. SAGE.*	0%

13	designing the Testing Process for the thesis proposal draft		**Form of Assessment** : Participatory Activities	Discussion and presentation 3x50 minutes		**Material:** designing a testing process for a thesis proposal draft **References:** *Creswell, JW (2009). Research Design: Qualitative, Quantitative, and Mixed Method Approaches. SAGE.* **Material:** Testing Process **Bibliography:** *Dodig-Crnkovic, G. (2002). COMPUTER SCIENCE IN A THEORY OF SCIENCE DISCOURSE. Master Thesis in Computer Science. http://citeseerx.ist.psu.edu/...?, doi=10.1.1.12.5766&rep=rep1&type=pdf*	0%
14	Able to develop knowledge, technology and/or art in the field of electrical engineering or professional practice through research plans, to produce innovative and tested work	Active in discussions	**Criteria:** Assessment score 0-100 **Form of Assessment** : Participatory Activities	3x50 minute discussion		**Material:** designing a testing process for a thesis proposal draft **References:** *Kumar, R. (2005). Research methodology – A step-by-step guide for beginners. SAGE.*	5%
15	Able to develop knowledge, technology and/or art in the field of electrical engineering or professional practice through research plans, to produce innovative and tested work	Able to develop knowledge, technology and/or art in the field of electrical engineering or professional practice through research plans, to produce innovative and tested work	**Criteria:** Assessment score 0-100 **Form of Assessment** : Test	Discussion and presentation 3x50 minutes		**Material:** designing a testing process for a thesis proposal draft **References:** *Kumar, R. (2005). Research methodology – A step-by-step guide for beginners. SAGE.*	5%
16	Project presentation	Able to solve science, technology and/or arts problems in the field of electrical engineering through an inter or multidisciplinary approach through a prepared research plan.	**Criteria:** Assessment score 0-100 **Form of Assessment** : Project Results Assessment / Product Assessment, Test	Project presentation 3x50 minutes		**Material:** Research proposal/thesis **References:** *Creswell, JW (2009). Research Design: Qualitative, Quantitative, and Mixed Method Approaches. SAGE.* **Material:** Project presentation **Bibliography:** *Liles, D.; Johnson, M.; Meade, L.; Underdown, D. (1995). Enterprise Engineering: A discipline?, Society for Enterprise Engineering (SEE) Conference, Orlando, FL, http://www.webs.twsu.edu/...*	30%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	10%
2.	Project Results Assessment / Product Assessment	45%
3.	Test	35%
		90%

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.