	Universitas Negeri Surabaya Faculty of Engineering Civil Engineering Undergraduate Study Program	Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Civil Engineering Computer Applications	2220102189	Study Program Elective Courses	T=0	P=2	ECTS=3.18	5	July 17, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	.....	.....	Yogie Risdianto, 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 examines and provides testimony on problems in the world of civil engineering and identifies them logically to provide a solution in the form of a flowchart. Create algorithms from flowcharts and problems to make it easier to create programming languages so that students can create computer programming. Learning is carried out in a constructivist form and learning activities end by creating a program to solve civil engineering problems.

References

Main :

1. Atkinson, Kendal E. 1978. An Introduction to Numerical Analysis . Toronto: John Wiley &Sons
2. Atkinson, L.V., Harley, P.J. 1983. An Introduction to Numerical Methods with Pascal. Tokyo :Addison-Wesley Publishing Co
3. Djojodihardjo, H., Sudarmo, M.S. 1985. Pengantar Pemrograman Dengan Bahasa Fortran IV . Gramedia,Jakarta
4. Nasution, Amrinsyah. 1987. FORTRAN 77 . Erlangga, Jakarta

Supporters:

Supporting lecturer: Muhammad Imaduddin, 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 understand logically the concepts of mathematical applications in computer programming.	1. Explain the purpose of using computer applications in solving mathematics and civil engineering problems. 2. Explains the concept of logical thinking in mathematics and numbers.	**Criteria:** Full marks are obtained if you do all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation- Lecture 2 X 50		**Material:** concepts from mathematical applications in computer programming **Reader:** *Nasution, Amrinsyah. 1987. FORTRAN 77 . Erlangga, Jakarta*	4%
2	Students are able to understand logically the concepts of mathematical applications in computer programming.	1. Explain the purpose of using computer applications in solving mathematics and civil engineering problems. 2. Explains the concept of logical thinking in mathematics and numbers.	**Criteria:** Full marks are obtained if you do all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation- Lecture 2 X 50		**Material:** concepts from mathematical applications in computer programming **References:** *Atkinson, LV, Harley, PJ 1983. An Introduction to Numerical Methods with Pascal. Tokyo :Addison-Wesley Publishing Co*	4%
3	Students are able to understand numerical concepts and errors in mathematical applications, inherent errors, relative errors and absolute errors.	1. Explain the concept of logic in numerical. 2. Explain the logical concepts of inherent, relative and absolute error. 3. Can apply the concept of error logic to mathematics.	**Criteria:** Full marks are obtained if you do all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation- Lecture 2 X 50		**Material:** numerical concepts and errors in mathematical applications, inherent errors, relative errors and absolute errors **References:** *Djojodihardjo, H., Sudarmo, MS 1985. Introduction to Programming Using Fortran IV. Gramedia, Jakarta*	3%
4	Students are able to understand the function of flowcharts and create algorithms from flowcharts to identify cases of civil engineering problems.	1. Understand the function of the flowchart parts. 2. Using flowcharts to create a problem solution. 3. Explains how to create an algorithm from a flowchart.	**Criteria:** Full marks are obtained if the work report is sequential, clear, well presented, and can answer participants' questions well **Form of Assessment** : Project Results Assessment / Product Assessment	Introduction to flowcharts and algorithms. 2 X 50		**Material:** flowchart function and creating algorithms from flowcharts in identifying a case of civil engineering problems. **Reference:** *Atkinson, Kendal E. 1978. An Introduction to Numerical Analysis. Toronto: John Wiley & Sons*	4%
5	Students get to know several computer programming software and their advantages.	1. Explain the function and purpose of computer programs. 2. Explain the advantages and disadvantages of computer programming.	**Criteria:** Full marks are obtained if you do all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation - Group discussion - Case study 2 X 50		**Material:** Several computer programming software and their advantages **Reference:** *Djojodihardjo, H., Sudarmo, MS 1985. Introduction to Programming Using Fortran IV. Gramedia, Jakarta*	4%

6	Students are able to understand the syntax of Fortran software in the form of arithmetic calculations, keywords and writing formats in Fortran.	1. Explain the syntax in Fortran. 2. Explain the function of syntax operations in Fortran.	**Criteria:** Full marks are obtained if you do all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation- Lecture 2 X 50		**Material:** syntax in Fortran software in the form of arithmetic calculations, keywords and writing format in Fortran **Library:** *Djojodihardjo, H., Sudarmo, MS 1985. Introduction to Programming with Fortran IV. Gramedia, Jakarta*	4%
7	Students are able to understand and operate IF-END (logical expression), IF-THEN - END IF in the Fortran program.	- Explain the function of Logical IF. - Provide examples of Logical IF operations.	**Criteria:** Full marks are obtained if you practice all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation - Group discussion - Case study 2 X 50		**Material:** IF-END (logical expression), IF-THEN - END IF in the Fortran program **Library:** *Djojodihardjo, H., Sudarmo, MS 1985. Introduction to Programming with Fortran IV. Gramedia, Jakarta*	3%
8	Master the material from meetings 1 - 7 by taking the midterm exam (UTS)	Complete UTS questions on time and get maximum marks	**Form of Assessment** : Project Results Assessment / Product Assessment, Test	2 X 50			20%
9	Students are able to understand and operate the DO and LOOPING DO syntax in the Fortran program.	1. Explain the function of DO and LOOPING DO. 2. Provide examples of DO and LOOPING DO operations.	**Criteria:** Full marks are obtained if you practice all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation - Group discussion - Case study 2 X 50		**Material:** DO and LOOPING DO syntax in the Fortran program **Reference:** *Djojodihardjo, H., Sudarmo, MS 1985. Introduction to Programming with Fortran IV. Gramedia, Jakarta*	3%
10	Students are able to understand and operate ARRAY and DIMENSION syntax in the Fortran program	1. Explain the function of ARRAY and DIMENSION. 2. Provides examples of ARRAY and DIMENSION operations.	**Criteria:** Full marks are obtained if you practice all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation - Group discussion - Case study 2 X 50		**Material:** ARRAY and DIMENSION syntax in the Fortran program **Reference:** *Djojodihardjo, H., Sudarmo, MS 1985. Introduction to Programming with Fortran IV. Gramedia, Jakarta*	4%
11	Students are able to understand and operate the GOTO syntax in the Fortran program	1. Explain the function of GOTO. 2. Provides an example of a GOTO operation.	**Criteria:** Full marks are obtained if you do all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation - Group discussion - Case study 2 X 50		**Material:** GOTO syntax in the Fortran program **Reference:** *Djojodihardjo, H., Sudarmo, MS 1985. Introduction to Programming with Fortran IV. Gramedia, Jakarta*	4%

12	Students are able to understand and operate the GOTO syntax in the Fortran program	1. Explain the function of GOTO. 2. Provides an example of a GOTO operation.	**Criteria:** Full marks are obtained if you do all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation - Group discussion - Case study 2 X 50		**Material:** GOTO syntax in the Fortran program **Reference:** *Djojodihardjo, H., Sudarmo, MS 1985. Introduction to Programming with Fortran IV. Gramedia, Jakarta*	4%
13	Students are able to operate LOOPING DO and ARRAY syntax in the Fortran program	Provides an example of the combined operation of LOOPING DO and ARRAY	**Criteria:** Full marks are obtained if you practice all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation - Group discussion - Case study 2 X 50		**Material:** LOOPING DO and ARRAY syntax in the Fortran program **Reference:** *Djojodihardjo, H., Sudarmo, MS 1985. Introduction to Programming with Fortran IV. Gramedia, Jakarta*	3%
14	Students are able to operate LOOPING DO and GOTO syntax in the Fortran program.	Provides an example of the combined operation of LOOPING DO and GOTO.	**Criteria:** Full marks are obtained if you practice all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation - Group discussion - Case study 2 X 50		**Material:** LOOPING DO and GOTO syntax in the Fortran program **Reference:** *Djojodihardjo, H., Sudarmo, MS 1985. Introduction to Programming with Fortran IV. Gramedia, Jakarta*	3%
15	Students are able to operate the SUBROUTINE syntax in the Fortran program.	1. Explain the function of SUBROUTINE. 2. Provides an example of a SUBROUTINE operation.	**Criteria:** Full marks are obtained if you practice all the questions correctly and correctly **Form of Assessment** : Project Results Assessment / Product Assessment	- Presentation - Group discussion - Case study 2 X 50		**Material:** SUBROUTINE syntax in the Fortran program **Reference:** *Djojodihardjo, H., Sudarmo, MS 1985. Introduction to Programming with Fortran IV. Gramedia, Jakarta*	3%
16	UAS		**Form of Assessment** : Project Results Assessment / Product Assessment, Test				30%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Project Results Assessment / Product Assessment	75%
2.	Test	25%
		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** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities 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.