			Document Code
	Universitas Negeri Surabaya **Faculty of Economics and Business** **Economic Education Undergraduate Study Program**		

SEMESTER LEARNING PLAN

Courses		CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Economic math		8720303157	Compulsory Study Program Subjects	T=3	P=0	ECTS=4.77	1	July 17, 2024
AUTHORIZATION		SP Developer		Course Cluster Coordinator			Study Program Coordinator	
		....		....			Dr. Retno Mustika Dewi, S.Pd., M.Pd.	

Learning model	Case Studies

Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**	
	PLO-3	Develop logical, critical, systematic and creative thinking in carrying out specific work in their field of expertise and in accordance with work competency standards in the field concerned
	PLO-8	Able to communicate well orally and in writing in learning activities
	PLO-9	Able to solve problems in economic learning comprehensively in accordance with developments in science and technology
	PLO-14	Able to master the theoretical economic concepts needed to design and implement economic learning
	Program Objectives (PO)	
	PO - 1	Demonstrate a responsible attitude towards work independently and in groups
	PO - 2	Formulate and operate basic mathematical concepts in solving economic problems
	PO - 3	Utilizing information technology in solving economic problems procedurally
	PO - 4	Solving economic problems using a mathematical approach
	PLO-PO Matrix	

P.O	PLO-3	PLO-8	PLO-9	PLO-14
PO-1		✔		
PO-2	✔		✔	
PO-3			✔	
PO-4	✔			✔

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		✔					✔	✔	✔	✔					✔	

Short Course Description	This course contains basic mathematical concepts linked to micro and macro economic theory, including: Lines and Series, Linear Functions, Non-Linear Functions, Differentials, Partial Differentials and Integrals and their applications in the field of economics. The learning method is carried out in the form of lectures and questions and answers as well as using an inquiry approach, namely completing tasks and solving problems.

References	**Main :**
	1. Bumulo, Hussain. , Mursito, Djoko. 2011.Matematika untuk Ekonomi dan Aplikasinya. Bayumedia Publishing 2. Dumairy. 2010.Matematika Terapan untuk Bisnis dan Ekonomi. edisi ketiga.Yogyakarta:BPFE 3. Kalangi, Josep Bintang. 2014.MatematikaEkonomi & Bisnis edisi ke-3. Jakarta: SalembaEmpat4. Jacques, Ian . 2015.Mathematicsfor Economics and Business (8th Edition). Pearson
	Supporters:
	1. -

	Supporting lecturer	Amirusholihin, M.Sc. Wida Wulandari, M.Pd. Heni Purwa Pamungkas, S.Pd., M.Pd. Eka Indah Nurlaili, S.Pd., M.Pd.						
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	Analyzing series and their application in economics	1.Able to identify geometric series 2.Able to calculate and analyze business development 3.Able to identify arithmetic series 4.Able to calculate and analyze compound interest and population growth	**Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities	Approach: Case Based Learning Lectures and group discussions Presentation of case studies on row and series calculations Task 1: Students work on LKM 1 3 X 50	- -	**Material:** Understanding geometric series Understanding arithmetic series Simple interest Compound interest Business development Population growth projections **References:** *Dumairy. 2010. Applied Mathematics for Business and Economics. third edition. Yogyakarta: BPFE*	3%	
2	Analyzing series and their application in economics	1.Able to identify geometric series 2.Able to calculate and analyze business development 3.Able to identify arithmetic series 4.Able to calculate and analyze compound interest and population growth	**Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities	2nd week: Approach: Case Based Learning Lecture Calculating case study examples of 3 X 50 rows and series	- -	**Material:** Understanding geometric series Understanding arithmetic series Simple interest Compound interest Business development Population growth projections **References:** *Dumairy. 2010. Applied Mathematics for Business and Economics. third edition. Yogyakarta: BPFE*	5%	
3	Identifying the elements and forms of linear functions, compiling linear functions, calculating the values of linear function variables.	1.Able to identify types of functions 2.Be able to explain the form of linear functions 3.Able to compose linear function equations	**Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities	Week 3: Lecture Group discussion Assignment 3: presentation related to the topic of the linear function 3 X 50	- -	**Material:** Types of functions Linear function forms Linear function equations **Reference:** *Bumulo, Hussain. , Mursito, Djoko. 2011. Mathematics for Economics and its Applications. Bayumedia Publishing*	5%	

| 4 | Applying linear functions in microeconomics | 1. Able to construct demand and supply functions
2. Able to calculate market equilibrium prices and quantities
3. Able to calculate and analyze market balance after taxes and subsidies
4. Able to calculate and analyze cost, revenue, profit, loss and breakeven functions. | **Criteria:**
Scoring Guidelines

Form of Assessment :
Participatory Activities | Reading literature and listening to explanations, counting case examples, and practice questionsReading literature and listening to explanations, counting case examples, and practice questionsReading literature and listening to explanations, counting case examples, and practice questionsReading literature and listening to explanations, counting case examples, and practice questions Sunday 4th:
Lecture
Group discussion Task 4:
Calculating demand and supply functions Determining market balance Analyzing market balance after taxes and subsidies
3 X 50 | -
- | **Material:** Demand function Supply function Market balance Market balance after taxes and subsidies Cost function Total revenue Total cost Break event point **References:** *Kalangi, Josep Bintang. 2014.Mathematics, Economics & Business, 3rd edition. Jakarta: SalembaFour4. Jacques, Ian . 2015. Mathematics for Economics and Business (8th Edition). Pearson* | 5% |
| 5 | Applying linear functions in microeconomics | 1. Able to construct demand and supply functions
2. Able to calculate market equilibrium prices and quantities
3. Able to calculate and analyze market balance after taxes and subsidies
4. Able to calculate and analyze cost, revenue, profit, loss and breakeven functions. | **Criteria:**
Scoring Guidelines

Form of Assessment :
Participatory Activities, Practice/Performance | Reading literature and listening to explanations, counting case examples, and practice questionsReading literature and listening to explanations, counting case examples, and practice questionsReading literature and listening to explanations, counting case examples, and practice questionsReading literature and listening to explanations, counting case examples, and practice questions Sunday 5th:
Lecture
Group discussion Task 5:
Calculating the cost function Determine revenue, profit and loss and break even for a business activity
3 X 50 | -
- | **Material:** Demand function Supply function Market balance Market balance after taxes and subsidies Cost function Total revenue Total cost Break event point **References:** *Kalangi, Josep Bintang. 2014.Mathematics, Economics & Business, 3rd edition. Jakarta: SalembaFour4. Jacques, Ian . 2015. Mathematics for Economics and Business (8th Edition). Pearson* | 5% |

6	Applying linear functions in macroeconomics	1.Able to calculate and analyze the functions of consumption, savings and investment 2.Able to calculate and analyze transfer, tax and import functions 3.Able to calculate and analyze national income	**Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities	Reading literature and listening to explanations, counting case examples and practicing questions Reading literature and listening to explanations, counting case examples and practicing questions Reading literature and listening to explanations, counting case examples and practicing questions Week 6: Lecture Group discussion Task 6: Function analysis consumption, savings and investment 3 X 50	- -		**Material:** Consumption, savings and investment functions Transfer, tax and import functions National income **References:** *Kalangi, Josep Bintang. 2014.Mathematics, Economics & Business, 3rd edition. Jakarta: SalembaFour4. Jacques, Ian . 2015. Mathematics for Economics and Business (8th Edition). Pearson*	3%
7	Applying linear functions in macroeconomics	1.Able to calculate and analyze the functions of consumption, savings and investment 2.Able to calculate and analyze transfer, tax and import functions 3.Able to calculate and analyze national income	**Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities	Reading literature and listening to explanations, counting case examples, and practicing questionsReading literature and listening to explanations, counting case examples, and practicing questionsReading literature and listening to explanations, counting case examples, and practicing questions Week 7: Approach: case-based learning Group discussion Task 7: (LKM 3) Analyze transfer, tax and import functions Analyze national income 3 X 50	- -		**Material:** Consumption, savings and investment functions Transfer, tax and import functions National income **References:** *Kalangi, Josep Bintang. 2014.Mathematics, Economics & Business, 3rd edition. Jakarta: SalembaFour4. Jacques, Ian . 2015. Mathematics for Economics and Business (8th Edition). Pearson*	3%
8	UTS	UTS	**Criteria:** Scoring Guidelines **Form of Assessment** : Test	UTS 3 X 50	- -		**Material:** UTS **Library:** *Dumairy. 2010. Applied Mathematics for Business and Economics. third edition. Yogyakarta: BPFE*	20%

| 9 | Analyze the form of non-linear functions and their application in economics | 1. Able to analyze non-linear functions 2. Able to analyze non-linear supply and demand functions 3. Able to calculate and analyze market balance for non-linear functions 4. Able to calculate and analyze market balance after taxes and subsidies for non-linear functions 5. Able to calculate and analyze cost, revenue, BEP functions for non-linear functions | **Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities | Week 9: Lecture Group discussion Task 8: Analyzing non-linear functions Analyzing non-linear supply and demand functions 3 X 50 | - - | **Material:** Non-linear functions Non-linear supply and demand functions Non-linear market balance Market balance after taxes and subsidies for non-linear functions Cost function, total revenue and break even point **References:** *Bumulo, Hussain. , Mursito, Djoko. 2011. Mathematics for Economics and its Applications. Bayumedia Publishing* | 3% |
| 10 | Analyze the form of non-linear functions and their application in economics | 1. Able to analyze non-linear functions 2. Able to analyze non-linear supply and demand functions 3. Able to calculate and analyze market balance for non-linear functions 4. Able to calculate and analyze market balance after taxes and subsidies for non-linear functions 5. Able to calculate and analyze cost, revenue, BEP functions for non-linear functions | **Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities, Practice/Performance | Week 10: Lecture Group discussion Task 9: Analyze market balance after taxes and subsidies using non-linear functions Analyze cost function, total revenue, break event point 3 X 50 | - - | **Material:** Non-linear functions Non-linear supply and demand functions Non-linear market balance Market balance after taxes and subsidies for non-linear functions Cost function, total revenue and break even point **References:** *Bumulo, Hussain. , Mursito, Djoko. 2011. Mathematics for Economics and its Applications. Bayumedia Publishing* | 3% |

11	Analyzing the differential rule and its application in economics	1. Able to show differential rules 2. Able to calculate and analyze the elasticity of demand, supply and production 3. Able to calculate marginal costs, marginal revenue and marginal product 4. Able to calculate optimum value (maximum profit, minimum total cost, maximum revenue)	**Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities, Tests	Week 11: Lecture Group discussion Assignment 10: Differential rule Elasticity of demand and supply 3 X 50	- -	**Material:** Differential rule Elasticity of demand and supply Marginal cost, marginal revenue, and marginal product Optimum value **References:** *Kalangi, Josep Bintang. 2014.Mathematics, Economics & Business, 3rd edition. Jakarta: SalembaFour4. Jacques, Ian . 2015. Mathematics for Economics and Business (8th Edition). Pearson*	5%
12	Analyzing the differential rule and its application in economics	1. Able to show differential rules 2. Able to calculate and analyze the elasticity of demand, supply and production 3. Able to calculate marginal costs, marginal revenue and marginal product 4. Able to calculate optimum value (maximum profit, minimum total cost, maximum revenue)	**Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities, Tests	Week 12: Lecture Group discussion Task 11: Calculating marginal costs, marginal revenue, and marginal product Calculating the optimum value of 3 X 50	- -	**Material:** Differential rule Elasticity of demand and supply Marginal cost, marginal revenue, and marginal product Optimum value **References:** *Kalangi, Josep Bintang. 2014.Mathematics, Economics & Business, 3rd edition. Jakarta: SalembaFour4. Jacques, Ian . 2015. Mathematics for Economics and Business (8th Edition). Pearson*	5%
13	Analyzing the partial differential rule and its application in economics	1. Able to calculate partial differentials 2. Able to calculate and analyze maximum and minimum functions 3. Able to calculate the Lagrange function 4. Able to calculate and analyze cross elasticity 5. Able to calculate and analyze the maximum profit of 2 types of goods 6. Able to calculate and analyze the balance of production and consumption	**Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities	Week 13: Lecture Group discussion Task 12: Calculating partial differentials Analyzing maximum and minimum functions Calculating the 3 X 50 Lagrange function	- -	**Material:** Partial differential Maximum and minimum functions Lagrange function Cross elasticity Maximum profit of 2 types of goods Balance of production and consumption **Reader:** *Dumairy. 2010. Applied Mathematics for Business and Economics. third edition. Yogyakarta: BPFE*	5%

14	Analyzing the partial differential rule and its application in economics	1. Able to calculate partial differentials 2. Able to calculate and analyze maximum and minimum functions 3. Able to calculate the Lagrange function 4. Able to calculate and analyze cross elasticity 5. Able to calculate and analyze the maximum profit of 2 types of goods 6. Able to calculate and analyze the balance of production and consumption	**Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities	Week 14: Lecture Group discussion Task 13: Analyze the maximum profit of 2 types of goods Analyze the balance of production and consumption 3 X 50	- -	**Material:** Partial differential Maximum and minimum functions Lagrange function Cross elasticity Maximum profit of 2 types of goods Balance of production and consumption **Reader:** *Dumairy. 2010. Applied Mathematics for Business and Economics. third edition. Yogyakarta: BPFE*	5%
15	Analyze integral rules and apply them in economics	1. Able to calculate integrals 2. Able to calculate and analyze consumer and producer surplus	**Criteria:** Scoring Guidelines **Form of Assessment** : Participatory Activities	Week 15: Approach: case-based learning Group discussion Task 14: Calculating integrals Analyzing consumer and producer surplus 3 X 50	- -	**Material:** Integral Consumer and Producer Surplus **Reference:** *Dumairy. 2010. Applied Mathematics for Business and Economics. third edition. Yogyakarta: BPFE*	5%
16	UAS	UAS	**Criteria:** Scoring Guidelines **Form of Assessment** : Test	UAS 3 X 50	- -	**Material:** UAS **Literature:** *Kalangi, Josep Bintang. 2014.Mathematics, Economics & Business, 3rd edition. Jakarta: SalembaFour4. Jacques, Ian . 2015. Mathematics for Economics and Business (8th Edition). Pearson*	20%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	51%
2.	Practice / Performance	4%
3.	Test	45%
		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.