



**Universitas Negeri Surabaya
Faculty of Economics and Business
Bachelor of Management Study Program**

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																																																																			
Operational Research	6120103092	Compulsory Study Program Subjects	T=3	P=0	ECTS=4.77	3	February 15, 2020																																																																																			
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator																																																																																				
	Dr. Nadia Asandimitra Haryono, S.E., M.M.		Trias Madanika S.E., S.Pd., M.M.			Yuyun Isbanah, S.E., M.SM.																																																																																				
Learning model	Case Studies																																																																																									
Program Learning Outcomes (PLO)	PLO study program which is charged to the course																																																																																									
	PLO-14	(PLO 1) Graduates are able to master management theory as a whole																																																																																								
	Program Objectives (PO)																																																																																									
	PO - 1	C4. Students are able to choose the right Operational Research model to solve optimization problems.																																																																																								
	PO - 2	C5. Students are able to correctly interpret the results of optimization analysis for decision making.																																																																																								
	PO - 3	A5. Students are able to show thorough, broad-minded and intelligent character in Operational Research learning activities																																																																																								
	PLO-PO Matrix																																																																																									
		<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>P.O</td> <td colspan="6">PLO-14</td> </tr> <tr> <td>PO-1</td> <td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-2</td> <td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-3</td> <td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>						P.O	PLO-14						PO-1							PO-2							PO-3																																																													
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PO Matrix at the end of each learning stage (Sub-PO)																																																																																										
	<table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td rowspan="2">P.O</td> <td colspan="16">Week</td> </tr> <tr> <td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td> </tr> <tr> <td>PO-1</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-2</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> <tr> <td>PO-3</td> <td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td> </tr> </table>						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																
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Short Course Description	This course discusses the basic concepts of operations research and approaches to various deterministic modeling methods such as linear programming, transportation models, assignments, queuing systems, game theory and project management, as well as skillfully using analytical tools through management science software to produce decision making, especially those related to with the problem of company resource allocation. The learning application is through analysis of case examples in class. Lectures are carried out using a system of case study analysis, lectures, discussions, assignments and reflections. This course discusses the basic concepts of operations research and approaches to various deterministic modeling methods such as linear programming, transportation models, assignments, queuing systems, game theory and project management, as well as being skilled and using analytical tools through management science software to produce decision-making specifically related to the issue of company resource allocation. Learning applications through the analysis of case examples in class. Lectures are carried out with a system of case study analysis, lectures, discussions, assignments, and reflections.																																																																																									
References	Main :																																																																																									

1. Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.
2. Taylor III, Bernard W. 2004. Introduction to Management Science, 8th Ed. Pearson, Prentice Hall.
3. Mulyono, Sri. 2004. Operation Research. Jakarta: Lembaga Penerbitan FE UI.
4. Render, B. ; Stair, R. M. , Jr. ; and Hana, Michael E. 2009. Quantitative Analysis for Management, 10th Ed. Pearson, Prentice Hall.
5. Michael W. Carter, Camiller C. Price, & Ghaith Rabadi. 2019. Operational Research. A Practical Introduction Second Edition. CRC Press Taylor & Francis Group

Supporters:

Supporting lecturer
 Dr. Andre Dwijanto Witjaksono, S.T., M.Si.
 Dr. Nadia Asandimitra Haryono, S.E., M.M.
 Widyastuti, S.Si., M.Si.
 Tias Andarini Indarwati, S.E., M.M.
 Dwi Yuli Rakhmawati, S.Si., M.Si., Ph.D.
 Fandi Fatoni, S.Pd., M.SM.
 Syaifurrisal Wijaya Putra, S.E., M.M.
 Rasyidi Faiz Akbar, S.E., M.M.
 Muhammad Rizky Ramadhan, BBus., MITHM.

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	Explain the definition and use of OR	1.1. Explain the history of OR 1.1. Mention the benefits of OR 1.2. Explain the stages in OR	Criteria: holistic rubric Form of Assessment : Participatory Activities	Lectures and discussions 3 X 50		Material: definition and use of OR Reference: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	5%
2	Analyzing the preparation of mathematical models	2.1 Formulation of the General Model for Linear Programs 2.2 Formulation of the Standard Form Model for Linear Programs	Criteria: holistic rubric Form of Assessment : Participatory Activities, Practice/Performance	Lectures, discussions, problem solving 3 X 50		Material: preparation of mathematical models References: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	4%
3	Analyze problem solving based on models that have been prepared using graphical methods	3.1 Achieving the objective function that provides the most optimum value using graphical methods	Criteria: holistic rubric Form of Assessment : Participatory Activities	Lectures, discussions, problem solving 3 X 50		Material: graphic method References: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	4%
4	Analyze problem solving based on a model that has been prepared using the simple simplex method	4.1 Achieving the objective function that provides the most optimum value using the simple simplex method	Criteria: holistic rubric Form of Assessment : Participatory Activities	Lectures, discussions, problem solving 3 X 50		Material: simple simplex method References: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	4%
5	Analyzing problem solving based on a model that has been prepared using the Dual Simplex method	5.1 Achievement of the objective function that provides the most optimum value using the Dual Simplex method	Criteria: holistic rubric Forms of Assessment : Participatory Activities, Project Results Assessment / Product Assessment	Lectures, discussions, problem solving 3 X 50		Material: Dual Simplex method References: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	6%

6	Analyze assignment problem solving using algorithms with the aim of minimizing	6.1. Solving various optimal assignment problems using algorithms with the aim of minimizing	Criteria: holistic rubric Form of Assessment : Participatory Activities	Lectures, discussions, problem solving 3 X 50		Material: Bibliography Assignment : <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	4%
7	Analyzing assignment problem solving using algorithms with the aim of maximizing	6.1. Solving various optimal assignment problems using algorithms with the aim of maximizing	Criteria: holistic rubric Form of Assessment : Participatory Activities	Lectures, discussions, problem solving 3 X 50		Material: Bibliography Assignment : <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	4%
8	UTS		Form of Assessment : Project Results Assessment / Product Assessment, Test	3 X 50			15%
9	Analyzing transportation problem solving using the North West Corner, Stepping Stone, Least Corner, Vogels Approximation Method	Resolving various optimal transportation problems using the North West Corner, Stepping Stone, Least Corner, Vogels Approximation Method	Criteria: holistic rubric Form of Assessment : Participatory Activities	Lectures, discussions, problem solving 3 X 50		Material: North West Corner method, Stepping Stone, Least Corner, Vogels Approximation Method References: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	4%
10	Analyzing transportation problem solving using the North West Corner, Stepping Stone, Least Corner, Vogel's Approximation Method	10.1. Optimum resolution of various transportation problems using the North West Corner, Stepping Stone, Least Corner, Vogel's Approximation Method	Criteria: holistic rubric Form of Assessment : Participatory Activities	lectures, discussions and problem solving 3 x 50		Material: North West Corner method, Stepping Stone, Least Corner, Vogels Approximation Method References: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	4%
11	Analyzing transportation problem solving using the North West Corner, Stepping Stone, Least Corner, Vogel's Approximation Method	10.1. Optimum resolution of various transportation problems using the North West Corner, Stepping Stone, Least Corner, Vogel's Approximation Method	Criteria: holistic rubric Form of Assessment : Participatory Activities	lectures, discussions and problem solving 3 x 50		Material: North West Corner method, Stepping Stone, Least Corner, Vogels Approximation Method References: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	5%

12	Analyzing PERT/CPM project completion problem solving	12.1. Completion of optimal project completion problem solving using the PERT/CPM method	Criteria: holistic rubric Form of Assessment : Participatory Activities	lectures, discussions and problem solving 3 x 50		Material: completion of the PERT/CPM project Reference: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	4%
13	Analyzing PERT/CPM project completion problem solving	12.1. Completion of optimal project completion problem solving using the PERT/CPM method	Criteria: holistic rubric Form of Assessment : Participatory Activities	lectures, discussions and problem solving 3 x 50		Material: completion of the PERT/CPM project Reference: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	4%
14	Determining the optimal strategy using Game Theory	14.1. Completion of problem solving to determine the optimal strategy using the Game Theory method according to the conditions faced	Criteria: holistic rubric Form of Assessment : Participatory Activities	lectures, discussions and problem solving 3 x 50		Material: Game Theory Bibliography: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	4%
15	Analyze queuing problems	Completed queue problem solving according to the conditions faced	Criteria: holistic rubric Form of Assessment : Participatory Activities	Lecture, discussion, problem solving Lecture, discussion, problem solving Lecture, discussion, problem solving 3 X 50		Material: queue Reference: <i>Taha, Hamdy A. 2003. Operations Research: An Introduction, 7th Edition. Prentice Hall.</i>	4%
16	UAS		Form of Assessment : Test	3 X 50			25%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	55%
2.	Project Results Assessment / Product Assessment	10.5%
3.	Practice / Performance	2%
4.	Test	32.5%
		100%

Notes

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.