



**Universitas Negeri Surabaya**  
**Faculty of Engineering,**  
**Undergraduate Study Program in Informatics Engineering**

Document  
Code

**SEMESTER LEARNING PLAN**

<b>Courses</b>	<b>CODE</b>	<b>Course Family</b>	<b>Credit Weight</b>			<b>SEMESTER</b>	<b>Compilation Date</b>
Smart Web and Big Data	5520203104		T=3	P=0	ECTS=4.77	5	July 17, 2024
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>			<b>Study Program Coordinator</b>	
	.....		.....			Aditya Prapanca, S.T., M.Kom.	
<b>Learning model</b>	Project Based Learning						
<b>Program Learning Outcomes (PLO)</b>	PLO study program that is charged to the course						
	Program Objectives (PO)						
	PLO-PO Matrix						
		P.O					
<b>Short Course Description</b>	The Big Data Analysis course covers the concept of Big Data analysis, including Volume, Velocity, and Variety (3V), then there is predictive analysis, without any constraints on the size of the data being processed. There are technological advances in storing, processing and analyzing Big Data						
	References						
	<b>Main :</b>						
	<b>Supporters:</b>						
<b>Supporting lecturer</b>	Salamun Rohman Nudin, S.Kom., M.Kom. Paramitha Nerisafitra, S.ST., M.Kom.						
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	Understand the phenomena, opportunities and challenges of all activities related to Big Data	1. able to explain the background to the emergence of abundant data (Human, Social and Internet of Things) 2. able to explain the Nature of Big Data (Volume, Variety, Velocity, Value) 3. able to explain the Complexity of Big Data 4. able to explain the Big Data Framework based on the current state of the State of The Art. 5. Able to explain the data management cycle and data warehouse. 6. Case examples of extracting insights and patterns from Big Data in various application fields	<b>Form of Assessment :</b> Participatory Activities	lectures and discussions 3 X 50			25%
2	Understand the concepts, theories, framework of Data Analytics activities	1. Accuracy in expressing the data collection process 2. Accuracy in classifying types of data 3. Clarity in asking questions (scenarios) to the data 4. Understanding of complex systems formed by data (non singular solution)	<b>Form of Assessment :</b> Participatory Activities	1. Lecture 2. Discussion 3. Assignment: a. Looking for case studies regarding Data Analytics models with High Dimensional Data, Network Data and Text Data. b. Look for data sets that match the data model above 3 X 50			20%
3	Looking for Patterns and Insights from data 1	1. Ability to draw conclusions from data 2. Ability to find patterns from complex data 3. Ability to understand the concept of graph databases		1. Lecture 2. Discussion 3. Assignment: Look for relationships or patterns between data and actual events that are currently occurring, for example the spread of disease and other statistical data 3 X 50			0%
4	Understand the role of algorithms in Big Data management and the complexity of managing and calculating Big Data	1. Ability to understand the concept of algorithms in Big Data 2. Ability to understand the concept of complexity in Big Data 3. Ability to understand the concept of optimization / trade-off between processing speed and data complexity		1. Lecture 2. Discussion 3. Task: Understand how Facebook or Google works in processing data on a large scale (Big Data) in terms of algorithms and system complexity 3 X 50			0%

5	Understanding the 'Networked Data' phenomenon, examples of implementation, opportunities and challenges of 'social networks for business'	1. Ability to understand the concept and methodology of Social Network Analysis 2. Ability to create models, interpret metrics and visualization 3. Ability to operate software for Social Network Analysis method activities		1. Lecture 2. Discussion 3. Assignment: Search for Social Network data through crawling or available datasets, create models, create visualizations, calculate metrics, and interpret the results obtained 3 X 50			0%
6	Understanding the 'Networked Data' phenomenon, examples of implementation, opportunities and challenges of 'social networks for business'	1. Ability to understand the concepts and methodology of Social Network Analysis 2. Ability to create models, interpret metrics and visualize 3. Ability to operate software for Social Network Analysis method activities		1. Lecture 2. Discussion 3. Task: Search for Social Network data through crawling or available datasets, create models, create visualizations, calculate metrics, and interpret the results obtained 3 X 50			0%
7	Advanced Data Analytics Theory and Methods (Clustering)	1. Able to explain the concept: Naïve Bayes: 2. Decision Trees: 3. Diagnostics of Classifiers		Lecture Discussion Questions and answers 3 X 50			0%
8	able to complete questions and case studies related to pre-UTS material	accuracy in solving quiz questions		3 X 50			0%
9	Understand the concept of modeling phenomena from data, predictions from data and data mining concepts	1. Ability to understand data mining, the concept of pattern search and insight from data 2. Ability to simulate an event with data	<b>Form of Assessment :</b> Participatory Activities	1. Lecture 2. Discussion 3. Task: Carry out Monte Carlo simulations, create 3 X 50 training and test data			25%
10	Understand the concept of Data Mining: Regression	1. Ability to understand the concept of relationships between data 2. Ability to understand how regression methods/algorithms work 3. Ability to use data mining software		1. Lecture 2. Discussion 3. Tasks: Look for correlations from data, create a regression model, see the types of data for the 3 X 50 regression algorithm			0%
11	Understand the concept of Data Mining: Classification and Clustering	Able to explain the differences and similarities between classification and clustering		1. Lecture 2. Discussion 3 X 50			0%

12	Understand the concept of Data Mining: Association Rules Mining	1. Ability to understand the concepts of co-occurrence data, frequent itemsets, sequential patterns 2. Ability to create data association models 3. Ability to use data mining software		1. Lecture 2. Discussion 3. Task: Create a data association model using a data set from a 3 X 50 real world problem			0%
13	Big Data Challenges and Opportunities	Able to explain the results of case studies about Big Data opportunities in the real world	<b>Form of Assessment :</b> Project Results Assessment / Product Assessment	1. Lecture 2. Discussion 3. Assignment: case study of Big Data challenges and opportunities in the real world 3 X 50			30%
14	Big Data Technology and Tools 1	Able to explain the concept of data analysis in Big Data applications 1		1. Lecture 2. Discussion 3 X 50			0%
15	Big Data Technology and Tools 2	Able to explain the concept of data analysis in the Big Data 2 application		1. Lecture 2. Discussion 3 X 50			0%
16	UAS			3 X 50			0%

#### Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
1.	Participatory Activities	70%
2.	Project Results Assessment / Product Assessment	30%
		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** 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.
- 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.
- 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.
- 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.
- Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
- 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%.
- TM=Face to face, PT=Structured assignments, BM=Independent study.