	Universitas Negeri Surabaya **Faculty of Mathematics and Natural Sciences** **Physics Education Undergraduate Study Program**					**Document Code**

SEMESTER LEARNING PLAN

Courses		CODE		Course Family	Credit Weight			SEMESTER	Compilation Date
Statistics		8420302197			T=2	P=0	ECTS=3.18	3	July 17, 2024
AUTHORIZATION		**SP Developer**			**Course Cluster Coordinator**			**Study Program Coordinator**	
		....			....			Mita Anggaryani, M.Pd., Ph.D.	

Learning model	Case Studies
Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**
	Program Objectives (PO)
	PLO-PO Matrix
	<table><tr><td>P.O</td></tr></table>
	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	The Statistics course presents discussions on descriptive statistics, data distribution, middle measures, probability distributions and their properties, binomial distribution, poison distribution, hypergonic distribution, normal distribution, sampling distribution, statistical inference, interval estimation, hypothesis testing for one and two populations. population. Learning is carried out based on projects interspersed with discussion methods, questions and answers, assignments, matrix note strategies, summarizing, and drills.

References	**Main :**	
	1. Gilford, J.P Frucher, Fundamental statistics In physicology and Education, New york: Mc Graw Hill 2. Sudjana. 1996. Metode Statistik. Bandung: Penerbit Tarsito 3. Sudjana. 1983. Teknik Analisis Regresi dan Kolerasi. Bandung: penerbit Tarsito	
	Supporters:	
	1. Peter Bruce and Andrew Bruce, 2017, Practical Statistios for Data Scientists, USA; O Reilly Media, inc. 2. Weis, Neil A 2012. Elementary Statistics. United State of America Addison-Wesley 3. Bluman, Allan G. 2011, Elementary statistics: a step by step approach 8th ed, Mc. Graww Hill. 4. https://www.kdnuggets.com/2020/06/8-basic-statistics-concepts.html	

Supporting lecturer	Prof. Dr. Budi Jatmiko, M.Pd. Dr. Dwikoranto, M.Pd. Dr. Eko Hariyono, S.Pd., M.Pd. Prof. Nadi Suprapto, S.Pd., M.Pd., Ph.D. Nurita Apridiana Lestari, S.Pd., M.Pd. Muhammad Habibbulloh, 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	Understand the types of data, how to collect data, and be able to present data correctly according to interests	1. Distinguish between the meaning of statistics and statistics 2. Mention various types of statistical data 3. Distinguish between the meanings of population and sample 4. Mention three ways of collecting data 5. Mention three ways of checking data 6. Discuss how to present data	**Form of Assessment** : Participatory Activities	2 x 50 minutes		**Material:** Introduction to Statistics, Statistical Data, Population and Samples **Literature:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	3%
2	Create data presentations with frequency distribution lists and graphs	1. Create a frequency distribution list 2. Calculate relative frequency and cumulative frequency 3. Depicts histograms, polygons, and ogive 4. Explain population models	**Form of Assessment** : Participatory Activities, Portfolio Assessment	2 x 50 minutes		**Material:** Presentation of Statistical Data **References:** *Weis, Neil A 2012. Elementary Statistics. United States of America Addison-Wesley*	5%
3	Calculates the arithmetic mean, measure, harmonic, mode, quartile, decile, percentile, either for single data, or in the form of a frequency distribution list	1. Calculating the sample average or arithmetic average 2. Calculate the measuring average 3. Calculating the harmonic mean 4. Calculate the median mode 5. Calculate quartiles, deciles, and percentiles	**Form of Assessment** : Participatory Activities	2 x 50 minutes		**Material:** Descriptive Statistics **Bibliography:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	3%
4	Calculate interquartile, quartile deviation, average deviation, standard deviation, standard deviation, standard number and coefficient of variation	1. Calculate between quartile ranges, and quartile deviations 2. Calculate the average deviation 3. Calculating standard deviation or standard deviation 4. Calculate standard numbers and coefficient of variation	**Form of Assessment** : Participatory Activities	2 x 50 minutes		**Material:** Descriptive Statistics **Bibliography:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	3%
5	Describe and calculate probability theory, expectations	1. Defining opportunities 2. Mention the four rules of chance 3. Calculating expectations	**Form of Assessment** : Participatory Activities, Portfolio Assessment	2 x 50 minutes		**Material:** Opportunity Theory **Bibliography:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	3%

6	Calculates binomial and multinomial distributions, hypergeometric distribution, Poisson distribution, normal distribution, student distribution, Chi Square distribution, F distribution	1.Distinguish between binomial and multinomial distributions 2.Explain the hypergeometric distribution 3.Explain the Poisson distribution 4.Explain the normal distribution 5.Explain the distribution of students 6.Explain the Chi square distribution 7.Explain the F distribution	**Form of Assessment** : Participatory Activities	2 x 50 minutes		**Material:** Data Distribution **Library:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	3%
7	Describe and explain sampling techniques	1.Explain the reasons for sampling 2.Create a sampling plan 3.Mention 5 sampling methods to obtain a representative sample 4.Mentioning errors: sampling and non-sampling	**Form of Assessment** : Participatory Activities, Portfolio Assessment	2 x 50 minutes		**Material:** Sampling Techniques **Literature:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	3%
8	Midterm Exam/Sub Summative Exam	Applying statistical tests to problems in the field of learning	**Form of Assessment** : Participatory Activities	The written exam can be carried out offline or online in 2 x 50 minutes	The written exam can be carried out offline or online in 2 x 50 minutes		20%
9	Describe and estimate the average parameters, sample size differences	1.Identifying interpretations 2.Mention methods of estimating 3.Explain how to estimate 4.Calculating how to estimate 5.Determine the sample size	**Form of Assessment** : Participatory Activities			**Material:** Estimated Data **Library:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	3%
10	Describe and carry out prerequisite tests for normality, equality of two variants, homogeneity test	1.Applying a normality test to a set of data 2.Applying the equality test of two variants to a set of data 3.Applying the homogeneity of variance test to a number of populations	**Form of Assessment** : Participatory Activities, Portfolio Assessment	2 x 50 minutes		**Material:** Test Prerequisites **Literature:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	3%

11	Carrying out tests, average test hypotheses, two-party tests, one-party tests	1. Explain the steps for hypothesis testing 2. Carry out data tests to test the average hypothesis, two parties, the right side and the left side 3. Carry out data tests to test proportion hypotheses, two sides, right side, left side 4. Carry out data testing for variance testing 5. Carry out data tests for similarity and average tests 6. Carry out data tests for the equality test of two proportions 7. Carry out data tests to test the equality of two variants	**Form of Assessment** : Participatory Activities	2 x 50 minutes		**Material:** Hypothesis Testing **Reference:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	0%
12	Using the Chi, square statistical test for analysis of research data	Using Chi square analysis to: 1. Moltinum data proportion test, 2, Poisson average similarity test, 3. Independence test between two factors, 4. Binum distribution goodness-of-fit test, Poisson distribution, normal, 5. Normality test	**Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	2 x 50 minutes		**Material:** Chi Square Statistical Test **Reference:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	5%
13	Using variance analysis techniques for research data	Perform statistical analysis using variance analysis techniques	**Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Portfolio Assessment	2 x 50 minutes		**Material:** Variant Analysis Techniques **Literature:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	5%
14	Using regression analysis techniques to analyze research data	Carrying out statistical analysis using Regression analysis techniques: 1. Functional relationships between variables, 2. Free hand method, 3. Least squares method for regression, . Multiple linear regression, 5. Regression linearity test	**Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	2 x 50 minutes		**Material:** Regression Analysis Techniques **Literature:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	5%

15	Using regression analysis techniques to analyze research data	Carrying out statistical analysis using Regression analysis techniques: 1. Functional relationships between variables, 2. Free hand method, 3. Least squares method for regression, . Multiple linear regression, 5. Regression linearity test	**Form of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment	2 x 50 minutes		**Material:** Regression Analysis Techniques **Literature:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	5%
16	Final Semester Exam/Summative Exam	Applying statistical tests to problems in the field of learning	**Criteria:** Students get a maximum score of 100 if they can answer all questions correctly **Forms of Assessment** : Participatory Activities, Project Results Assessment / Product Assessment, Tests	The written exam can be carried out offline or online in 2 x 50 minutes	The written exam can be carried out offline or online in 2 x 50 minutes	**Material:** Statistical Tests **Literature:** *Sudjana. 1996. Statistical Methods. Bandung: Tarsito Publishers*	30%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	61.17%
2.	Project Results Assessment / Product Assessment	19.17%
3.	Portfolio Assessment	8.67%
4.	Test	10%
		99.01%

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.