



**Universitas Negeri Surabaya**  
**Faculty of Mathematics and Natural Sciences**  
**Biology Education Masters Study Program**

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>																																																																																																																						
Applied Statistics	1234502009	Compulsory Study Program Subjects	T=2 P=0 ECTS=4.48	2	January 20, 2023																																																																																																																						
<b>AUTHORIZATION</b>	<b>SP Developer</b>		<b>Course Cluster Coordinator</b>		<b>Study Program Coordinator</b>																																																																																																																						
	Dr. Muji Sri Prastiwi, M.Pd.		Prof. Dr. Dyah Hariani, M.Si.		Prof. Dr. Yuliani, M.Si.																																																																																																																						
<b>Learning model</b>	Case Studies																																																																																																																										
<b>Program Learning Outcomes (PLO)</b>	<b>PLO study program that is charged to the course</b>																																																																																																																										
	<b>PLO-6</b>	Able to demonstrate a responsible attitude towards work in their field of expertise by paying attention to academic ethics in carrying out their professional duties, and able to embody the character of faith, intelligence, independence, honesty, caring and toughness in daily behavior.																																																																																																																									
	<b>PLO-7</b>	Applying the concept of eduecopreneurship based on local wisdom and having a leadership spirit to support community independence in the era of the Industrial Revolution.																																																																																																																									
	<b>Program Objectives (PO)</b>																																																																																																																										
	<b>PO - 1</b>	Mastering the theories and applications of Biostatistics in the field of Biology Education by determining analysis techniques that are appropriate to the data through the use of information technology based on local wisdom																																																																																																																									
	<b>PO - 2</b>	Able to produce research that can be used for society and knowledge based on local wisdom that is recognized nationally and internationally																																																																																																																									
	<b>PO - 3</b>	Have the flow of thought and skills to make recommendations in implementing a research design in the field of Biology Education using Biostatistics adapted to the research topic to produce appropriate data analysis based on local wisdom																																																																																																																									
	<b>PO - 4</b>	Able to present research results in Biology Education that can be scientifically justified, expressed in seminars or write articles on both a national and international scale																																																																																																																									
	<b>PO - 5</b>	Have a responsible, objective attitude, pay attention to ethics in implementing the data collection and data analysis process in order to obtain the right conclusions																																																																																																																									
	<b>PLO-PO Matrix</b>																																																																																																																										
		<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>P.O</th> <th colspan="3">PLO-6</th> <th colspan="3">PLO-7</th> </tr> </thead> <tbody> <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> <tr><td>PO-4</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>PO-5</td><td></td><td></td><td></td><td></td><td></td><td></td></tr> </tbody> </table>					P.O	PLO-6			PLO-7			PO-1							PO-2							PO-3							PO-4							PO-5																																																																																	
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<b>PO Matrix at the end of each learning stage (Sub-PO)</b>																																																																																																																											
	<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th rowspan="2">P.O</th> <th colspan="16">Week</th> </tr> <tr> <th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th><th>7</th><th>8</th><th>9</th><th>10</th><th>11</th><th>12</th><th>13</th><th>14</th><th>15</th><th>16</th> </tr> </thead> <tbody> <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> <tr><td>PO-4</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-5</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> </tbody> </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																	PO-4																	PO-5																
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<b>Short Course Description</b>	This course aims to provide students with knowledge and understanding of the basic concepts of statistics which are widely applied in practice and the use of statistics-based software for research and application in the world of education based on local wisdom. This course examines the understanding and scope of the role of Biostatistics in the Field of Biology Education, Determining the appropriate type of data measurement in obtaining data, Descriptive Statistics, Concepts of inferential statistics, Test selection techniques using parametric and non-parametric statistical analysis techniques, as well as multivariate analysis methods, skills that necessary to utilize IT in analyzing data as well as providing opportunities for data analysts. This course is presented through theory, discussions, assignments, presentations and statistical practice as well as being able to make a proposal for a thesis linked to methods by collecting data, organizing, analyzing data and drawing appropriate conclusions based on data analysis.																																																																																																																										
<b>References</b>	<b>Main :</b>																																																																																																																										

<ol style="list-style-type: none"> <li>Ananda, R., Fadhli, M.. 2018. Statistik Pendidikan. Teori dan Praktik dalam Pendidikan. Medan: CV. Widya Puspita</li> <li>Kadir. 2017. Statistika Terapan: Konsep, Contoh dan Analisis Data dengan Program SPSS/Lisrel dalam Penelitian. Depok: Edisi Ketiga. Rajawali Pers</li> <li>Indra Jaya dan Ardat. 2013. Penerapan Statistik untuk Pendidikan. Bandung : Cetakan pertama. Citapustaka Media Perintis</li> <li>Montgomery, D.C. 2001. Design and Analysis of Experiments. 5th Edition. New York: John Wiley &amp; Sons, Inc.</li> <li>Wijaya, T., Budiman, S.. 2016. Analisis Multivariat untuk Penelitian Manajemen. Yogyakarta: Pohon Cahaya.</li> <li>Weiss, N.A.. 2017. Elementary Statistics. USA: 10th Edition. Pearson Education, Inc.</li> </ol>							
<b>Supporters:</b>							
<ol style="list-style-type: none"> <li>Sainab, Eva Puspitasari, Masyitha Wahid. (2022). Hubungan Penggunaan Internet sebagai Media Pembelajaran dengan Minat dan Hasil Belajar Kognitif Biologi Siswa. Bioma, Vol.4, No.1, Juni 2022, pp. 31–39.</li> <li>Sindi Suryani1, Lufri, Analisis Kesulitan Belajar Biologi Melalui Pembelajaran Daring dan Hubungannya dengan Hasil Belajar Siswa. Journal for Lesson and Learning Studies Volume 4, Number 3, 2021 pp. 364-369.</li> </ol>							
<b>Supporting lecturer</b>		Prof. Dr. Ir. Dyah Hariani, M.Si. Dr. Muji Sri Pratiwi, 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 the introduction to statistics in educational research and its application in learning	-	<b>Criteria:</b> -	• Lecture and discuss statistical material related to educational research based on local wisdom based on PPT Introduction to Applied Statistics and source books • Case study of biological education research based on local wisdom (2 x 50 minutes) 2 X 50		<b>Material:</b> Introduction to statistics in educational research <b>References:</b> Ananda, R., Fadhli, M.. 2018. Education Statistics. Theory and Practice in Education. Medan: CV. Widya Puspita	0%
2	Analyzing types of descriptive statistics in research in the field of education and their application in learning	1. Explain the principles of measuring central phenomena 2. Determining the size of the location and size of the deviation (Dispersion), 3. Determination of moment, Skewness, and Kurtosis.4. Applications using SPSS for Descriptive Statistics are presented in the form of tables, graphs, diagrams 5. Provide examples of the application of descriptive statistics with a data collection plan related to a wisdom-based biology thesis	<b>Criteria:</b> Analyze types of descriptive statistics in research in the field of education correctly  <b>Form of Assessment :</b> Participatory Activities	• Lecture and discuss statistical material on measures of centering phenomena, measures of location & deviation (Dispersion), moments, skewness, and kurtosis. • Practice applications using SPSS for Descriptive Statistics presented in the form of tables, graphs, or diagrams • Presentation and discussion by giving examples application of descriptive statistics with a data collection plan related to a wisdom-based biology thesis• Providing responses between students (2 x 50 minutes) 2 X 50		<b>Material:</b> Descriptive statistics <b>Reference:</b> Kadir. 2017. Applied Statistics: Concepts, Examples and Data Analysis with the SPSS/Lisrel Program in Research. Depok: Third Edition. Rajawali Press	5%
3	Analyzing normality tests and homogeneity tests and their application in learning	1. Explain the principles of normality and homogeneity testing 2. Practice testing normality and homogeneity using the SPSS3 program. Provide an example of the application of normality and homogeneity testing using the SPSS program with a data collection plan related to a biology education thesis based on local wisdom	<b>Criteria:</b> Students can analyze normality tests and homogeneity tests based on educational articles correctly	• Lecture and discuss normality and homogeneity testing based on PPT • Presentation of practical results of normality and homogeneity testing using the SPSS program • Representatives present normality and homogeneity testing using the SPSS program with a data collection plan related to a biology thesis based on local wisdom • Provide feedback between students (2 x 50 minutes) 2 X 50		<b>Material:</b> Normality test and homogeneity test <b>References:</b> Ananda, R., Fadhli, M.. 2018. Education Statistics. Theory and Practice in Education. Medan: CV. Widya Puspita	0%

4	Analyzing Parametric Statistics: T Test and its application in learning	<ol style="list-style-type: none"> <li>1.Explaining One Sample T-Test parametric statistical testing,</li> <li>2.Explains Independent Sample T-Test parametric statistical testing</li> <li>3.Explains paired T Test parametric statistical testing</li> <li>4.Testing practice using parametric statistics One Sample T-Test, Independent Sample T Test and Paired T Test with the SPSS program</li> <li>5.Provide an example of implementing the T Test using the SPSS program with a plan for collecting data related to local wisdom-based biology education research and provide conclusions</li> </ol>	<p><b>Criteria:</b> Students can analyze Parametric Statistics: T Test based on educational research articles correctly</p> <p><b>Form of Assessment :</b> Participatory Activities</p>	<p>Make a decision to determine whether the case from the biology learning example can be solved with the T test or not (2 x 50 minutes) 2 X 50</p>		<p><b>Material:</b> Parametric Statistics: T Test</p> <p><b>Reference:</b> <i>Kadir. 2017. Applied Statistics: Concepts, Examples and Data Analysis with the SPSS/Lisrel Program in Research. Depok: Third Edition. Rajawali Press</i></p>	5%
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5	Analyzing Parametric Statistics: One Way Anova Test using Completely Randomized Design and Randomized Group Design and its application in learning	<ol style="list-style-type: none"> <li>1.Explaining the One-Way Anova testing model</li> <li>2.Explaining the One Way Anava testing model in research using Completely Randomized Design (CRD)</li> <li>3.Explaining the One Way Anava testing model in research using Randomized Group Design (RAK)</li> <li>4.Practice testing the One Way Anava test model using RAL and RAK with the SPSS program</li> <li>5.Provide an example of the One Way Anava testing model in research with the application of RAL and RAK using the SPSS program with a data collection plan related to local wisdom-based biology education research and provide conclusions</li> </ol>	<p><b>Criteria:</b> Students can analyze data using the ANOVA test of data from educational research correctly</p> <p><b>Forms of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment</p>	<ul style="list-style-type: none"> <li>• Presentation and discussion of examples taken from articles</li> <li>• Compiling an example of a biology education research based on local wisdom related to the proposal plan using the Anava One Direction RAL or RAK testing model and analyzing it using the SPSS program</li> <li>• Presentation and discussion of an example of a biology education research based on local wisdom related with a proposal plan using RAL or RAK (1 x 50 minutes)</li> <li>• Visiting the website for online lectures</li> <li>• Presentation and discussion of the One Way Anava testing model using RAL and RAK whose material is taken from articles (1 x 50 minutes)</li> <li>2 X 50</li> </ul>		<p><b>Material:</b> Parametric Statistics: One Way Anova Test</p> <p><b>Library:</b> <i>Indra Jaya and Ardat. 2013. Application of Statistics to Education. Bandung: First printing. Pioneer Media Citapustaka</i></p>	5%
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6	Analyzing Parametric Statistics: Two Way Anova Test using Completely Randomized Design and Randomized Group Design and its application in learning	<ol style="list-style-type: none"> <li>1.Explaining the Two Way Anova testing model (Two Way Anova)</li> <li>2.Explaining the Two-Way Anava testing model research using a Completely Randomized Design (CRD)</li> <li>3.Explaining Two-Way Anava testing model research using Randomized Group Design (RAK)</li> <li>4.Practice testing the Two-Way Anava test model using RAL and RAK with the SPSS program</li> <li>5.Provide an example of Two-Way Anova testing model research with the application of RAL and RAK using the SPSS program with a data collection plan related to local wisdom-based biology education research and provide conclusions</li> </ol>	<p><b>Criteria:</b> Students can present the results of Parametric Statistics: Two-Way Anova Test based on educational articles correctly</p> <p><b>Form of Assessment :</b> Participatory Activities</p>	<ul style="list-style-type: none"> <li>• Presentation and discussion of examples taken from articles • Compiling an example of a biology education research based on local wisdom related to the proposal plan using the Two-Way AnavaRAL or RAK testing model and analyzing it using the SPSS program • Presentation and discussion of an example of a biology education research based on local wisdom related with a proposal plan for the Two-Way Anava test model using RAL or RAK (1 x 50 minutes) 2 X 50</li> </ul>		<p><b>Material:</b> Parametric Statistics: Two Way Anova Test</p> <p><b>References:</b> <i>Indra Jaya and Ardat. 2013. Application of Statistics to Education. Bandung: First printing. Pioneer Media Citapustaka</i></p>	5%
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7	Analyzing Nonparametric Statistics One Sample Test (Chi Square Test) and Two Independent Samples Test (Mann Whitney Test and its application in learning	<p>1.Explaining non-parametric statistical testing One Sample Test (Chi Square Test)</p> <p>2.Explain non-metric statistical testing Two Independent Samples Test (Mann Whitney Test)</p> <p>3.Testing practice using static non-parametric One Sample Test (Chi Square Test) and Two Independent Samples Test (Mann Whitney Test) with the SPSS program</p> <p>4.Provide an example of the application of testing using non-parametric statics One Sample Test (Chi Square Test) and Two Independent Samples Test (Mann Whitney Test) with the SPSS program with a plan for collecting data related to local wisdom-based biological research and provide conclusions</p>	<p><b>Criteria:</b> Students can present the results of the Nonparametric One Sample Test statistical analysis based on educational articles correctly.</p> <p><b>Forms of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment</p>	<p>• Presentation and discussion of examples taken from articles • Compile an example of local wisdom-based biology education research related to the proposal plan using non-parametric static testing One Sample Test (Chi Square Test) and Two Independent Samples Test (Mann Whitney Test) with SPSS program (1 x 50 minutes) 2 X 50</p>		<p><b>Material:</b> Nonparametric Statistics One Sample Test (Chi Square Test)</p> <p><b>References:</b> <i>Indra Jaya and Ardat. 2013. Application of Statistics to Education. Bandung: First printing. Pioneer Media Citapustaka</i></p>	5%
8	Midterm exam		<p><b>Form of Assessment :</b> Test</p>	2 X 50		<p><b>Material:</b> Descriptive Statistics, Concept of inferential statistics</p> <p><b>References:</b> <i>Ananda, R., Fadhli, M.. 2018. Education Statistics. Theory and Practice in Education. Medan: CV. Widya Puspita</i></p>	20%

9	Analyzing the types of nonparametric statistics Two Related Samples Test (Wilcoxon Test) and K-Independent Samples Test (Kruskal Wallis Test) and their application in learning	<ol style="list-style-type: none"> <li>1.Explains the types of non-parameter statistics using the Two Related Samples Test and K-Independent Samples Test</li> <li>2.Provide an example of the application of testing using the Wilcoxon Test and Kruskal Wallis Test in the SPSS program with a plan for collecting data related to local wisdom-based biology education research</li> <li>3.Testing practice using static non-parametric Wilcoxon Test and Kruskal Test with the SPSS program</li> <li>4.Provide an example of the application of testing using the non-parametric static Wilcoxon Test and Kruskal Test with the SPSS program with a data collection plan related to a biology thesis based on local wisdom and provide conclusions</li> </ol>	<b>Criteria:</b> -	<ul style="list-style-type: none"> <li>• Lecture and discuss the principles of non-parametric statistics based on PPT</li> <li>• Presentation of practical results of the Wilcoxon test and Kruskal Wallis test using the SPSS program</li> <li>• Representatives present the Wilcoxon test and Kruskal Wallis test using the SPSS program with plans for data collection related to local wisdom-based biology education research</li> <li>• Give responses between students (2 x 50 minutes)</li> <li>2 X 50</li> </ul>		<b>Material:</b> nonparametric statistics Two Related Samples Test (Wilcoxon Test) and K-Independent Samples Test (Kruskal Wallis Test) <b>References:</b> <i>Indra Jaya and Ardat. 2013. Application of Statistics to Education. Bandung: First printing. Pioneer Media Citapustaka</i>	0%
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10	Analyzing the Product Moment and Spearman Rank Correlation tests and their application in learning	1. Explain the Product Moment Correlation test and Spearman Rank2. Practice testing Product Moment Correlation and Spearman Rank using the SPSS3 program. Provide an example of the application of testing using the Product Moment Correlation Test and Spearman Rank with the SPSS program in connection with a plan for collecting biological education research data based on local wisdom and provide conclusions	<p><b>Criteria:</b> Students can present analysis of Product Moment Correlation and Spearman Rank tests based on educational articles well</p> <p><b>Form of Assessment :</b> Participatory Activities</p>	<ul style="list-style-type: none"> <li>Lecture and discuss the principles of Product Moment Correlation and Spearman Rank based on PPT</li> <li>Presentation of practical results of testing Product Moment Correlation and Spearman Rank using the SPSS program</li> <li>Representatives present testing Product Moment Correlation and Spearman Rank using the SPSS program with plans for collecting data related to educational research -Biology education based on local wisdom</li> <li>Provide feedback between students (2 x 50 minutes)</li> <li>2 X 50</li> </ul>		<p><b>Material:</b> Product Moment Correlation test and Spearman Rank</p> <p><b>Literature:</b> <i>Indra Jaya and Ardat. 2013. Application of Statistics to Education. Bandung: First printing. Pioneer Media Citapustaka</i></p> <hr/> <p><b>Material:</b> Product Moment Correlation test and Spearman Rank</p> <p><b>Readers:</b> <i>Sainab, Eva Puspitasari, Masyitha Wahid. (2022). The Relationship between Using the Internet as a Learning Media with Students' Biology Cognitive Interests and Learning Outcomes. Biome, Vol.4, No.1, June 2022, pp. 31-39.</i></p>	5%
11	Analyzing Regression tests and their application in learning	1. Explain the Simple Linear Regression test and Multiple Linear Regression2. Practice testing Simple Linear Regression and Multiple Linear Regression using the SPSS3 program. Provide an example of the application of Simple Linear Regression and Multiple Linear Regression testing with the SPSS program in connection with a plan for collecting local wisdom-based biology education research data and provide conclusions	<p><b>Criteria:</b> Students can present the results of regression test analysis based on educational articles well.</p> <p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	<ul style="list-style-type: none"> <li>Lecture and discuss the principles of Simple Linear Regression and Multiple Linear Regression based on PPT</li> <li>Presentation of practical results of Simple Linear Regression and Multiple Linear Regression testing using the SPSS program</li> <li>Representatives present Simple Linear Regression and Multiple Linear Regression testing using the program SPSS with data collection plans related to local wisdom-based biology education research</li> <li>Providing responses between students (2 x 50 minutes)</li> <li>2 X 50</li> </ul>		<p><b>Material:</b> Regression test</p> <p><b>Literature:</b> <i>Indra Jaya and Ardat. 2013. Application of Statistics to Education. Bandung: First printing. Pioneer Media Citapustaka</i></p> <hr/> <p><b>Material:</b> Regression test</p> <p><b>References:</b> <i>Sindi Suryani1, Lufri, Analysis of Difficulties in Learning Biology Through Online Learning and Their Relationship with Student Learning Outcomes. Journal for Lesson and Learning Studies Volume 4, Number 3, 2021 pp. 364-369.</i></p>	5%



12	Analyzing Multivariate Tests and their application in learning	1. Explain the principles of Multivariate testing models, for example Manova2. Multivariate testing practice, namely Manova, uses the SPSS3 program. Provide an example of the application of Manova testing with the SPSS program in connection with a plan to collect data for biology education research based on local wisdom and provide conclusions	<b>Criteria:</b> Can understand statistical analysis based on cases  <b>Form of Assessment :</b> Participatory Activities	Lecture and discuss Manova principles based on PPT Presentation of practical results of Manova testing using the SPSS program Representatives present Manova testing using the SPSS program with a plan for collecting data related to local wisdom-based biology educational research Giving feedback between students (2 x 50 minutes) Visiting the website for lectures online Presentation and discussion of local wisdom-based biology education research relating to a proposal plan using Multivariate testing, namely Manova with the SPSS program, the material of which is taken from the article (1 x 50 minutes) 2 X 50		<b>Material:</b> Multivariate Test <b>Literature:</b> Indra Jaya and Ardat. 2013. <i>Application of Statistics to Education</i> . Bandung: First printing. Pioneer Media Citapustaka	5%
13	Analyzing the validity and reliability of research instruments and their application in learning	1.Explain the important role of validity and reliability of research instruments 2.Creating scenarios for the validity and reliability of research instruments in local wisdom-based educational research learning 3.Present and discuss imaginary data from the results of the validity and reliability of local wisdom-based educational research instruments	<b>Criteria:</b> Can understand statistical analysis based on cases  <b>Forms of Assessment :</b> Participatory Activities, Project Results Assessment / Product Assessment	<ul style="list-style-type: none"> <li>Communicate/present imaginary results of the validity and reliability of research instruments based on scientific journals</li> <li>Discuss scenarios of the validity and reliability of research instruments in learning educational research based on local wisdom (1x50 minutes)</li> <li>Visit the web for online lectures</li> <li>Presentations and discussions (2x50 minutes)</li> </ul> 2 X 50		<b>Material:</b> validity and reliability of instruments <b>Reference:</b> Kadir. 2017. <i>Applied Statistics: Concepts, Examples and Data Analysis with the SPSS/Lisrel Program in Research</i> . Depok: Third Edition. Rajawali Press	5%
14	Analyzing Computer-Based Statistical Applications for Analysis of Learning Evaluation Results	1. Provide examples of computer-based statistical applications for analyzing learning evaluation results in learning	<b>Criteria:</b> Can understand statistical analysis based on cases  <b>Form of Assessment :</b> Participatory Activities	<ul style="list-style-type: none"> <li>Student representatives present and discuss the application of computer-based statistics for analyzing learning evaluation results) (1x50 minutes)</li> <li>Visit the website for online lectures</li> <li>Discussion about the application of computer-based statistics for analyzing learning evaluation results (1x50 minutes)</li> </ul> 2 X 50		<b>Material:</b> Computer Based Statistical Applications <b>Reference:</b> Kadir. 2017. <i>Applied Statistics: Concepts, Examples and Data Analysis with the SPSS/Lisrel Program in Research</i> . Depok: Third Edition. Rajawali Press	5%

15	Present the results of appropriate statistical analysis and their application in learning independently and responsibly	<p>1.Explain an example of using a biology education thesis proposal plan by applying appropriate statistical analysis based on research objectives according to both descriptive and inferential statistics</p> <p>2.Presentation of thesis proposal plan product with examples of imaginary data using appropriate statistical analysis in the form of descriptive statistics and inferential statistics for each student</p> <p>3.Responses from students and lecturers</p>	<p><b>Criteria:</b> Can understand statistical analysis based on cases</p> <p><b>Form of Assessment :</b> Project Results Assessment / Product Assessment</p>	<ul style="list-style-type: none"> <li>• Discuss the use of data analysis methods based on a thesis proposal for biology education based on local wisdom.</li> <li>• Present the product of the thesis proposal plan with examples of imaginary data using appropriate statistical analysis in the form of descriptive statistics and inferential statistics using the SPSS program.</li> <li>• Have a responsible attitude towards completing assignments given by the lecturer</li> <li>• Responses from students and lecturers (2x50 minutes)</li> </ul> <p>2 X 50</p>		<p><b>Material:</b> Application of analytical methods according to thesis research.</p> <p><b>References:</b> <i>Ananda, R., Fadhi, M.. 2018. Education Statistics. Theory and Practice in Education. Medan: CV. Widya Puspita</i></p>	5%
16	Final exams		<p><b>Form of Assessment :</b> Participatory Activities</p>	<p>-</p> <p>2 X 50</p>	-	<p><b>Material:</b> Multivariate analysis methods, skills needed to utilize IT in analyzing data as well as opportunities for data analysis.</p> <p><b>Bibliography:</b> <i>Indra Jaya and Ardat. 2013. Application of Statistics to Education. Bandung: First printing. Pioneer Media Citapustaka</i></p> <p><b>Material:</b> Multivariate analysis methods, skills needed to utilize IT in analyzing data as well as opportunities for data analysis.</p> <p><b>Bibliography:</b> <i>Indra Jaya and Ardat. 2013. Application of Statistics to Education. Bandung: First printing. Pioneer Media Citapustaka</i></p>	25%

**Evaluation Percentage Recap: Case Study**

No	Evaluation	Percentage
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1.	Participatory Activities	62.5%
2.	Project Results Assessment / Product Assessment	17.5%
3.	Test	20%
		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.