



Universitas Negeri Surabaya
Faculty of Sports and Health Sciences
Sports Science Doctoral Study Program

Document Code

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date																																																																																																				
Statistics for Sports Science	8900102058	Compulsory Study Program Subjects	T=2	P=0	ECTS=5.04	1	April 29, 2023																																																																																																				
AUTHORIZATION	SP Developer		Course Cluster Coordinator			Study Program Coordinator																																																																																																					
	A'yunin Sofro, Ph.D. Dr. Nur Ahmad Arief		A'yunin Sofro, Ph.D.			Prof. Dr. Agus Hariyanto, M.Kes.																																																																																																					
Learning model	Case Studies																																																																																																										
Program Learning Outcomes (PLO)	PLO study program which is charged to the course																																																																																																										
	PLO-11	Skilled in solving problems in the field of sports science using scientific and data-based principles (evidence based).																																																																																																									
	Program Objectives (PO)																																																																																																										
	PO - 1	Demonstrate a responsible attitude in completing sports science statistical analysis independently																																																																																																									
	PO - 2	Able to prepare scientific arguments and solutions, technology in sports science statistics based on a critical view of facts, concepts, principles or theories that can be justified scientifically and academically, and communicate them to the public																																																																																																									
	PO - 3	Skilled in analyzing problems in the field of sports science statistics using scientific and data-based principles (evidence based)																																																																																																									
	PO - 4	Develop theoretical and practical scientific principles well in solving problems that arise in the field of sports science statistics																																																																																																									
	PLO-PO Matrix																																																																																																										
		<table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>P.O</th> <th colspan="6">PLO-11</th> </tr> </thead> <tbody> <tr> <td>PO-1</td> <td colspan="6" style="text-align: center;">✓</td> </tr> <tr> <td>PO-2</td> <td colspan="6" style="text-align: center;">✓</td> </tr> <tr> <td>PO-3</td> <td colspan="6" style="text-align: center;">✓</td> </tr> <tr> <td>PO-4</td> <td colspan="6" style="text-align: center;">✓</td> </tr> </tbody> </table>						P.O	PLO-11						PO-1	✓						PO-2	✓						PO-3	✓						PO-4	✓																																																																						
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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;"> <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 style="text-align: center;">✓</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> </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																
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Short Course Description	Study of in-depth concepts regarding population and samples, matrix algebra, random vectors, multivariate normal distribution, principal component analysis, factor analysis, cluster analysis, multivariate regression analysis, MANOVA, discriminant analysis																																																																																																										
References	Main :																																																																																																										

		<p>1. Alvin C. Recher. 2002. Methods of Multivariate Analysis. Canada: John Wiley & Sons.[2] Richard A. Johnson and Dean W. Wichern. 2002. Applied Multivariate Statistical Analysis. New Jersey: Printice Hall. [3] Joseph F. Hair dkk, 2010. Multivariate Data Analysis A. Global Perspective. New Jersey: Pearson Prentice Hall.</p>					
		<p>Supporters:</p>					
		<p>1. Richard A. Johnson and Dean W. Wichern. 2002. Applied Multivariate Statistical Analysis. New Jersey: Printice Hall. 2. Joseph F. Hair dkk, 2010. Multivariate Data Analysis A. Global Perspective. New Jersey: Pearson Prentice Hall</p>					
Supporting lecturer		Dr. Nur Ahmad Arief, 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	1. Explain the basic concepts of statistics 2. Explain the concept of matrix algebra 3. Solve problems on matrix algebra 4. Explaining the normal distribution of the multivariate normal distribution (Solving problems regarding the normal distribution	1. Explain the basic concepts of statistics 2. Explain the concept of matrix algebra 3. Solve problems on matrix algebra 4. Explain the normal distribution and the multivariate normal distribution5. Solving problems regarding the normal distribution of the multivariate normal distribution	<p>Criteria:</p> <p>1.Accuracy of Formulation 2.Accuracy in practice</p> <p>Form of Assessment : Participatory Activities</p>	<p>Form: Response and tutorial</p> <p>Method: Problem based</p> <p>Assignment: Structured and independent 2 X 50</p>		<p>Material: Matrix algebra References: [1] Alvin C. Recher. 2002. Methods of Multivariate Analysis. Canada: John Wiley & Sons. [2] Richard A. Johnson and Dean W. Wichern. 2002. Applied Multivariate Statistical Analysis. New Jersey: Printice Hall. [3] Joseph F. Hair et al, 2010. Multivariate Data Analysis A. Global Perspective. New Jersey: Pearson Prentice Hall.</p>	5%
2	1. Explain the basic concepts of statistics 2. Explain the concept of matrix algebra 3. Solve problems on matrix algebra 4. Explaining the normal distribution of the multivariate normal distribution (Solving problems regarding the normal distribution	1. Explain the basic concepts of statistics 2. Explain the concept of matrix algebra 3. Solve problems on matrix algebra 4. Explain the normal distribution and the multivariate normal distribution5. Solving problems regarding the normal distribution of the multivariate normal distribution	<p>Criteria:</p> <p>1.Accuracy of Formulation 2.Accuracy in practice</p> <p>Form of Assessment : Participatory Activities</p>	<p>Form: Response and tutorial</p> <p>Method: Problem based</p> <p>Assignment: Structured and independent 2 X 50</p>		<p>Material: Matrix Algebra References: [1] Alvin C. Recher. 2002. Methods of Multivariate Analysis. Canada: John Wiley & Sons. [2] Richard A. Johnson and Dean W. Wichern. 2002. Applied Multivariate Statistical Analysis. New Jersey: Printice Hall. [3] Joseph F. Hair et al, 2010. Multivariate Data Analysis A. Global Perspective. New Jersey: Pearson Prentice Hall.</p>	5%

3	<p>1. Explain the meaning and concept of principal component analysis theory</p> <p>2. Applying principal component analysis in everyday life</p> <p>Solving problems related to principal component analysis with SPSS</p>	<p>1. Explain the meaning and concept of principal component analysis theory</p> <p>2. Apply principal component analysis in everyday life</p> <p>3. Solve problems related to principal component analysis with</p>	<p>Criteria:</p> <p>1.Accuracy of Formulation</p> <p>2.Accuracy in practice</p> <p>Form of Assessment :</p> <p>Participatory Activities</p>	<p>Form: Response and tutorial</p> <p>Method: Problem based</p> <p>Assignment: Structured and independent</p> <p>2 X 50</p>		<p>Material:</p> <p>principal component analysis</p> <p>References:</p> <p>[1] Alvin C. Recher. 2002. <i>Methods of Multivariate Analysis</i>. Canada: John Wiley & Sons.</p> <p>[2] Richard A. Johnson and Dean W. Wichern. 2002. <i>Applied Multivariate Statistical Analysis</i>. New Jersey: Printice Hall.</p> <p>[3] Joseph F. Hair et al, 2010. <i>Multivariate Data Analysis A. Global Perspective</i>. New Jersey: Pearson Prentice Hall.</p>	5%
4	<p>1. Explain the meaning and concept of principal component analysis theory</p> <p>2. Applying principal component analysis in everyday life</p> <p>Solving problems related to principal component analysis with SPSS</p>	<p>1. Explain the meaning and concept of principal component analysis theory</p> <p>2. Apply principal component analysis in everyday life</p> <p>3. Solve problems related to principal component analysis with</p>	<p>Criteria:</p> <p>1.Accuracy of formulation</p> <p>2.Accuracy in practice</p> <p>Form of Assessment :</p> <p>Participatory Activities</p>	<p>Form: Response and tutorial</p> <p>Method: Problem based</p> <p>Assignment: Structured and independent</p> <p>2 X 50</p>		<p>Material:</p> <p>principal component analysis</p> <p>References:</p> <p>[1] Alvin C. Recher. 2002. <i>Methods of Multivariate Analysis</i>. Canada: John Wiley & Sons.</p> <p>[2] Richard A. Johnson and Dean W. Wichern. 2002. <i>Applied Multivariate Statistical Analysis</i>. New Jersey: Printice Hall.</p> <p>[3] Joseph F. Hair et al, 2010. <i>Multivariate Data Analysis A. Global Perspective</i>. New Jersey: Pearson Prentice Hall.</p>	5%

5	1. Explain the meaning and concept of factor analysis theory 2. Applying factor analysis in everyday life 3. Solving problems related to factor analysis using a computer	1. Explain the meaning and concept of factor analysis theory 2. Apply factor analysis in daily life 3. Solving problems related to factor analysis with computers	Criteria: 1.Accuracy of formulation 2.Accuracy in practice Form of Assessment : Participatory Activities	Form: Response and tutorial Method: Problem based Assignment: Structured and independent 2 X 50	Material: factor analysis References: [1] Alvin C. Recher. 2002. <i>Methods of Multivariate Analysis</i> . Canada: John Wiley & Sons. [2] Richard A. Johnson and Dean W. Wichern. 2002. <i>Applied Multivariate Statistical Analysis</i> . New Jersey: Prentice Hall. [3] Joseph F. Hair et al, 2010. <i>Multivariate Data Analysis A. Global Perspective</i> . New Jersey: Pearson Prentice Hall.	5%
6	1. Explain the meaning and concept of factor analysis theory 2. Applying factor analysis in everyday life 3. Solving problems related to factor analysis using a computer	1. Explain the meaning and concept of factor analysis theory 2. Apply factor analysis in daily life 3. Solving problems related to factor analysis with computers	Criteria: 1.Accuracy of formulation 2.Accuracy in practice Form of Assessment : Participatory Activities	Form: Response and tutorial Method: Problem based Assignment: Structured and independent 2 X 50	Material: factor analysis References: [1] Alvin C. Recher. 2002. <i>Methods of Multivariate Analysis</i> . Canada: John Wiley & Sons. [2] Richard A. Johnson and Dean W. Wichern. 2002. <i>Applied Multivariate Statistical Analysis</i> . New Jersey: Prentice Hall. [3] Joseph F. Hair et al, 2010. <i>Multivariate Data Analysis A. Global Perspective</i> . New Jersey: Pearson Prentice Hall.	5%
7	1. Explain the meaning and concept of non-hierarchical cluster analysis theory 2. Applying non-hierarchical cluster analysis in everyday life 3. Solving problems related to non-hierarchical cluster analysis with computers	1. Explain the meaning and concept of non-hierarchical cluster analysis theory 2. Applying non-hierarchical cluster analysis in everyday life 3. Solving problems related to non-hierarchical cluster analysis	Criteria: 1.Accuracy of formulation 2.Accuracy in practice Form of Assessment : Participatory Activities	Form: Response and tutorial Method: Problem based Assignment: Structured and independent 2 X 50	Material: non-hierarchical clusters Bibliography: Richard A. Johnson and Dean W. Wichern. 2002. <i>Applied Multivariate Statistical Analysis</i> . New Jersey: Prentice Hall.	5%
8		Midterm exam		2 X 50		15%

9	1. Explain the meaning and concept of non-hierarchical cluster analysis theory (CLO-3)2. Applying non-hierarchical cluster analysis in everyday life (CLO-2)3. Solving problems related to non-hierarchical cluster analysis with computers (CLO-6)	1. Explain the meaning and concept of non-hierarchical cluster analysis theory2. Applying non-hierarchical cluster analysis in everyday life3. Solving problems related to non-hierarchical cluster analysis with computers	Criteria: 1.Accuracy of formulation 2.Accuracy in practice Form of Assessment : Participatory Activities	Form: Response and tutorial Method: Problem based Assignment: Structured and independent 2 X 50	Material: non-hierarchical clusters Bibliography: <i>Richard A. Johnson and Dean W. Wichern. 2002. Applied Multivariate Statistical Analysis. New Jersey: Printice Hall.</i>	5%
10	1. Explain the meaning and concept of non-hierarchical cluster analysis theory (CLO-3)2. Applying non-hierarchical cluster analysis in everyday life (CLO-2)3. Solving problems related to non-hierarchical cluster analysis with computers (CLO-6)	1. Explain the meaning and concept of non-hierarchical cluster analysis theory2. Applying non-hierarchical cluster analysis in everyday life3. Solving problems related to non-hierarchical cluster analysis with computers	Criteria: 1.Accuracy of formulation 2.Accuracy in practice Form of Assessment : Participatory Activities	Form: Response and tutorial Method: Problem based Assignment: Structured and independent 2 X 50	Material: non-hierarchical clusters Bibliography: <i>Richard A. Johnson and Dean W. Wichern. 2002. Applied Multivariate Statistical Analysis. New Jersey: Printice Hall.</i>	5%
11	1. Explain the meaning and concept of multivariate regression2. Applying multivariate regression in everyday life 3. Solving problems related to multivariate regression with computers (CLO-6)	1. Explain the meaning and concept of multivariate regression2. Applying multivariate regression in everyday life 3. Solving problems related to multivariate regression with computers	Criteria: 1.Accuracy of formulation 2.Accuracy in practice Form of Assessment : Participatory Activities	Form: Response and tutorial Method: Problem based Assignment: Structured and independent 2 X 50	Material: Regression Literature: <i>Joseph F. Hair et al, 2010. Multivariate Data Analysis A. Global Perspective. New Jersey: Pearson Prentice Hall</i>	5%
12	1. Explain the meaning and concept of multivariate regression2. Applying multivariate regression in everyday life 3. Solving problems related to multivariate regression with computers (CLO-6)	1. Explain the meaning and concept of multivariate regression2. Applying multivariate regression in everyday life 3. Solving problems related to multivariate regression with computers	Criteria: 1.Accuracy of formulation 2.Accuracy in practice	Form: Response and tutorial Method: Problem based Assignment: Structured and independent 2 X 50	Material: Regression Literature: <i>Joseph F. Hair et al, 2010. Multivariate Data Analysis A. Global Perspective. New Jersey: Pearson Prentice Hall</i>	5%
13	1. Explain the meaning and concept of manova 2. Apply manova in everyday life 3. Solve problems related to manova with a computer	1. Explain the meaning and concept of manova2. Applying Manova in daily life 3. Solving problems related to MANOVA with computers	Criteria: 1.Accuracy of formulation 2.Accuracy in practice Form of Assessment : Participatory Activities	Form: Response and tutorial Method: Problem based Assignment: Structured and independent 2 X 50	Material: Manova Reference: <i>Joseph F. Hair et al, 2010. Multivariate Data Analysis A. Global Perspective. New Jersey: Pearson Prentice Hall</i>	5%

14	1. Explain the meaning and concept of manova 2. Apply manova in everyday life 3. Solve problems related to manova with a computer	1. Explain the meaning and concept of manova2. Applying Manova in daily life 3. Solving problems related to MANOVA with computers	Criteria: 1.Accuracy of formulation 2.Accuracy in practice Form of Assessment : Participatory Activities	Form: Response and tutorial Method: Problem based Assignment: Structured and independent 2 X 50	Material: Manova Reference: <i>Joseph F. Hair et al, 2010. Multivariate Data Analysis A. Global Perspective. New Jersey: Pearson Prentice Hall</i>	5%
15	1. Explain the meaning and concept of manova 2. Apply manova in everyday life 3. Solve problems related to manova with a computer	1. Explain the meaning and concept of manova2. Applying Manova in daily life 3. Solving problems related to MANOVA with computers	Criteria: 1.Accuracy of formulation 2.Accuracy in practice Form of Assessment : Participatory Activities	Form: Response and tutorial Method: Problem based Assignment: Structured and independent 2 X 50	Material: Manova Bibliography: <i>Richard A. Johnson and Dean W. Wichern. 2002. Applied Multivariate Statistical Analysis. New Jersey: Printice Hall.</i>	5%
16			Form of Assessment : Project Results Assessment / Product Assessment			15%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Participatory Activities	60%
2.	Project Results Assessment / Product Assessment	15%
		75%

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.
- 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.

