Course: Statistics and Probability (TS 13361 / 2 credits

LEARNING OUTCOMES OF Statistics and Probability:

1. Students can understand the meaning of statistics, the use of statistics, the difference between descriptive and inferensial statistics, type of data and able to produce frequency distribution table and chart (S4, S9, S11, S12, S13, KU5, KK5, KK9);
2. Students can understand Probability Theory (S4, S9, S11, S12, S13, KU5, KK3 KK5, KK9);
3. Students can understand the characteristics of discrete and continuous variable and be able to implement them in a statistical analysis and be able to understand sample distribution (S4, S9, S11, S12, S13, KU5, KK3 KK5, KK9);
4. Students can create confidence internals and explain implication of result (S4, S9, S11, S12, S13, KU5, KK3 KK5, KK9);
5. Students can conduct hypothesis thesting and eplain implication of retult (S4, S9, S11, S12, S13, KU5, KK3 KK5, KK9);
6. Students can conduct linear regression and multiple linear regression analysis (S4, S9, S11, S12, S13, KU5, KK3 KK5, KK9).

FINAL TERM TEST (week 16)

[C2, C3, C4,C5] Students can conduct linear regression and multiple linear regression analysis (weeks 14-15)

[C2, C3, C4, C5] Students can conduct hypothesis thesting and explain implication of result (weeks 12-13)

[C2, C3, C4, C5] Students can create confidence internals and explain implication of result (weeks 9-11)

MID TERM TEST (week 8)

[C2, C3, C4,C5] Students can understand the characteristics of discrete and continuous variable and be able to implement them in a statistical analysis and be able to understand sample distribution (weeks 4-7)

[C2, C3, C4, C5] Students can understand Probability Theory (week 3)

[C2, C3, C4, C5] Students can understand the meaning of statistics, the use of statistics, the difference between descriptive and inferensial statistics, type of data and able to produce frequency distribution table and chart (weeks 1-2)

Garis Entry Behavior

UNTAR Universitas Tarumanagara	**TARUMANAGARA UNIVERSITY** **FACULTY OF ENGINEERING** **DEPARTMENT OF CIVIL ENGINEERING (Undergraduate Program)**

RENCANA PEMBELAJARAN SEMESTER (RPS)

Course Name	**Course Code**	**Credits**	**Semester**	**Date of Plan Preparation**
Statistics and Probability	TS 133061	2	I	28 April 2018

Authorization	**Course Leader**	**Basic Science Research Group Head**	**Head of Studi Program**
	Prof. Ir. Leksmono Suryo Putranto, MT., Ph.D	Dr. Widodo Kushartomo	Dr. Widodo Kushartomo

Learning Outcomes	**Learning Outcomes of Studi Program Assigned to the Course**	
	S4	Be able to work together in a multi discipline team with high attention and care to the community and environment.
	S9	Show responsibility to the job in his/ her experties individually and can be responsible to the achievement of organization work results.
	S11	Be able to conduct life-long learning.
	S12	Become a professional scientist and practitioners in civil engineering (behave and act ethically , critically, creatively, systematically and scientificlly, broad-minded, aesthetically).
	S13	Act and behave reciprocally between colleagues in organizational activity during planning and executing civil engineering work, and be able to argue orally and in writing and understand the laws.
	KU5	Be able to make appropriate decission in the context of problem solving in his/ her experties, based on data and information analysis.
	KK3	Be able to develop knowledge and inovation in civil engineering.
	KK5	Be able to develop knowledge and conduct innovation in civil enggineering.
	KK9	Be able to make decission based on data and information analysis, and be able to provide guidance in choosing some alternative solutions in civil engineering individually or as a team.
	Course Learning Outcomes	
	CPMK1	Be able to understand the meaning of statistics, the use of statistics, the difference between descriptive and inferensial statistics, type of data and able to produce frequency distribution table and chart (S4, S9, S11, S12, S13, KU5, KK5, KK9);
	CPMK2	Be able to understand Probability (S4, S9, S11, S12, S13, KU5, KK3 KK5, KK9);
	CPMK3	Be able to understand the characteristics of discrete and continuous variable and be able to implement them in a statistical analysis and be able to understand sample distribution (S4, S9, S11, S12, S13, KU5, KK3 KK5, KK9);
	CPMK4	Be able to create confidence internals and explain implication of result (S4, S9, S11, S12, S13, KU5, KK3 KK5, KK9);
	CPMK5	Be able to conduct hypothesis thesting and explain implication of result (S4, S9, S11, S12, S13, KU5, KK3 KK5, KK9);
	CPMK6	Be able to conduct linear regression and multiple linear regression analysis (S4, S9, S11, S12, S13, KU5, KK3 KK5, KK9).

Brief Descriptioni of the Course	In this course the student will learn the meaning and the use of statistics, descriptive vs inferential statistics, type of data, frequency distribution, central tendency, measure of dispersion, sample space, event, calculating sample points and events, calculating probability, free events, separate events, conditional probability, Bayes theory, characteristics of discrete and continuous variable, characteristics of discrete and continuous variable distribution, distribusi sampel, confidende interval of a mean, mean difference, mean of diference, a proportion, proportion difference, a variance, ratio of two variances, hypothesis testing of a mean, mean difference, mean of diference, a proportion, proportion difference, a variance, ratio of two variances, simple linear regression, and multiple linear regression.	
Learning Material	1. Introduction: Explanation regarding lecture plan/ lecture regulation/ test and marking system, learn the meaning and the use of statistics, descriptive vs inferential statistics, type of data, frequency distribution, central tendency, and measure of dispersion. 2. Sample space, event, calculating sample points and events, calculating probability, free events, separate events, conditional probability, and Bayes theory. 3. Characteristics of discrete and continuous variable, characteristics of discrete and continuous variable distribution. 4. Confidende interval of a mean, mean difference, mean of diference, a proportion, proportion difference, a variance, and ratio of two variances 5. Hypothesis testing of a mean, mean difference, mean of diference, a proportion, proportion difference, a variance, and ratio of two variances. 6. Simple linear regression, and multiple linear regression..	
References	1. Walpole, R.E and Myers, R.H., 1988, Probability and Statistics for Engineers and Scientist, New York: MacMillan Publshing, Co 2. Putranto, L.S. 2017, Statistika dan Probabilitas, Jakarta: Penerbit Indeks. 3. Supranto, J. 2000. Statistik, Teori dan Aplikasi Jilid 1, Edisi Ke-6, Jakarta, Penerbit Erlangga. 4. Supranto, J. 2001. Statistik, Teori dan Aplikasi Jilid 2, Edisi Ke-6, Jakarta, Penerbit Erlangga. 5. Miles, J., Shelvin, M., 2003, Applying Regression & Correlation. A Guide for Students and Researchers, London: SAGE Publications Ltd. 6. Lapin, L., 1983, Probability and Statistics for Modern Engineering, Massachussets: PWS Publishing. 7. Field, A. 2011. Discovering Statistics using SPSS. London: SAGE Publications Ltd. 8. Hisyam, A., 2013. Research Design, Jakarta: CV Riset Indonesia	
Learning Media	**Software:**	**Hardware :**
	Presentation software, spreadsheet, statistical analysis software	Laptop
Course Leader	Prof. Ir. Leksmono Suryo Putranto, MT., Ph.D	
Pre-requisite (if any)	-	

Weeks	Final Learning Outcomes	Learning Material	Learning Format and Method	Time Estimation	Students Learning Experience	Assessment		
						Criteria and Format		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1, 2	Be able to understand the meaning of statistics, the use of statistics, the difference between descriptive and inferensial statistics, type of data [C2, C3, C4, C5]	• Explanation regarding lecture plan/ lecture regulation/ test and marking system. • The meaning of statistics, the use of statistics, the difference between descriptive and inferensial statistics, type of data • Frequency distribution, central tendency, and measure of dispersion.	• Format: Lecture • Method: Discussion and statistical analysis exercise	**L:** **2x(2 x50')** **SA:** **2x(2x60')** **IA:** **2x(2 x60')**	Completing statistical analysis exercise of Statistics and Probability Book Chapter 1 at home and at exercise class.	**Criteria**: Accuracy, correctfulness and clas participation **Non-test format**: Statistical analysis exercise	Accuracy and correctfullness in statistical analysis exercise in class and class participation by means of initiative to ask and answer question.	**2,85-5,71**
3	Be able to understand probability theory [C2, C3, C4, C5,]	Ruang sampel, kejadian, meghitung titik sampel dan kejadian, menghitung peluang, kejadian bebas, kejadian terpisah peluang bersyarat, aturan Bayes.	• Format: Lecture • Method: Discussion and statistical analysis exercise	**L:** **2 x50'** **SA:** **2x60'** **IA:** **2 x60'**	Completing statistical analysis exercise of Statistics and Probability Book Chapter 2 at home an in exercise class.	**Criteria**: Accuracy, correctfulness and clas participation **Non-test format**: Statistical analysis exercise **Test Format:** Mid term test question.	Accuracy and correctfullness in statistical analysis exercise in class and in mid term test and class participation by means of initiative to ask and answer question.	**1,43-2,85** **6-8**
4, 5, 6, 7	Be able to understand	Characteristics of discrete and continuous	• Format: Lecture	**L:** **4x(2 x50')**	Reading Chapters 3 and Chapter 6 of Statistics	**Criteria**: Accuracy,	Accuracy and correctfullness	

Weeks	Final Learning Outcomes	Learning Material	Learning Format and Method	Time Estimation	Students Learning Experience	Assessment		
						Criteria and Format		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	characteristics of discrete and continuous variable, characteristics of discrete and continuous variable distribution. [C2, C3, C4, C5]	variable, characteristics of discrete and continuous variable distribution.	• Method: Discussion and statistical analysis exercise	**SA: 4x(2x60')** **IA: 2x(2 x60')**	and Probability Book (including tables in the appendixes) and Completing statistical analysis exercise of Statistics and Probability Book Chapter 4 and Chapter 5 at home an in exercise class.	correctfulness and clas participation **Non-test format**: Statistical analysis exercise **Test Format:** Mid term test question.	in statistical analysis exercise in class and in mid term test and class participation by means of initiative to ask and answer question.	**5,71-1,43** **24-32**
Mid Term Test (week 8)								
9, 10, 11	Be able to create a confidence interval and explain the implication of the result [C2, C3, C4,C5]	Confidende interval of a mean, mean difference, mean of diference, a proportion, proportion difference, a variance, and ratio of two variances	• Format: Lecture • Method: Discussion and statistical analysis exercise	**L: 3x(2 x50')** **SA: 3x(2x60')** **IA: 3x(2 x60')**	Completing statistical analysis exercise of Statistics and Probability Book Chapter 7 at home an in exercise class	**Criteria**: Accuracy, correctfulness and clas participation **Non-test format**: Statistical analysis exercise **Test Format:** Final term test question.	Ketepatan dan ketelitian dalam menjawab soal latihan di kelas maupun di UAS serta partisipasi di kelas berupa keaktifan bertanya dan menjawab pertanyaan	**8,57-17,14** **8,4-11,2**
12,13	Be able to conduct hypothesis testing and explain the implication of the result [C2, C3, C4,C5,]	Hypothesis testing of a mean, mean difference, mean of diference, a proportion, proportion difference, a variance, and ratio of two variances.	• Format: Lecture • Method: Discussion and statistical analysis exercise	**L: 3x(2 x50')** **SA: 3x(2x60')** **IA: 3x(2 x60')**	Completing statistical analysis exercise of Statistics and Probability Book Chapter 8 at home an in exercise class	**Criteria**: Accuracy, correctfulness and clas participation **Non-test format**: Statistical analysis exercise	Ketepatan dan ketelitian dalam menjawab soal latihan di kelas maupun di UAS serta partisipasi di kelas berupa keaktifan bertanya dan	**2,85-5,71**

Weeks	Final Learning Outcomes	Learning Material	Learning Format and Method	Time Estimation	Students Learning Experience	Assessment		
						Criteria and Format		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
						Test Format: Final term test question.	menjawab pertanyaan	**8,4-9,52**
14, 15,	Be able to conduct simple linear regression analysis and multiple linear regression analysis [C2, C3, C4,C5,]	Ssimple linear regression analysis and multiple linear regression analysis	• Format: Lecture • Method: Discussion and statistical analysis exercise	**L: 2x(2 x50')** **SA: 2x(2x60')** **IA: 2x(2 x60')**	Completing statistical analysis exercise of Statistics and Probability Book Chapters 9 and 10 at home an in exercise class	**Criteria**: Accuracy, correctfulness and clas participation **Non-test format**: Statistical analysis exercise **Test Format:** Final term test question.	Ketepatan dan ketelitian dalam menjawab soal latihan di kelas maupun di UAS serta partisipasi di kelas berupa keaktifan bertanya dan menjawab pertanyaan	**2,85-5,71** **12,9-17,2**
Mid Term Test (week 8)								