Module Description/Course Syllabi

Study Programme: Bachelor of Mathematics
Faculty of Mathematics and Natural Sciences
Universitas Andalas

1. *Course number and name*

MAT62251 Nonparametrics Statistics

2. *Credits and contact hours/Number of ECTS credits allocated*

3 SKS / 4,53 ECTS

3. *Instructors and course coordinator*

1. Mawanda Almuhayar, M.Sc
2. Dr. Maiyastri

4. *Textbook, title, author, and year*

1. S. Siegel, *Nonparametric Statistics for the Behavioral Sciences*. New York: McGraw-Hill, 1956.
2. S. Siegel, *Statistik Nonparametrik untuk Ilmu-Ilmu Sosial*, translated by Z. Suyuti dan L. Simatupang. Jakarta: Gramedia Pustaka Utama, 1992.

5. *Recommended reading and other learning resources/tools*

3. J. D. Gibbons, S. Chakraborti, *Nonparametric Statistical Inference*, 5th ed. Boca Raton, Florida: CRC Press, 2011.
4. Sugiyono, *Statistik Nonparametris untuk Penelitian.* Bandung: Alfabeta, 2018.

6. *Specific course information*

A. Brief description of the content of the course (catalog description)

In this course students will learn about statistical hypothesis testing methods that are not based on certain assumptions about distribution or statistical hypothesis tests carried out not on distribution parameters which include an introduction to nonparametric statistics, principles of statistical hypothesis tests, nonparametric statistical tests of one sample, nonparametric statistical tests of two related samples and two independent samples, Nonparametric statistical tests *k* related samples and *k* independent samples, and nonparametric correlation coefficients.
B. Prerequisites or co-requisites
1. MAT61151 Data Analysis
C. Indicate whether a required or elective course in the program
Elective course
D. Level of course unit (according to EQF: first cycle Bachelor, second cycle Master)
First cycle Bachelor
E. Year of study when the course unit is delivered (if applicable)
2nd year
F. Semester when the course unit is delivered
4th semester or even semester
G. Mode of delivery (face-to-face, distance learning)
Face-to-face learning
7. *Intended Learning Outcomes*
ILO-4: An ability to use concepts and fundamental techniques of mathematics in

solving simple mathematical problems.
ILO-5: An ability to formally and correctly prove a simple mathematical statement using facts and methods that have been studied.
ILO-6: Have ability data literacy and technology and can apply them in solving simple mathematical problems or other relevant fields.
8. *Course Learning Outcomes*
An ability to understand the principles of statistical hypothesis tests and the differences between parametric and nonparametric statistical tests in everyday life. (ILO-4, ILO-5)
An ability to conduct one-sample nonparametric statistical tests using various methods and interpret these tests based on events in everyday life. (ILO-4, ILO-5, ILO-6)
An ability to conduct two-samples nonparametric statistical tests using various methods and interpret these tests based on events in everyday life. (ILO-4, ILO-5, ILO-6)
An ability to conduct *k*-samples non-parametric statistical tests using various methods and interpret these tests based on events in everyday life. (ILO-4, ILO-5, ILO-6)
An ability to calculate the correlation coefficient using various methods and interpret the value of the correlation coefficient using data based on events in everyday life. (ILO-4, ILO-5, ILO-6)
9. *Brief list of topics to be covered*
1. Introduction to Nonparametric Statistics: Principles of Statistical Hypothesis Test, Parametric and Nonparametric Statistical Test. 2. One-Sample Test: Data Distribution Fit Test (Binomial Test, One-Sample Chi-Square Test, One-Sample Kolmogorov-Smirnov Test), Data Randomness Test (One-Sample Continuous Test). 3. Related Two-Samples Test: Proportion Difference Test (McNemar Test), Median Difference Test (Mark Test, Wilcoxon Ranking-Marked Test). 4. Independent Two-Samples Test: Proportion Difference Test (Fisher Exact Test, Independent Two-Samples Chi-Square Test), Median Difference Test (Median Test, Mann-Whitney U Test, Two-Samples Kolmogorov-Smirnov Test).

5. Related *k*-Samples Test: Proportion Difference Test (Cochran Q Test), Median Difference Test (Friedman Test or Two-Way ANOVA Ranking).
6. Independent *k*-Samples Test: Proportion Difference Test (Independent *k*-Samples Chi-Square Test), Median Difference Test (Extended Median Test, Kruskal-Wallis Test or One-Way Ranking ANOVA).
7. Correlation Coefficient: C Contingency Coefficient, Spearman Rank Correlation Coefficient, Kendall Rank Correlation Coefficient.

10. ***Learning and teaching methods***

Directed Learning, Teacher-Centered Learning, Case-Based Learning

11. ***Language of instruction***

Bahasa Indonesia and English

12. ***Assessment methods and criteria***

Summative Assessment :

1. Assignment: 20%
2. Mid-term exam: 25%
3. Final exam / final project: 55%