Module Description/Course Syllabi

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

1. *Course number and name*

MAT61252 Sampling Technique

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

3 sks / 4,53 ECTS

3. *Instructors and course coordinator*

1. Yudiantri Asdi, M.Sc; 2. Dr. Maiyastri

4. *Text book, title, author, and year*

1. Scheaffer, Mendenhall, Ott,1990. Elementary Survey Sampling. 4th edition. PWS-KENT. Boston
2. Levy PS. Lemeshow S. 1999. Sampling of Population, Methods, and Application. 3rd edition. John Wiley & Sons New York
3. Sampling Technique Modul

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

1. Cochran, W.G. 1977. Sampling Techniques. 3rd edition. J. Wiley & Sons. New York
2. Walpole, RE. Pengantar Statistika (translated). Gramedia, Jakarta
3. Article/book from other sources

6. *Specific course information*

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

This course discusses the methods to draw samples from the population, both probability and non-probability. This discussion will start by determining the population, the sampling frame, and the sample to be selected. In each probability

method, we will also discuss the estimation of population parameters (mean, total, and proportion) along with the estimation error. In addition, it will also discuss the determination of the sample size taken based on information about previous research. There will also be a discussion on estimating population size This course is conducted in a blended manner that can activate students. For some materials, lectures are conducted with a case-based approach, where students are given cases and asked to discuss how to solve the case. They collect data, which is then used as a basis for solving the case.
B. Prerequisites or co-requisites
MAT61151 Data Analysis
C. Indicate whether a required or elective course in the program
Elective
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)
3rd Year
F. Semester when the course unit is delivered
Odd Semester
G. Mode of delivery (face-to-face, distance learning)
Face to face

7. *Intended Learning Outcomes*
ILO-2: Possesses profound knowledge of the basic concept of mathematics PI-1: An ability to explain the basic concept of mathematics PI-2: An ability to give examples related to the basic concept of mathematics
ILO-4: An ability to use concepts and fundamental techniques of mathematics in solving simple mathematical problems PI-1: An ability to choose simple mathematical problems based on appropriate basic mathematical concepts and techniques PI-2: An ability to illustrate simple mathematical problems based on appropriate basic mathematical concepts and techniques PI-3: An ability to solve simple mathematical problems using the proper concept and mathematical fundamental techniques
ILO-6: An ability data literacy and technology and can apply them in solving simple mathematical problems or other relevant fields PI-1: Able to identify the right data and technology to solve simple mathematical problems or other fields PI-2: Able to use data and technology and apply them to solve simple mathematical statements or other areas PI-4: Able to conclude and interpret data processing results for simple mathematical problems or other fields
ILO-7: An ability to communicate effectively especially in the area of mathematics in with diverse communities PI-1: Able to convey ideas or study results orally, especially in the field of mathematics PI-2: Able to present ideas or study results in writing, especially in the field of mathematics PI-3: Able to respond to feedback given
ILO-8: An ability to work in a team PI-1: Able to actively participate in a team with full responsibility PI-2: Able to respond well to any feedback within the team PI-3: Able to complete tasks according to the set schedule PI-4: Able to adapt in a team
8. *Course Learning Outcomes*
1. Students have the ability to explain some concepts related to sampling techniques including the definition of sample, population, parameter, statistic, mean, variance, interval estimation, and others (ILO-2 PI-1; ILO-2 PI-2)

2. Students have the ability to explain the basic concepts of sampling elements of sampling, data collection methods (census and sampling) and their advantages and disadvantages, sampling techniques (probability and non-probability sampling), errors in sampling (sampling and non-sampling errors and measuring instruments in data collection (ILO-2 PI-1; ILO-2 PI-2).
3. Students have ability to draw samples using simple random sampling techniques, estimate the parameters of the population (mean, total population, and proportion), and determine the sample size to estimate population parameters (ILO-4 PI-1; ILO-4 PI-2; ILO-4 PI-3; ILO-6 PI-1; ILO-8 PI-2; ILO-6 PI-4)
4. Students have the ability to conduct stratified random sampling from inhomogeneous population conditions and estimate the parameters of the population (mean, total population, and proportion), and determine the sample size to estimate population parameters (ILO-4 PI-1; ILO-4 PI-2; ILO-4 PI-3; ILO-6 PI-1; ILO-8 PI-2; ILO-6 PI-4)
5. An ability to choose efficient estimation methods by utilizing information from other variables that are correlated with the variables to be estimated through difference, ratio, and regression estimation (ILO-4 PI-1; ILO-4 PI-2; ILO-4 PI-3; ILO-6 PI-1; ILO-8 PI-2; ILO-6 PI-4)
6. Students have the ability to draw samples from the population systematically and estimate the parameters of the population (mean, total population, and proportion), and determine the sample size to estimate population parameters (ILO-4 PI-1; ILO-4 PI-2; ILO-4 PI-3; ILO-6 PI-1; ILO-8 PI-2; ILO-6 PI-4)
7. Students have the ability to conduct random sampling from populations that form clusters, estimate the parameters of the population (mean, total population, and proportion), and determine the sample size to estimate population parameters (ILO-4 PI-1; ILO-4 PI-2; ILO-4 PI-3; ILO-6 PI-1; ILO-8 PI-2; ILO-6 PI-4)
8. Students have the ability to estimate sampling to estimate population size (ILO-4 PI-1; ILO-4 PI-2; ILO-4 PI-3; ILO-6 PI-1; ILO-8 PI-2; ILO-6 PI-4)
9. Students have the ability to conduct non-probability sampling and its application in conducting surveys, and explain the sources of bias (ILO-4 PI-1; ILO-4 PI-2; ILO-4 PI-3; ILO-6 PI-1; ILO-8 PI-2; ILO-6 PI-4)
10. Students have the ability to work in teams (ILO-8 PI-1; ILO-8 PI-2; ILO-8 PI-3; ILO-8 PI-4)
11. Students have the ability to communicate the results of discussions in a presentation and report (ILO-7 PI-1; CP-7 PI-2; ILO-7 PI-3)

9. *Brief list of topics to be covered*

1. Review some basic concepts of Statistical method
2. Basic concepts of sampling
3. Simple Random Sampling
4. Stratified Random Sampling
5. Rasio, Regression, and Difference Estimation
6. Systematic Random Sampling
7. Cluster Random Sampling
8. Estimation of Population Size
9. Non-probability Random Sampling

10. Learning and teaching methods

Case-based method and student center learning

11. Language of instruction

Bahasa

12. Assessment methods and criteria

Summative Assessment :
1. Mid-term exam: 20%
2. Final exam: 20%
3. Quiz: 5%

Formative Assessment:
1. Tasks: 5%
2. Case : 50%