

	Module Description/Course Syllabi Study Programme : Magister of Mathematics Faculty of Mathematics and Natural Sciences. Universitas Andalas
1. Course number and name	
MAT81232 Topic in Statistics 2	
2. Credits and contact hours/Number of ECTS credits allocated	
3 / 4,50 ECTS	
3. Instructors and course coordinator	
1. Prof. Dr. Ferra Yanuar, M.Sc	
2. Dr. Dodi Devianto	
4. Text book, title, outhor, and year	
<ul style="list-style-type: none"> a. Bain, L.J and Engelhardt, M. 1992. <i>Introduction to Probability and Mathematical Statistics</i>, second Edition. Duxbury Press, California. b. Bolstad, William M. 2007. <i>Introduction to Bayesian Statistics</i>, second Edition. John Wiley & Sons, New Jersey. c. Ntzoufras, I. 2009. <i>Bayesian Modeling Using WinBUGS</i>. John Wiley & Sons, Inc: Ney Jersey 	
5. Recommended reading and other learning resources/tools	
<ul style="list-style-type: none"> a. Rinne, H. 2009. <i>The Weibull Distribution A Handbook</i>. CRC Press: London. b. (Selected articles based on research topic) 	
6. Specific course information	
A. Brief description of the content of the course (catalog description)	
<p>The topics in this course are flexible, the material changes per semester according to current issues. The initial material is usually related to the implementation of Bayesian methods in the inference of discrete random variables and continuous random variables. The other materials are regarding the hybridizes Bayesian methods with other statistical methods. In implementing the method, we will use software such as SPSS, R and WinBUGS. The basic concepts of using the application will be explained at the meeting after midterm exam. To increase understanding and provide simple research experience to students, this lecture is also equipped with a final project, namely dissecting articles related to Bayesian hybrids using other methods and then presenting them individually.</p>	
B. Prerequisites or co-requisites	
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C. Indicate whether a required or elective course in the program	
Required	

<i>D. Level of course unit (according to EQF: first cycle Bachelor, second cycle Master)</i>
Second Cycle master
<i>E. Year of study when the course unit is delivered (if applicable)</i>
1st Year
<i>F. Semester when the course unit is delivered</i>
Second Semester
<i>G. Mode of delivery (face-to-face, distance learning)</i>
Mixture (Face to face and Distance learning)
<i>7. Intended Learning Outcomes</i>
<p>ILO-2: Mastering mathematical concepts and applications (real analysis, advanced linear algebra, and statistics) in solving complex mathematical problems. PI-1: Able to explain mathematical concepts (Real Analysis, Advanced Linear Algebra, and Statistics). PI-2: Able to identify complex mathematical problems.</p> <p>ILO-3: Able to master one or several mathematical problems in analysis, algebra, applied mathematics, statistics and combinatorics. PI-1: Able to identify theories used in related mathematical problems. PI-2: Able to apply theories for advancement in related fields (advanced theory). PI-3: Able to use advanced theory to solve related mathematical problems.</p> <p>ILO-4: Mastering scientific techniques and developing them in solving research problems through multidisciplinary or interdisciplinary approaches. PI-1: Able to apply mathematical techniques in research problem-solving. PI-2: Able to analyse research problems. PI-3: Able to formulate theorems/models and prove their validity. PI-4: Able to use various mathematical software to solve complex mathematical problems.</p> <p>ILO-5: Able to work and conduct research in mathematics and related fields of science by developing the latest issues independently or collaboratively and communicating them academically. PI-1. Capable of formally and correctly proving mathematical statements. PI-2. Able to employ relevant techniques for conducting research. PI-3. Capable of communicating research findings academically.</p>
<i>8. Course Learning Outcomes ex. The student will be able to explain the significance of current research about a particular topic.</i>
<ol style="list-style-type: none"> 1. Students are able to explain the concept of Bayesian analysis and use Bayesian inference on data distributions (discrete and continuous) (CPL-2: IK-1, IK-2, IK-3). 2. Students are able to use hybridization of the Bayesian method with several other statistical methods. 3. Students are able to use SPSS, R and WinBugs application software in the model

estimation process.

4. Students are able to reason intuitively and analytically and are able to express the results of their reasoning in writing, systematically and rigorously, both individually and in groups.

9. Brief list of topics to be covered

1. Bayesian inference on the distribution of discrete and continuous random variables.
2. Hybrid Bayesian method with other statistical methods (flexible material).
3. Basic concepts for using R and/or WinBugs applications in Bayesian analysis.

10. Learning and teaching methods

Presentation, Small Group Discussion, Directed Learning.

11. Language of instruction

Bahasa Indonesia

12. Assessment methods and criteria

Summative Assessment :

1. Assignment : 50%
2. Activeness : 10%
3. Midterm exam : 20%
4. Final exam : 20%

Formative Assessment:

1. Thumb up and thumb down
2. Minutes paper