Module Description/Course Syllabi

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

1. *Course number and name*
MAT61212 Application of Linear Algebra 1

2. *Credits and contact hours/Number of ECTS credits allocated*
3 sks / 4,53 ECTS

3. *Instructors and course coordinator*
1. Dr. Yanita; 2. Monika Rianti Helmi, M.Si; 3. Dr. Noverina Alfiany

4. *Text book, title, author, and year*
1. H. Anton & C. Rorres (2014). *Elementary Linear Algebra.* 11th edition. Wiley, USA 2. Related articles or publications

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

6. *Specific course information*
A. Brief description of the content of the course (catalog description)
This course will provide and discuss several applications of basic linear algebra theories, namely: systems of linear equations, matrices, determinants, and vectors in 2-space and 3-space. Some applications related to the concepts of linear algebra and matrices include problems network analysis, forest management, input-output leontif, assignment problems, game theory and cryptography.

B. Prerequisites or co-requisites
Elementary Linear Algebra, Calculus 1, Calculus 2
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)
2nd Year
F. Semester when the course unit is delivered
Odd Semester
G. Mode of delivery (face-to-face, distance learning)
Face to face and distance

7. Intended Learning Outcomes
ILO-3   An ability to identify, explain, and generalise simple mathematical   **PI-1**: An ability to identify simple mathematical problems   **PI-2**: An ability to explain simple mathematical problems

ILO-4

An ability to use concepts and fundamental techniques of mathematics in solving simple mathematical problems

PI-1: An ability to illustrate simple mathematical problems based on appropriate basic mathematical concepts and techniques

ILO-6

Have ability to 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

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 are able to identify real problems related to the system of linear equations, matrices, determinants and vectors in 2-space and 3-space

2. Students are able to choose methods, data, data collection techniques, and basic techniques to solve problems related to the system of linear equations, matrices, determinants and vectors in 2-space and 3-space

3. Students are able to use the concepts of the system of linear equations, matrices, determinants and vectors in 2-space and 3-space to solve real problems

4. Students are able to analyze and evaluate research results
5. Students are able to communicate the results of their research orally and in writing according to scientific principles.
6. Students are able to work in teams

9. *Brief list of topics to be covered*
Applications of systems of linear equations, matrices, determinants and vectors in 2-space and 3-space, such as : network analysis, forest management, input-output leontif, assignment problems, game theory and cryptography.

10. *Learning and teaching methods*
Project Based Learning

11. *Language of instruction*
Bahasa and English

12. *Assessment methods and criteria*
Summative Assessment :   1. Proposal (progress and report): 20%   2. Presentation: 20%   3. Project (progress, report, article and poster): 60%   **Formative Assessment**: