Module Description/Course Syllabi

Study Programme: Mathematics (Master Degree)
Faculty of Mathematics and Natural Sciences
Universitas Andalas

1. *Course number and name*

MAT81121 Advanced Real Analysis

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

3 sks /4,53 ECTS

3. *Instructors and course coordinator*

1. Dr. Haripamyu, 2. Dr. Shelvi Ekariani

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

Robert R. Strichartz, *The Way of Analysis*, rev. ed., Jones and Bartlett Learning, 2000

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

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6. *Specific course information*

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

This course begins by discussing how to construct a real number system through knowledge of the rational number system. Next, study the functions of one real-valued fruit related to continuity, derivatives, and integrals and sequences of functions.

B. Prerequisites or corequisites

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C. Indicate whether a required or elective course in the program

Required

D. Level of course unit (according to EQF: first cycle Bachelor, second cycle Master)

Second Cycle Master

E. Year of study when the course unit is delivered (if applicable)

1st year

F. Semester when the course unit is delivered

Odd semester/even semester

G. Mode of delivery (face-to-face, distance learning)

Face to face

7. *Intended Learning Outcomes*

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.
PI-3 : Able to solve complex mathematical problems.

ILO-3: Comprehensive mastery of one or several theories for development in the fields of analysis, algebra, applied mathematics, statistics, and combinatorial mathematics.
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.

8. *Course Learning Outcomes*

1. Students will be able to explain the concept of the rational number system, its definition, and their properties.
2. Students will be able to use the concept of the rational number system in constructing the real number system and its properties
3. Students will be able to generalize the concepts and properties of sets in real numbers.
4. Students are able to explain the concept of continuity of a function and identify the properties of continuity for a real-valued function.
5. Students are able to explain the concept of differential and integral calculus, identify the properties of derivatives and integral , and their relation to continuity.
6. Students can reason intuitively and analytically and can express the results of their reasoning in writing, systematically and rigorously.

9. *Brief list of topics to be covered*

Real number system, Continuous functions, Differential calculus, Integral calculus

10. Learning and teaching methods

Small group discussion, Directed learning

11. Language of instruction

Bahasa Indonesia

12. Assessment methods and criteria

Summative Assessment:
1. Tasks: 20%
2. Quiz: 20 %
3. Mid Semester: 30%
4. Final Semester: 30%

Formative Assessment: