



Module Description/Course Syllabi

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

1. Course number and name

MAT62225 Selected Topics in Analysis

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

3 sks / 4,53 ECTS

3. Instructors and course coordinator

1. Dr. Shelvi Ekariani; 2. Dr. Haripamyu

4. Textbook, title, author, and year

W. Cheney. (2001). *Analysis for Applied Mathematics*. 2nd edition. Springer, New York

5. Recommended reading and other learning resources/tools

E. Kreyszig. (1978). *Introductory Functional Analysis with Applications*. John Wiley & Sons. Inc.

6. Specific course information

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

Project-Based Learning (PjBL) is a teaching method that utilizes projects/activities as a medium. Students engage in exploration, assessment, interpretation, synthesis, and gathering information to produce various forms of learning outcomes.

<i>In this course, students learn about the concepts of convexity, convergence, compactness, and completeness in normed linear spaces; Geometry, orthogonality, linear functionals in Hilbert spaces, Basic approximation methods in analysis. Furthermore, students independently study articles related to the basic concepts covered.</i>
<i>B. Prerequisites or co-requisites</i>
Real Analysis 1, Real Analysis 2
<i>C. Indicate whether a required or elective course in the program</i>
Required
<i>D. Level of course unit (according to EQF: first cycle Bachelor, second cycle Master)</i>
First Cycle Bachelor
<i>E. Year of study when the course unit is delivered (if applicable)</i>
3 Year
<i>F. Semester when the course unit is delivered</i>
Even Semester
<i>G. Mode of delivery (face-to-face, distance learning)</i>
Face to face

<i>7. Intended Learning Outcomes</i>

<p>ILO-4: An ability to use concept and fundamental technique of mathematics in solving simple mathematical problems</p> <p>PI-1: An ability to illustrate simple mathematical problems based on appropriate basic mathematical concepts and techniques</p> <p>PI-2: An ability to illustrate simple mathematical problems based on appropriate basic mathematical concepts and techniques</p> <p>PI-3: An ability to solve simple mathematical problems using the proper concept and mathematical fundamental techniques</p>
<p>ILO-5: An ability formally and correctly proves a simple mathematical statement using facts and methods that have been studied</p> <p>PI-1: An ability to identify the formal structures and analogy forms in mathematics</p> <p>PI-2: An ability to use fact and apply methods in proving simple mathematical statement</p> <p>PI-3: An ability to present simple mathematical statement proof rigorously (sequentially and conscientious)</p> <p>PI-4: An ability to conclude or interpret result of the proving simple mathematical statement</p>
<p>ILO-7: An ability to communicate effectively especially in the area of mathematics in with diverse communities</p> <p>PI-1: Able to convey ideas or study results orally, especially in the field of mathematics</p> <p>PI-2: Able to present ideas or study results in writing, especially in the field of mathematics</p>
<p>ILO-8: An ability to work in team</p> <p>PI-1: Able to actively participate in a team with full responsibility</p> <p>PI-2: Able to respond well to any feedback within the team</p>
<p>8. Course Learning Outcomes</p>
<p>1. Ability to identify the basic concepts and problems related to Banach Spaces, Hilbert Spaces, and Fourier Transform. (ILO-4: PI-1, PI-2)</p>
<p>2. Ability to prove applicable properties. (ILO-5: PI-1, PI-2, PI-3)</p>

3. Ability to solve problems related to the applications of Analysis. (ILO-8: PI-1, PI-2)
4. Ability to present research reports and produce significant outcomes. (ILO-7: PI-1, PI-2)
5. Ability to work independently. (ILO-8: PI-1, PI-2)
9. Brief list of topics to be covered
Convexity, convergence, compactness, and completeness in normed linear spaces, geometry, orthogonality, linear functionals in Hilbert spaces, basic approximation methods in analysis, material covered in articles related to the basic concepts discussed
10. Learning and teaching methods
Directed Learning, Teacher Center Learning
11. Language of instruction
Bahasa and English

12. Assessment methods and criteria
Summative Assessment : 1. Mid-term exam: 20% 2. Project Presentation/ Final exam: 15% 3. Homework: 10% 4. Project Report: 55% Formative Assessment: