



**LEARNING PLAN SEMESTER
MATHEMATICS DEPARTMENT
FACULTY OF MATHEMATICS AND NATURAL SCIENCES**

Course Name	: Advanced Calculus	Semester : II	Workload : 4 SKS	Code Course : MAT1.61.5302
Programme Study	: Mathematics Education	Lecturer: Lecturer Team		
Faculty	: Mathematics and Natural Sciences			
Programme Learning Outcomes (PLO)				
PLO 1	: Able to recognize the formal structure of simple mathematical problems in basics and advanced mathematics to support the professional competence of teachers and further studies.			
PLO 10	: Able to show a responsible attitude in their own work and can be given responsibility for the achievement of group works			
Course Learning Outcomes (CO)				
CO 1	: Able to explain the concept of two and three dimension coordinates, multivariable function, partial derivatives, multiple integrals, sequences and series.			
CO 2	: Able to apply the concept of two and three dimension coordinates, multivariable function, partial derivatives, multiple integrals, sequences and series.			
CO 3	: Able to analyse the problems that connect to the concept of two and three dimension coordinates, multivariable function, partial derivatives, multiple integrals, sequences and series.			
CO 4	: Showing responsibility attitude towards works by self and by team works.			

Learning Matriks

Week	Sub CO (achievement ability after learning phase)	Reference	Assessment		Form of Learning, Method, Assignment		Score Percentage
			Criteria and Indicator	Form	Lecture	Online	
1	<p>Able to explain the concept of two dimension coordinates (Sub CO 1)</p> <p>Able to apply the concept of two dimension coordinates (Sub CO 2)</p> <p>Able to analyse the problems that connect to the concept of two dimension coordinates (Sub CO 3)</p> <p>Able to show responsibility attitude toward team works (Sub CO 4)</p>	<p>Topic : System Coordinates of Two Dimensional</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online</p> <p>Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning)</p> <p>Assignment: Exercise</p>	2%
2	<p>Able to explain the concept of three dimension coordinates (Sub CO 1)</p> <p>Able to apply the concept of three dimension coordinates</p>	<p>Topic : System Coordinates of Three Dimensional</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and</p>	<p>Form: Online</p> <p>Method: Synchronise or Asynchronies</p>	2%

	<p>(Sub CO 2)</p> <p>Able to analyse the problems that connect to the concept of three dimension coordinates (Sub CO 3)</p> <p>Able to show responsibility attitude toward team works (Sub CO 4)</p>	<p>Reference : [1], [2], and [3]</p>	<p>systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>		<p>Group Discussion</p> <p>Assignments: Exercise</p>	<p>of Expository and Group Discussion (via Zoom, Google Meet, e-learning) Assignment: Exercise</p>	
3	<p>Able to explain the concept of multivariable function (Sub CO 1)</p> <p>Able to apply the concept of multivariable function (Sub CO 2)</p> <p>Able to analyse the problems that connect to the concept of multivariable function (Sub CO 3)</p> <p>Able to show responsibility attitude toward team works (Sub CO 4)</p>	<p>Topic : Function of Two Variable and Its Graphs</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning) Assignment: Exercise</p>	2%
4	<p>Able to explain the concept of limit and continuity of multivariable function (Sub CO 1)</p> <p>Able to apply the concept of limit and continuity of multivariable function (Sub CO 2)</p> <p>Able to analyse the problems that connect to the concept of limit and continuity of multivariable function (Sub CO 3)</p> <p>Able to show responsibility attitude toward team works (Sub CO 4)</p>	<p>Topic : Limit and Continuity</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning) Assignment: Exercise</p>	2%
5	<p>Able to explain the concept of partial derivatives (Sub CO 1)</p> <p>Able to apply the concept of partial derivatives (Sub CO 2)</p> <p>Able to analyse the problems that connect to the concept of partial derivatives (Sub CO 3)</p> <p>Able to show responsibility attitude toward team works (Sub CO 4)</p>	<p>Topic : Partial Derivatives</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning) Assignment: Exercise</p>	2%
6	<p>Able to explain the concept of maximum and minimum value of multivariable function</p>	<p>Topic : Maximum and Minimum</p>	<p>Qualitative : Ability to understand, apply the concept and</p>	Exercise	<p>Form: Lecture</p>	<p>Form: Online Method:</p>	2%

	<p>(Sub CO 1)</p> <p>Able to apply the concept of maximum and minimum value of multivariable function (Sub CO 2)</p> <p>Able to analyse the problems that connect to the concept of maximum and minimum value of multivariable function (Sub CO 3)</p> <p>Able to show responsibility attitude toward team works (Sub CO 4)</p>	<p>Reference : [1], [2], and [3]</p>	<p>analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>		<p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning)</p> <p>Assignment: Exercise</p>	
7	<p>Able to explain the concept of double integrals of rectangular area (Sub CO 1)</p> <p>Able to apply the concept of double integrals of rectangular area (Sub CO 2)</p> <p>Able to analyse the problems that connect to the concept of double integrals of rectangular area (Sub CO 3)</p> <p>Able to show responsibility attitude toward team works (Sub CO 4)</p>	<p>Topic : Double Integral of Rectangular Area</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online</p> <p>Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning)</p> <p>Assignment: Exercise</p>	2%
8	<p>Able to explain the concept of double integrals of general area (Sub CO 1)</p> <p>Able to apply the concept of double integrals of general area (Sub CO 2)</p> <p>Able to analyse the problems that connect to the concept of double integrals of general area (Sub CO 3)</p> <p>Able to show responsibility attitude toward team works (Sub CO 4)</p>	<p>Topic : Double Integral of General Area</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online</p> <p>Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning)</p> <p>Assignment: Exercise</p>	2%
9	MID-TERM SEMESTER EXAM						35%
10	<p>Able to explain the concept of double integrals in polar coordinate (Sub CO 1)</p> <p>Able to apply the concept of double integral in polar coordinates (Sub CO 2)</p> <p>Able to analyse the problems that connect to the concept of double integrals in polar coordinates (Sub CO 3)</p> <p>Able to show responsibility attitude toward team works (Sub CO 4)</p>	<p>Topic : Double Integral in Polar Coordinates</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online</p> <p>Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning)</p> <p>Assignment: Exercise</p>	2%

11	<p>Able to explain the concept of application of double integral (<i>Sub CO 1</i>)</p> <p>Able to apply the concept of application of double integral (<i>Sub CO 2</i>)</p> <p>Able to analyse the problems that connect to the concept of application of double integral (<i>Sub CO 3</i>)</p> <p>Able to show responsibility attitude toward team works (<i>Sub CO 4</i>)</p>	<p>Topic : Application of Double Integral</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online</p> <p>Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning)</p> <p>Assignment: Exercise</p>	2%
12	<p>Able to explain the concept of triple integral in Cartesian coordinates (<i>Sub CO 1</i>)</p> <p>Able to apply the concept of triple integral in Cartesian coordinates (<i>Sub CO 2</i>)</p> <p>Able to analyse the problems that connect to the concept of triple integral in Cartesian coordinates (<i>Sub CO 3</i>)</p> <p>Able to show responsibility attitude toward team works (<i>Sub CO 4</i>)</p>	<p>Topic : Triple Integral in Cartesian Coordinates</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online</p> <p>Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning)</p> <p>Assignment: Exercise</p>	2%
13	<p>Able to explain the concept of sequences and series (<i>Sub CO 1</i>)</p> <p>Able to apply the concept of sequences and series (<i>Sub CO 2</i>)</p> <p>Able to analyse the problems that connect to the concept of sequences and series (<i>Sub CO 3</i>)</p> <p>Able to show responsibility attitude toward team works (<i>Sub CO 4</i>)</p>	<p>Topic : Sequences and Series</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online</p> <p>Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning)</p> <p>Assignment: Exercise</p>	2%
14	<p>Able to explain the concept of test convergences of series (<i>Sub CO 1</i>)</p> <p>Able to apply the concept of test of convergences of series (<i>Sub CO 2</i>)</p> <p>Able to analyse the problems that connect to the concept of test convergences of series (<i>Sub CO 3</i>)</p> <p>Able to show responsibility attitude toward team works (<i>Sub CO 4</i>)</p>	<p>Topic : Test Convergences of Series</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online</p> <p>Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning)</p> <p>Assignment: Exercise</p>	2%

15	<p>Able to explain the concept of power series (Sub CO 1)</p> <p>Able to apply the concept of power series (Sub CO 2)</p> <p>Able to analyse the problems that connect to the concept of power series (Sub CO 3)</p> <p>Able to show responsibility attitude toward team works (Sub CO 4)</p>	<p>Topic : Power Series</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online</p> <p>Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning)</p> <p>Assignment: Exercise</p>	2%
16	<p>Able to explain the concept of Taylor and Maclaurin series (Sub CO 1)</p> <p>Able to apply the concept of Taylor and Maclaurin series (Sub CO 2)</p> <p>Able to analyse the problems that connect to the concept of Taylor and Maclaurin series (Sub CO 3)</p> <p>Able to show responsibility attitude toward team works (Sub CO 4)</p>	<p>Topic : Taylor and Maclaurin Series</p> <p>Reference : [1], [2], and [3]</p>	<p>Qualitative : Ability to understand, apply the concept and analyze the problems to solve it mathematically and systematically.</p> <p>Quantitative: Score of the true answer in written test.</p>	Exercise	<p>Form: Lecture</p> <p>Method: Expository and Group Discussion</p> <p>Assignments: Exercise</p>	<p>Form: Online</p> <p>Method: Synchronise or Asynchronies of Expository and Group Discussion (via Zoom, Google Meet, e-learning)</p> <p>Assignment: Exercise</p>	2%
FINAL SEMESTER EXAM							35%

Reference

- [1] Purcell, Edwin J., Dale Varberg, dan Steven E. Rigdon. Kalkulus Jilid I dan II, edisi Sembilan, Alih Bahasa: I Nyoman Susila, Ph.D. Jakarta: Erlangga.
- [2] Spiegel, M. H, (1999), Analisis Vektor (Seri Buku Schaum), Erlangga, Jakarta.
- [3] Leithold, L (1991). Kalkulus dan Ilmu Ukur Analitik, Erlangga, Jakarta.