UNIVERSITAS NEGERI PADANG
FAKULTAS MATEMATIKA DAN ILMU PENGETAHUAN ALAM
JURUSAN MATEMATIKA, PROGRAM STUDI PENDIDIKAN MATEMATIKA
Kampus Utama Universitas Negeri Padang.
Jalan Prof. Dr. Hamka Air Tawar Padang, Sumatera Barat
Telepon: +62 751 7053902, Fax: +62 751 7055628
Email: matematika@fmipa.unp.ac.id

Bachelor of Mathematics Education **MODULE HANDBOOK**

Module name:	Advanced Calculus
Module level, if applicable:	Bachelor
Code:	MAT1.61.2301
Sub-heading, if applicable:	-
Classes, if applicable:	Advanced Calculus
Semester:	3th (third)
Module coordinator:	Prof. Dr. Yerizon, M.Si.
Lecturer(s):	Prof. Dr. Yerizon, M.Si., and Team
Language:	Bahasa Indonesia and English
Classification within the curriculum:	Study Program Compulsory Course
Teaching format / class hours per week during the semester:	Teaching format: • Lectures by Problem Based Learning with method such as Explanation, Group and Class Discussion. • Structured Assignment • Independent Activities • Practice 3 x 170 minutes = 510 minutes = 8.50 hours
Workload:	16 weeks per semester include mid test consisting of: • 2.50 hours lectures (3 x 50 minutes) per week, • 3 hours structured assignments (3x 60 minutes) per week, • 3 hours independent activities (3 x 60 minutes) per week • 2.83 hours practice (1 x 170 minute) per week 16 x 170 x 4 = 10880 minute = 181.33 hours = 6.04 ECTS
Credit points:	4 SKS (6.04 ECTS)
Prerequisite's course(s):	Calculus, Basic Algebra and Trigonometry
Course outcomes:	After taking this course the students have ability to: CO1: explain the concept of two- and three-dimension coordinates, multivariable function, partial derivatives, multiple integrals, sequences and series. CO2: apply the concept of two- and three-dimension coordinates, multivariable function, partial derivatives, multiple integrals, sequences & series.

	CO3: analyze the problems that connect to the concept of two- and three-dimension coordinates, multivariable function, partial derivatives, multiple integrals, sequences & series. CO4: Showing responsibility attitude towards works by self and by team works.
Content:	This course discusses: 1. The Cartesian R^2 and polar coordinate system, and graphs of polar equations 2. The Cartesian Coordinate System at R^3 3. The Functions of Two Variables and Their Graphs 4. Limits and Continuity 5. Partial Derivatives and their Properties 6. Tangents plane, maximum and minimum values 7. Double Integral over a rectangular area 8. Double Integral over the general area 9. Double Integral in Polar Coordinate System 10. The Application of Double Integral 11. Triple Integral in Cartesian Coordinates 12. Infinite sequences and series and their characteristic 13. About the Convergence Test of Series and the characteristic 14. Rank Series and the characteristic. 15. Taylor and Maclaurin series and the characteristic
Study/exam achievements:	Total Score = (30% x Midterm Exam Score) + (35% x Final Exam Score) + (20% x Assignment Score) + (15% x Affective Score Assessment) The initial cut - off points for grades A, A-, B+, B, B-, C+, C, C-, and D should not be less than 85, 80, 75, 70, 65, 60, 55, 50, and 40 out of 100 respectively. **Explanation:** **1. Midterm Exam** ✓ Midterm Exam is held at the 9th meeting ✓ Midterm Exam is a written exam and carried out in the classroom with an implementation time of 120 minutes according to the module schedule ✓ The Midterm Exam is carried out to see the achievements of the PLO and CLO which are in accordance with the characteristics of the advanced calculus module **2. Final Exam** ✓ Final Exam is held at the 18th meeting ✓ Final Exam is a written exam and carried out in the classroom with an implementation time of 120 minutes which follows the Final Exam implementation schedule of the department ✓ The Final Exam is carried out to see the achievements of the PLO and CLO which are in accordance with the characteristics of the advanced calculus module. **3. Assignment** ✓ Assignments are given as exercise before Midterm Exam and before Final Exam

	✓ Assignments are about analyzing problem in daily life and solve it with the concept of the content in advance calculus. ✓ Assignments are given as individual task and it is submitted in limited time. ✓ The assignment is carried out to see the achievements of the PLO and CO which are in accordance with the characteristics of advanced calculus module **4. Affective Assessment** ✓ Affective assessment is held in every meeting by observing students' attitude in classroom and daily interaction at campus such as punctuality, responsibility etc. ✓ The assessment is based on observation sheet and it is given score by affective rubric assessment.
Forms of media:	Board, LCD Projector, Laptop/Computer
Literature:	1. Stanley, J. M., (2020), *An Illustrative Guide to Multivariable and Vector Calculus*. Springer International Publishing. 2. Margareth, L., (2015). *Calculus with Application*. Pearson Education Publisher. 3. Thomas, G. (2014). *Calculus. Pearson* Education Publisher. 4. Purcell, E.J., (2013). *Calculus Early Trancendentals*, Pearson New Internatinal Edition. 5. James Steawart. (2012). *Calculus Multivariabel*. Brooks/Cole, Belmount, USA.

PLO and CO mapping

	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLO8	PLO9	PLO10	PLO11
CO1	✓										
CO2	✓										
CO3	✓										
CO4										✓	