Module/Course Description

CALCULUS (MAT 103)

A. Module Identity		
1.	Name	Calculus
2.	Code	MAT 103
3.	Credit	3 (2-3)
4.	Semester	2
5.	Coordinator	Ali Kusnanto
6.	Lecturers	Amril Aman, Bib. P. Silalahi, Budi Saharjo, Berlian Setiawaty, Donny C. Lesmana, Endar H. Nugrahani, Elis Khatizah, Fahren Bukhari, Farida Hanum, Hadi Sumarno, I Gusti Putu Purnaba, I Wayan Mangku, Jaharuddin, Tito Julito, Nur Aliatiningtyas, N.K. Kutha Ardana, Paian Sianturi, Prapto T. Supriyo, Ruhiyat, Retno Budiarti, Sugi Guritman, Sri Nurdiati, Siswandi, Toni Bakhtiar, Teduh Wulandari Mas'oed, Windiani Erliana, Hidayatul Mayyani
7.	Language	Indonesian
8.	Program(s) in which the course is offered	Internal department: - Other departments: *Common First Year Program (Education of general competency) by University*
9.	Type of teaching	a. Traditional classroom: 100 % b. Blended system: Traditional classroom…. %, Online…. % c. e-Learning system: …… % d. Others: ……….%

B. Workload of course components (total contact hours and credits per semester)								
Credit		Contact Hours				Self-Study	Other	Total
SKS *)	ECTS	Lecture	Exercise	Laboratory	Practice			
3		28	42			56		126

*) Semester credit unit according to the Indonesian higher educational system
1 credit unit lecture = 2 hours/ week for lecture and 2 hours/ week for self-study within 14 weeks/ semester
1 credit unit class exercise or laboratory or field practice = 3 hours/week within 12-14 weeks/semester
**) 1 hour for lecture= 50 minutes; 1 hour for class exercise or laboratory or field practice = 60 minutes

C. Module Objective (Learning Outcomes)
The student having the ability to explain the basic concepts in mathematics (derived function, integral function, and introduction to differential equations); to use basic mathematical techniques for solving simple math problems; to apply basic mathematical concepts and techniques for applied problems solving.

D. Detailed Course Learning Outcomes (LO) in Relation to Learning Domains, Teaching Strategies, and Assignment Methods

No.	LO in Learning Domains	Teaching Strategies	Assessment Methods
a.	**Knowledge**		
1.	Students are able **to use** the concept of derivatives, the relationship between the slope and rate of change and **to compute** the derivative of a function	Presentation of teaching materials Debriefing sessions Exercise	Midterm Exam
2.	Students are able **to compute** the maximum and minimum values of a function, monotonic interval and curvature of a function, find the asymptote of a function and **to use** it for draw graphs and solve mathematical problems related to derivatives	Presentation of teaching materials Debriefing sessions Exercise	Midterm Exam
3.	Students are able **to analyse** the relationship between broad concepts with definite integrals, the relationship between integrals and derivatives, and **to compute** the definite and indefinite integrals by the substitution method	Presentation of teaching materials Debriefing sessions Exercise	Midterm Exam, Quiz
4.	Students are able **to calculate** the derivative and	Presentation of teaching materials	Final Exam

	integral of logarithmic, exponential, and trigonometric functions	Debriefing sessions Exercise	
5.	Students are able **to solve** integrals by using partial fraction integration techniques and integration of rational functions	Presentation of teaching materials Debriefing sessions Exercise	Final Exam
6.	Students are able **to use** integrals in determining the area between curves and to use the Mean Value Theorem for integrals	Presentation of teaching materials Debriefing sessions Exercise	Final Exam, Quiz
7.	Students are able to solve first-order differential equations by separation of variables	Presentation of teaching materials Debriefing sessions Exercise	Final Exam, Quiz

E. Module Content		
List of Topic	**Number of Weeks**	**Contact Hours**
Interpretation of Derivative	1	2
Minimum and Maximum Value, The Shape of a Graph	2	4
Definite and Indefinite Integrals	2	4
Derivative and Integral of Logarithmic, Exponential, and Trigonometric Functions	3	6
Partial Fraction Integration and Integration of Rational Functions	2	4
The Mean Value Theorem	2	4
First-Order Differential Equations	2	4

F. Course Assessments			
No.	**Assessment Type *)**	**Schedule (Week Due)**	**Proportion of the Final Mark**
1.	Mid-term examination	8th week	45 %
2.	Final examination	16th week	45 %
3.	Quiz	6th and 15th week	10%

*) Example: mid-term examination, final examination, quiz, homework, project, etc.

G. Media Employed
- Classroom
- Laptop
- LCD
- Microphone (loudspeaker)
- Whiteboard

H. Learning Resources
h1. Textbooks:

1. Varberg D, Purcell EJ, Rigdon SE. 2011. *Kalkulus*. Ed ke-9. Jilid 1. Susila IN, penerjemah. Jakarta (ID): Penerbit Erlangga. Terjemahan dari: Calculus. 9th Ed.
2. Stewart J. 2002. *Kalkulus*. Ed ke-4. Jilid 1. Susila IN, Gunawan H, penerjemah. Jakarta (ID): Penerbit Erlangga. Terjemahan dari: Calculus. 4th Ed.