



DEPARTMENT OF NATIONAL EDUCATION  
YOGYAKARTA STATE UNIVERSITY  
FACULTY OF MATHEMATICS AND NATURAL SCIENCE  
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## COURSE SYLLABUS

Faculty : Mathematics and Natural Science  
Department : Natural Science Education  
Course / Code : Integral Calculus / MAT 307  
Credits : Theory: 2 SKS                      Practice: 1 SKS  
Semester : 2<sup>nd</sup>  
Prerequisite/Code : Differential Calculus / MAT 306  
Lecturer : Ariyadi Wijaya, M.Sc

### I. Course Description :

Integral calculus covers the topics of indefinite and definite integrals, the properties of integral, the fundamental theorem of integral, applications of definite integral, the transcendent function, techniques of integration, and improper integrals.

### II. Standard Competency:

Students are expected to be able to: (1) determine the indefinite integral of a function; (2) determine the definite integral using the fundamental theorem of integral; (3) determine the definite integral using techniques of integration; (4) solve integration problems; and (5) determine improper integrals

### III. Lesson strategies :

- Expository
- Discussion

IV. Lesson Plan :

Lesson	Basic Competencies	Topic	Lesson Strategies	References
1-4	Determining the indefinite integral of a function and solve differential equation	The indefinite integral and introduction of differential equation		[A]: 299–308
5-6	Calculating definite integrals using the fundamental theorem of integral	The definite integral The fundamental theorem of integral		[A]: 337–356
7-10	Determining the integral of logarithmic functions, exponential functions, and trigonometric functions.	The integral of transcendent function		[A]: 449–483 [A]: 534–539
11-13	Determining the integral of functions using substitution methods and integration by parts	Techniques of integration		[A]: 525–533 [A]: 547 - 557
14-15	Determining the integral of functions using trigonometric and partial integration	Techniques of integration		[A]: 541–546
16-17	Integrating rational functions	Techniques of integration		[A]: 558–567
18	<b>EXAM</b>			
19-20	Finding the area of flat surfaces	The area of flat surfaces		[A]: 299–308
21-22	Finding the volume of solid of revolution	The volume of solid of revolution		[A]: 337–356

	using disk methods and ring methods			
23-24	Finding the volume of solid of revolution using shell method or cylinder method.	The volume of solid of revolution.		[A]: 449–483 [A]: 534–539
25-26	Finding the length of curves	Length of curves		[A]: 525–533 [A]: 547 - 557
27-28	Finding the area of the surface of rotated curves	The surface of revolution		[A]: 541–546
29	<b>EXAM</b>			
30-32	Finding moment and center of gravity	Moment and center of gravity		[A]: 558–567

V. References :

<p>[A] Varberg Dale dan Purcell E.J. (2001). <i>Kalkulus Jilid 1 (Edisi VII)</i>, Batam: Interaksa</p> <p>[B] Leithold, L. (1986). <i>The Calculus with Analytic Geometry</i>. Harper &amp; Row Publisher.</p> <p>[C] Lang, S. (1986). <i>A First Course in Calculus (fifth edition)</i>. USA: Springer</p>
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VI. Evaluation :

Number	Components of Evaluation	Percentage (%)
1	Participation	
2	Tasks	
3	Mid Semester Exam 1	
4	Mid Semester Exam 2	
5	Final Exam	
Total		100%

Yogyakarta, .....

Head of Department .....

Lecturer,

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NIP .....

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