



Integral Calculus

Module Name	Course Module
Module Levels	Degree program
Code, if applicable	3115-205-3
Sub-titles, if applicable	-
Courses, if applicable	Integral Calculus
Semester(s) in which the module is taught	2 (Even Semester)
Person responsible for the modules	Drs. Tri Murdiyanto, M.Sc.
Lecturer(s)	Drs. Tri Murdiyanto, M.Si, Leni Dhianty S.Pd, M.Pd, Dr. Anni Sofia
language	Indonesian
Relations to Curriculum	This course is a compulsory course provided in the second semester
Type of teaching, contact hours	<p>The teaching methods used in this course are:</p> <ul style="list-style-type: none"> - Studying (synchronous:material presentations, group discussions and class discussions) - Structured assignments (Asynchronous in LMS: Discussion forums for individual assignments and questions) - Project Base Learning <p>Class capacity for lectures is 40 students. The time for lectures is one meeting of 150 minutes</p>
Workloads	<p>For this course, students are required to fulfill a minimum of 136 hours in one semester, which consists of:</p> <ul style="list-style-type: none"> - 40 hours for lectures - 48 hours for structured tasks - 48 hours for self study
Credit Points	4.5 ECTS
Requirements according to the examination regulations	Students must attend lectures at least 80%
Recommended prerequisites	Complete all individual tasks scheduled in the LMS



MINISTRY OF EDUCATION, CULTURE, RESEARCH, AND TECHNOLOGY
UNIVERSITAS NEGERI JAKARTA
FACULTY OF MATHEMATICS AND NATURAL SCIENCE

Jl. Rawamangun Muka, RT 11/RW14, Rawamangun, Pulo Gadung
 East Jakarta City, Special Capital Region Of Jakarta 13220
 Email: pend.mat@unj.ac.id, <http://fmipa.unj.ac.id/penmat>

<p>Program intended learning outcomes</p>	<p>PLO 5: Able to master the basics of mathematical theoretical concepts, including mathematical logic, discrete mathematics, algebra, analysis and geometry as well as probability theory and statistics</p> <p>PLO 6: Mastering the principles of mathematical modeling, linear programming, differential equations, and numerical methods.</p> <p><i>Course Learning Outcomes(CLO) to be achieved in this course are:</i></p> <p>CLOS 1: Understand the concept and theory of Indefinite Integral</p> <p>CLOS 2: Understand the concept and calculation of the Specific Integral</p> <p>CLOS 3: Understand integration techniques</p> <p>CLOS 4: CapableApply Integral to the field of mathematics and other fields of science</p> <p>CLOS 5: Understand the concept and calculation of the double integral</p> <p>CLOS 6: Capableapply the double integral in mathematics and other disciplines</p> <p>CLOS 7: Understand the concept and calculation of triple integral</p> <p>CLOS 8: Capableapply the triple integral in mathematics and other disciplines</p> <p>The relationship between PLO and CLO in this course is described as follows:</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse; text-align: center;"> <thead> <tr> <th rowspan="2">CLO</th> <th colspan="2">PLO</th> </tr> <tr> <th>5</th> <th>6</th> </tr> </thead> <tbody> <tr><td>1</td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td>2</td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td>3</td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td>4</td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td>5</td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td>6</td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td>7</td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> <tr><td>8</td><td style="background-color: #cccccc;"></td><td style="background-color: #cccccc;"></td></tr> </tbody> </table>	CLO	PLO		5	6	1			2			3			4			5			6			7			8		
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<p>Content</p>	<p>Students will learn about:</p> <ol style="list-style-type: none"> 25. Indefinite integral 26. Indefinite Integral Basic Formulas 27. Integral multiple functions 28. Certain integral (Riemann integral) 29. Fundamental theorem of calculus 30. Improper Integral 31. Integral with substitution (examples) 32. Integral of trigonometric forms 33. Integral by rationalizing the integral 34. Partial integral 35. The rational function integral 36. area 37. Rotational volume 38. Curve length 39. The surface area of the rotating object 40. Mass and center of mass 41. Double integral in Cartesian coordinates 42. Double integral in polar (polar) coordinates 43. Solid volume 44. Surface area 45. The mass and center of mass of the Lamina 46. Triple integral in Cartesian coordinates 47. Triple integral in cylindrical coordinates 48. Triple integral in spherical coordinates 49. Solid volume <p>The mass and center of mass of a solid body</p>
<p>Forms of Assessment</p>	<p>Components and assessment weights in learning include assignments (30%), midterm exams (35%), and final exams (35%).</p>
<p>Study and examination requirements and forms of examination</p>	<p>Study and examination requirements:</p> <ol style="list-style-type: none"> 16. Students must be present 15 minutes before class starts. 17. Students who are absent, either with notification or not, more than 20% of the total meeting are considered failed. 18. Students are not allowed to use communication tools for purposes that are not related to learning. 19. Students must submit all assignments before the allotted deadline. 20. Students must take an exam to get a final grade. <p>Form of examination: Presentation and written exam</p>



media employed	Computer/laptop, internet, LCD, whiteboard, online platform (Microsoft Teams/Zoom, LMS), Microsoft Excel, Microsoft Power Point (for materials).
reading list	Main Reference
	<ol style="list-style-type: none">6. Purcell, Varberg Rigdon, 2008, Calculus, Ninth Edition, Prentice Hall7. Strauss, 2002, Calculus, 3rd Edition, Prentice Hall8. James Stewart, 2001, Calculus 4th Edition, Erlangga9. Koko Martono, 1999, Calculus 1st edition, Erlangga10. Frank Ayres, 1998, Differential and Integral Calculus, 2nd Edition, Erlangga11. Leithold, 1991, Calculus-Analytic Measurement, 5th edition, Erlangga