



UNIVERSITAS INDONESIA
Faculty of Mathematics and Natural Sciences
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MODULE HANDBOOK

Module designation	<i>Calculus 3</i>
Semester(s) in which the module is taught	3
Person responsible for the module	<i>Dra. Siti Aminah, M.Kom.</i>
Language	<i>Indonesian</i>
Relation to curriculum	<i>Compulsory</i>
Teaching methods	<i>Lecture</i>
Workload (incl. contact hours, self-study hours)	<i>(Estimated) Total workload: 9 hours/week x 14 weeks + 5.5 hours/week x 2 weeks = 137 hours.</i> <i>Contact hours: 3 hours (150 minutes lectures).</i> <i>Private study including examination preparation, specified in hours¹:</i> <i>3 hours structured activities and 3 hours individual study per week.</i>
Credit points	3 SKS (4.77 ECTS)
Required and recommended prerequisites for joining the module	<i>Calculus 2</i>

¹ When calculating contact time, each contact hour is counted as a full hour because the organisation of the schedule, moving from room to room, and individual questions to lecturers after the class, all mean that about 60 minutes should be counted.

<p>Module objectives/intended learning outcomes</p>	<p><i>After completing the course, students have the ability</i></p> <ol style="list-style-type: none"> 1. <i>to determine the convergence or divergence of a series of real numbers using series tests.</i> 2. <i>to determine the convergence interval of a power series.</i> 3. <i>determine convergence, uniform convergence, or divergence of a series of functions using series tests.</i> 4. <i>to determine function expansion in power series</i> 5. <i>to determine the convergence or divergence of improper integrals by using improper integral tests.</i> 6. <i>to determine the Fourier series of a periodic function, even function, odd function, and function formed from half-range expansion.</i> 7. <i>to analyse the convergence of an infinite series and improper integral using the Fourier series.</i> 8. <i>to determine the Fourier integral of a function.</i> 9. <i>to analyse the convergence of an infinite series and improper integral using Fourier integral.</i>
<p>Content</p>	<ol style="list-style-type: none"> 1. <i>Infinite Series, Positive Series, Integral Test</i> 2. <i>Positive Series: Other Test</i> 3. <i>Alternative Series, Absolute Convergence, and Conditional Convergence</i> 4. <i>Power Series, Operation of Power Series, Taylor and MacLaurin Series</i> 5. <i>Infinite Sequence to a function, Infinite series to a Function, Uniform Convergence</i> 6. <i>Uniform Convergence Test, Uniform Convergence Theorem</i> 7. <i>Power Series, Operation of Power Series, Power Series Theorem</i> 8. <i>Expansion of Function in Power Series, Taylor Theorem</i> 9. <i>Introduction of Improper Integral, Improper Integral of type 1</i> 10. <i>Improper Integral of type 2, Improper Integral of type 3</i> 11. <i>Periodic Functions, Fourier Series, Orthogonality Conditions for Sine and Cosine Functions, Dirichlet Conditions</i> 12. <i>Even and odd Function, Half Range Fourier Series: Sine or Cosines</i> 13. <i>Parseval Identity, Differentiation and Integration of Fourier Series, Orthogonal Functions</i> 14. <i>Fourier Integral, Equivalent Forms of the Fourier Integral Theorem</i> 15. <i>Fourier Transformation</i>

Examination forms	<ol style="list-style-type: none"> 1. <i>Class activities : Written quiz, homework.</i> 2. <i>Mid-term examination</i> 3. <i>Final examination</i> 																				
Study and examination requirements	<p><i>The final mark will be weighted as follows:</i></p> <ol style="list-style-type: none"> 1. <i>Homework (20%).</i> 2. <i>Written Quiz (20%)</i> 3. <i>Mid-term examination (30%)</i> 4. <i>Final examination (30%)</i> <p><i>To successfully pass the module it requires minimum 55% of the total mark.</i></p> <table border="0" style="margin-left: 40px;"> <thead> <tr> <th style="text-align: left;"><i>Mark</i></th> <th style="text-align: left;"><i>Grade</i></th> </tr> </thead> <tbody> <tr><td>85—100</td><td>A</td></tr> <tr><td>80—<85</td><td>A-</td></tr> <tr><td>75—<80</td><td>B+</td></tr> <tr><td>70—<75</td><td>B</td></tr> <tr><td>65—<70</td><td>B-</td></tr> <tr><td>60—<65</td><td>C+</td></tr> <tr><td>55—<60</td><td>C</td></tr> <tr><td>40—<55</td><td>D</td></tr> <tr><td><40</td><td>E</td></tr> </tbody> </table>	<i>Mark</i>	<i>Grade</i>	85—100	A	80—<85	A-	75—<80	B+	70—<75	B	65—<70	B-	60—<65	C+	55—<60	C	40—<55	D	<40	E
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Reading list	<ol style="list-style-type: none"> 1. <i>Varberg, Dale; Edwin J. Purcell; Steven E. Rigdon. Calculus, 9th Edition, Prentice Hall Inc, 2007</i> 2. <i>Spiegel, etc. Advanced Calculus 3rd. ed., Schaum's Outlines Series, 2010.</i> 3. <i>Kreyszig. Advanced Engineering Mathematics 10thed, 2011.</i> 4. <i>Lecturer's Handout</i> 5. <i>Videos</i> 																				