



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Department of Computer Science and Electronics

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Bachelor in Computer Science

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MODULE HANDBOOK

Module name	Calculus 1
Module level, if applicable	Bachelor
Code, if applicable	MMM-1101
Courses, if applicable	Calculus 1
Semester(s) in which the module is taught	Fall (Odd)
Person responsible for the module	Chair of the Lab. Analysis, Department of Mathematics
Lecturer(s)	Prof. Dr. Supama, M.Si. Prof. Dr. Ch. Rini Indrati, M.Si. Drs. Yusuf, MA. Atok Zulijanto, S.Si., M.Si., Ph.D. Nur Khusnussaadah, S.Si., M.Sc. Prof. Dr. Widodo, MS. Dr. Salmah, M.Si. Dr. Budi Surodjo, M.Si. Dwi Ertiningsih, M.Si.
Language	Bahasa Indonesia and English
Relation to curriculum	Bachelor degree, Compulsory course in the first year (1 st semester)
Teaching methods	150 minutes of lectures and 180 minutes of structured activities per week.
Workload (incl. contact hours, self-study hours)	1. Lectures: 3 x 50 = 150 minutes (2.5 hours) per week. 2. Exercises and Assignments: 3 x 60 = 180 minutes (3 hours) per week. 3. Private study: 3 x 60 = 180 minutes (3 hours) per week.
Credit points	3 credit points
Requirements according to the examination regulations	Students have taken Calculus I course (MMM-1101) and have an examination card where the course is stated on.
Required and recommended prerequisites for joining the module	Students should be proficient in elementary algebra.

<p>Learning outcomes and their corresponding PLOs</p>	<p>After completing this course, the students should have:</p> <p>CO1. ability to understand the fundamental concepts of one variable calculus such as functions, limit, derivative, differential, and its geometry interpretation.</p> <p>CO2. ability to solve the standard problems on calculus such as properties on real numbers, functions, limit, and derivative.</p> <p>CO3. ability to apply the concepts of calculus to solve problems in mathematics and sciences especially related to optimization problems.</p> <p>CO4. ability to use limit and derivative to obtain the information about a function such as increasing or decreasing, concavity, extreme points, inflection points, including sketching its graph.</p> <p>CO5. ability to determine the Taylor series and Mac-Laurin series of a function.</p> <table border="1" data-bbox="630 724 1339 947"> <thead> <tr> <th colspan="2">PLO</th> <th>CO1</th> <th>CO2</th> <th>CO3</th> <th>CO4</th> <th>CO5</th> </tr> </thead> <tbody> <tr> <td rowspan="5">Program Learning Outcome (PLO)</td> <td>PLO1</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PLO2</td> <td>√</td> <td>√</td> <td></td> <td></td> <td>√</td> </tr> <tr> <td>PLO3</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>PLO4</td> <td></td> <td></td> <td>√</td> <td>√</td> <td></td> </tr> <tr> <td>PLO5</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	PLO		CO1	CO2	CO3	CO4	CO5	Program Learning Outcome (PLO)	PLO1						PLO2	√	√			√	PLO3						PLO4			√	√		PLO5					
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<p>Content</p>	<p>The course will cover about the system of real numbers, functions and their graph, the limit of a function, continuity, the derivative, the geometric interpretation of the derivative, higher-order derivatives, the Mean Value Theorem, L'Hospital's rule theorem of extreme value, applications of extreme problem, increasing and decreasing functions, concavity, inflection points, sketching the graph of functions, Taylor and MacLaurin series.</p>																																						
<p>Study and examination requirements and examination forms</p>	<p>In class group discussion, Quiz, Mid-terms examination and Final examination</p>																																						
<p>Media employed</p>	<p>Whiteboard, LCD Projector, Laptop/Computer</p>																																						
<p>Assessments and evaluation</p>	<p>The final mark will be weighted as follows:</p> <table data-bbox="641 1402 1372 1585"> <thead> <tr> <th>No</th> <th>Assessment methods</th> <th>Weight (percentage)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final Examination</td> <td>40%</td> </tr> <tr> <td>2</td> <td>Mid-Term Examination</td> <td>30%</td> </tr> <tr> <td>3</td> <td>Class Activities: Quiz, Homework, etc.</td> <td>30%</td> </tr> </tbody> </table> <p>The initial cut-off points for grades A, B, C, and D should not be less than 80%, 70%, 50%, and 40%, respectively.</p>	No	Assessment methods	Weight (percentage)	1	Final Examination	40%	2	Mid-Term Examination	30%	3	Class Activities: Quiz, Homework, etc.	30%																										
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Reading list	<ol style="list-style-type: none">1. Abe Mizrahi and Michael Sullivan, 1990, Calculus and Analytic Geometry, Wadsworth2. James Stewart, 1999, Calculus, 4th edition, Brooks/Cole Pub. Comp.3. Robert A. Adam and Christopher Essex, 2010, Calculus, A Complete Course, Pearson.4. Tim Pengajar Kalkulus, 2003, Diktat Kuliah Kalkulus I, FMIPA UGM.
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