



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

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Doctoral Program in Mathematics

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MODULE HANDBOOK Doctoral in Mathematics

Module name:	Differential Geometry															
Module level, if applicable:	Doctoral Program															
Code, if applicable:	MMM6109															
Semester(s) in which the module is taught:	II (second year)															
Person responsible for the module:	Dr. Fajar Adi Kusumo, M.Si.															
Lecturer(s):	Dr. Fajar Adi Kusumo, M.Si.															
Language:	Bahasa Indonesia															
Relation to curriculum:	Doctoral Degree in Mathematics, Elective, 1 st or 2 nd semester															
Credit points:	3															
Type of teaching, contact hours:	3x50 minutes lectures, 3x50 minutes structured activities.															
Workload:	<ul style="list-style-type: none"> • 3x50 minutes lectures, • 3x50 minutes structured activities, • 3x50 minutes individual study, • In 16 weeks per semester (including mid-term and final examinations). • Total: 144x50 minutes per semester. 															
Requirements according to the examination regulations:	NONE															
Recommended prerequisites:	Before taking this course, the students must have a good understanding about the concept of the Differential Equations and Multivariable Calculus.															
Module objectives/intended learning outcomes:	<p>After completing this course the students should have:</p> <ul style="list-style-type: none"> • CO 1. Ability to analyze the cases those are using differential equations in geometrical point of view. • CO 2. Ability to classify the equations of motion using Frenè Formula and Frame Field • CO 3. Ability to compute the curvature and covariant derivative for the equations of motion. • CO 4. Ability to use the Geometry Differential to support the research 															
Content:	<p>Topics :</p> <ol style="list-style-type: none"> a. Euclidean Space and Tanget Vector b. Directional derivative on tangent vector c. Differential Form d. Frènet Formula, e. Covariant Derivative f. Frame Field and Connection Form. g. Advaned concept in Differential Geometry 															
Study and examination requirements and forms of examination:	<p>The final mark will be weighted as follows:</p> <table border="1"> <thead> <tr> <th>No</th> <th>Assessment methods (components, activities)</th> <th>Weight (percentage)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Final Examination</td> <td>35%</td> </tr> <tr> <td>2</td> <td>Mid-Term Examination</td> <td>30%</td> </tr> <tr> <td>3</td> <td>Projects</td> <td>25%</td> </tr> <tr> <td>4</td> <td>Peer Assessment/Quiz</td> <td>10%</td> </tr> </tbody> </table> <p>Final grade will be determined as follows:</p>	No	Assessment methods (components, activities)	Weight (percentage)	1	Final Examination	35%	2	Mid-Term Examination	30%	3	Projects	25%	4	Peer Assessment/Quiz	10%
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1	Final Examination	35%														
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	<p>Grade Criteria</p> <p>A $95 \leq \text{final mark} \leq 100$</p> <p>A- $90 \leq \text{final mark} < 95$</p> <p>A/B $85 \leq \text{final mark} < 90$</p> <p>B+ $78 \leq \text{final mark} < 85$</p> <p>B $70 \leq \text{final mark} < 78$</p> <p>B- $65 \leq \text{final mark} < 70$</p> <p>B/C $60 \leq \text{final mark} < 65$</p> <p>C+ $54 \leq \text{final mark} < 60$</p> <p>C $48 \leq \text{final mark} < 54$</p> <p>C- $40 \leq \text{final mark} < 48$</p> <p>C/D $35 \leq \text{final mark} < 40$</p> <p>D+ $30 \leq \text{final mark} < 35$</p> <p>D $25 \leq \text{final mark} < 30$</p> <p>E < 25</p>
Media employed:	White/Black Board, LCD Projector, Laptop/Computer
Reading List:	<ol style="list-style-type: none"> O'Neill, B., Elementary Differential Geometry, Elsevier, 2006 Thorpe, J.A., Elementary Topics in Differential Geometry, Springer-Verlag New York, Inc, 1979

Mapping of The COs and PLOs

	PLO – 1 S2 Mat	PLO – 2 S2 Mat	PLO – 3 S2 Mat	PLO – 4 S2 Mat	PLO – 5 S2 Mat	PLO – 6 S2 Mat
CO 1	√	√	√			
CO 2		√	√			
CO 3		√	√		√	
CO 4		√	√		√	