



UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

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Master in Mathematics

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MODULE HANDBOOK

Master in Mathematics

Module name:	Optimization by Vector Space Methods (<i>Optimisasi dengan Metode Ruang Vektor</i>)												
Module level, if applicable:	Master Programme												
Code, if applicable:	MMM 6301												
Subtitle, if applicable													
Courses, if applicable													
Semester(s) in which the module is taught:	III (second year)												
Person responsible for the module:	Chair of the Applied Mathematics Research Group												
Lecturer(s):	Lina Aryati												
Language:	Bahasa Indonesia												
Relation to curriculum:	Master Degree in Mathematics, Elective, 3 st semester												
Teaching methods													
Workload (incl. contact hours, self-study hours)	<ul style="list-style-type: none"> • 3x50 minutes lectures, • 3x60 minutes structured activities, • 3x60 minutes individual study, • In 16 weeks per semester (including mid-term and final examinations). • The total workload is 136 hours per semester. 												
Credit points	3												
Required and recommended prerequisites for joining the module:	Before taking this course, it is better if students have understood very well about finite difference methods.												
Module objectives/intended learning outcomes:	<p>After taking this course, students are expected to be able to</p> <ul style="list-style-type: none"> • CO 1. solve some real problems related to minimum norm problems in Hilbert Spaces. • CO 2. solve some real problems related to minimum norm problems in Banach Spaces. • CO 3. solve some real problems related to optimization problems of functional. 												
Content:	Introduction. Minimum Norm Problem in Hilbert Spaces: Projection Theorem, Primal and Dual Problem, Modified Projection Theorem, Application. Minimum Norm Problem in Banach Spaces: Hanh Banach Theorem, Extension of Hanh Banach Theorem. Application. Optimization of Functional, Problem with constraints, Lagrange Multiplier, Application.												
Examinations forms	Essay.												
Study and examination requirements	<p>To pass the course, the minimum grade is C. 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>35%</td> </tr> <tr> <td>3</td> <td>Class Activities: Quiz, Homework, etc.</td> <td>30 % (10 % case-based)</td> </tr> </tbody> </table>	No	Assessment methods (components, activities)	Weight (percentage)	1	Final Examination	35%	2	Mid-Term Examination	35%	3	Class Activities: Quiz, Homework, etc.	30 % (10 % case-based)
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1	Final Examination	35%											
2	Mid-Term Examination	35%											
3	Class Activities: Quiz, Homework, etc.	30 % (10 % case-based)											
Media employed:	Board, LCD Projector, Laptop/Computer												

Reading List:	Luenberger D. G., 1997, <i>Optimization by Vector Space Methods 1st</i> , John Wiley & Sons, Inc., New York.
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CO-PLO Mapping

	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			V	V	V	V
CO 2			V	V	V	V
CO 3			V	V	V	V

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