



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:	Advanced Financial Mathematics								
Module level, if applicable:	Doctoral Program								
Code, if applicable:	MSM 899								
Semester(s) in which the module is taught:	1								
Person responsible for the module:	Chair of Statistics Research Group								
Lecturer(s):	Dr. Abdurakhman								
Language:	Bahasa Indonesia								
Relation to curriculum:	Doctoral Degree in Mathematics, Compulsory / Elective Course								
Credit points:	3 Semester Credit Unit								
Type of teaching, contact hours:	3x50 minutes lectures, 3x60 minutes structured activities.								
Workload:	<ul style="list-style-type: none"> • 3x50 minutes lectures, • 3x60 minutes structured activities, • 3x60 minutes individual study, • In 16 weeks per semester (including assignments and examinations) 								
Recommended prerequisites:	-								
Module objectives/intended learning outcomes:	<p>On successful completion of this course, students should be able to:</p> <p>CO 1: Students are able to apply present value and annuities formulae</p> <p>CO 2: Students are able to evaluate the latest approach in financial mathematics</p> <p>CO 3: Student are able to apply the concept of basic financial mathematics in modelling</p>								
Content:	<p>This course is a course that discusses the application of mathematics in finance. Topics include interest material, interest rates, simple interest, compound interest, continuous interest, accumulated value, present value, discount rate. This course also studies the series of payments or annuities, basic annuities, advanced annuities, perpetuities, amortization, sinking funds. In addition, this course also studies the determination of bond prices, yields, reinvestment of interest rates, net present value, latest topics in mathematical finance</p>								
Study and examination requirements and forms of examination:	<p>The final mark will be weighted as follows:</p> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: left;">No (components, activities)</th> <th style="text-align: right;">Weight (percentage)</th> </tr> </thead> <tbody> <tr> <td>1 Homework</td> <td style="text-align: right;">20</td> </tr> <tr> <td>2 Paper assignment</td> <td style="text-align: right;">50</td> </tr> <tr> <td>3 Discussion</td> <td style="text-align: right;">30</td> </tr> </tbody> </table> <p>Final grade will be determined as follows: Grade Criteria The initial cut-off points for grades A, B, C, and D should not be less than 80%, 65%, 50%, and 40%, respectively. Grade scale:</p>	No (components, activities)	Weight (percentage)	1 Homework	20	2 Paper assignment	50	3 Discussion	30
No (components, activities)	Weight (percentage)								
1 Homework	20								
2 Paper assignment	50								
3 Discussion	30								

	A	80≤score	C	40≤score<50
	A/B	70≤score<80	D	20≤score<40
	B	60≤score<70	E	score<20
	B/C	50≤score<60		
Media employed:	Slides, White Boards			
Reading List:	1. Kellison, S. G., 1991. <i>The Theory of Interest</i> , John Wiley & Sons. New York. 2. Yuh-Dauh Lyuu, 2004. <i>Financial Engineering and Computation</i> . Cambridge University Press, United Kingdom.			

Mapping of The COs and PLOs

	PLO - 1 S3 Mat	PLO - 2 S3 Mat	PLO - 3 S3 Mat	PLO - 4 S3 Mat	PLO - 5 S3 Mat	PLO -6 S3 Mat
CO 1			X			
CO 2		X				
CO 3				X		

Programme Learning Outcomes (PLO) Doctoral Programme in Mathematics

PLO-1	:	Attitude: Devote to God Almighty, uphold the humanity values, internalize academic values and ethics, responsible in working in the area of expertise independently.
PLO-2	:	Knowledge: Mastering philosophy of mathematics and one of the fields in mathematics (algebra, analysis, applied mathematics, statistics, computational mathematics, computational statistics).
PLO-3	:	Knowledge: Able to think logically, analytically, inductively, deductively, and structured; having the ability to manage, lead, and develop research programs independently, and able to communicate the thoughts as well as his work to the scientific community and the general public.
PLO-4	:	Skill: Creating new concepts and / or new methods (original) in the field of mathematics that are recognized nationally and internationally.
PLO-5	:	Skill: Able to apply mathematics according to their field of expertise to solve problems including those that require a multidisciplinary, cross-disciplinary, or trans-disciplinary approach.
PLO-6	:	Life Long Learning: Having lifelong learning skills and adaptive to the development of science and technology, especially in fields related to Mathematics and its applications.