UNIVERSITAS GADJAH MADA
Faculty of Mathematics and Natural Sciences
Mathematics Department
Sekip Utara Bulaksumur Yogyakarta 55281 Telp: +62 274 552243 Fax: +62 274 555131 Email: math@ugm.ac.id Website: matematika.fmipa.ugm.ac.id

Graduate Program in Mathematics

Telp : +62 274 552243
Email : maths3@ugm.ac.id;
Website : http://s3math.fmipa.ugm.ac.id

MODULE HANDBOOK
Doctoral in Mathematics

Module name:	Risk Theory and Modeling (Pemodelan dan Teori Risiko)
Module level, if applicable:	Doctor Program
Code, if applicable:	MMM-5446
Semester(s) in which the module is taught:	First Year
Person responsible for the module:	Chair of The Study Program
Lecturer(s):	1. Dr. Gunardi, 2. Dr. Adhitya Ronnie Effendie
Language:	Bahasa Indonesia
Relation to curriculum:	Doctor Degree in Mathematics, Compulsary Courses
Credit points:	3
Type of teaching, contact hours:	3x50 minutes lectures, 3x50 minutes structured activities.
Workload:	• 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 in financial mathematics
Module objectives/intended learning outcomes:	On satisfying the requirements of this course, students will have the knowledge and skills to: CO-1: Students will comprehend risk modelling and will be able to: • Explain the concepts of measure of risk • Calculate risk • Define risk modelling CO-2: Students will understand main concepts associated with risk theory and risk modelling, as well as their applications • Explain the concepts of actuarial modelling • Calculate actuarial risk • Define Actuarial risk modelling CO-3: Students will understand key concepts aggregate loss models and their applications. • Explain the concepts of aggregate loss • Calculate aggregate loss • Define aggregate loss models
Content:	The purpose of this course is to develop knowledge of the fundamental modelling tools for quantitatively assessing actuarial risk. The application of these tools to problems encountered in actuarial science is emphasized. A thorough command of the supporting calculus and financial mathematics are assumed. • Basic distributional quantities • Risk measurements • Characteristics of actuarial models

	• Continuous and discrete models • Frequency and severity with coverage modifications • Aggregate loss models
Study and examination requirements and forms of examination:	The final mark will be weighted as follows: No Assessment methods (components, activities) Weight (percentage) 1 Formulation the originality of research problem 25% 2 Formulation the theoritical framework 25% 3 Formulation the conjecture and metodhology 20% 4 Presentation 30% Final grade will be determined as follows: Grade Criteria A : $95 \leq$ final mark ≤ 100 A- : $90 \leq$ final mark < 95 A/B : $85 \leq$ final mark < 90 B+ : $78 \leq$ final mark < 85 B : $70 \leq$ final mark < 78 B- : $65 \leq$ final mark < 70 B/C : $60 \leq$ final mark < 65 C+ : $54 \leq$ final mark < 60 C : $48 \leq$ final mark < 54 C- : $40 \leq$ final mark < 48 C/D : $35 \leq$ final mark < 40 D+ : $30 \leq$ final mark < 35 D : $25 \leq$ final mark < 30 E : final mark < 25
Media employed:	White/Black Board, LCD Projector, Laptop/Computer
Reading List:	The related references to the dissertation will be nominated as per the selected topic and content. General references: 1. Klugman S.A., Panjer H.H., Wilmot G.E., (2012) *Loss Models: From Data to Decisions*, 4th edition, Wiley.

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	√	√	√		√	√

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.