



# UNIVERSITAS GADJAH MADA

Faculty of Mathematics and Natural Sciences

Mathematics Department

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## Graduate Program in Mathematics

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### MODULE HANDBOOK

<b>Module name:</b>	Health Insurance															
<b>Module level, if applicable:</b>	Master Program															
<b>Code, if applicable:</b>	MMM-5508															
<b>Semester(s) in which the module is taught:</b>	First Year															
<b>Person responsible for the module:</b>	Chair of The Study Program															
<b>Lecturer(s):</b>	Dr. Adhitya Ronnie Effendie, M.Sc															
<b>Language:</b>	Bahasa Indonesia															
<b>Relation to curriculum:</b>	Master Degree in Mathematics															
<b>Credit points:</b>	3															
<b>Type of teaching, contact hours:</b>	3x50 minutes lectures, 3x50 minutes structured activities.															
<b>Workload:</b>	Total workload is 136 hours per semester, which consists of 150 minutes lectures per week for 14 weeks, 180 minutes structured activities per week, 180 minutes individual study per week, in total is 16 weeks per semester, including mid exam and final exam															
<b>Requirements according to the examination regulations:</b>	NONE															
<b>Recommended prerequisites:</b>	Before taking this course, the students must have a good understanding in Actuarial mathematics															
<b>Module objectives/intended learning outcomes:</b>	On satisfying the requirements of this course, students will have the knowledge and skills to: CO-1: Explain the types of health insurance products with their actuarial models CO-2: Explain and use the claim frequency model, claim severity and collective risk models in health insurance. CO-3: Explain and use mortality, morbidity and multi-status models in health insurance. CO-4: Explain actuarial models that can be used in the collective risk insurance system and the national health insurance system. CO-5: Develop a health insurance product with its actuarial model based on real and simulated data															
<b>Content:</b>	Health Insurance Products; Model claim frequency and claim severity; Mortality, Morbidity and Multi-status Models; Collective Risk Model; Actuarial models related to National Health Insurance															
<b>Study and examination requirements and forms of examination:</b>	The final mark will be weighted as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>No</th> <th>Assessment methods (components, activities)</th> <th>Weight (percentage)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Formulation the originality of research problem</td> <td>25%</td> </tr> <tr> <td>2</td> <td>Formulation the theoritical framework</td> <td>25%</td> </tr> <tr> <td>3</td> <td>Formulation the conjecture and metodhology</td> <td>20%</td> </tr> <tr> <td>4</td> <td>Presentation</td> <td>30%</td> </tr> </tbody> </table>	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%
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4	Presentation	30%														

	<p>Final grade will be determined as follows:</p> <p>Grade Criteria</p> <p>A : <math>95 \leq \text{final mark} \leq 100</math></p> <p>A- : <math>90 \leq \text{final mark} &lt; 95</math></p> <p>A/B : <math>85 \leq \text{final mark} &lt; 90</math></p> <p>B+ : <math>78 \leq \text{final mark} &lt; 85</math></p> <p>B : <math>70 \leq \text{final mark} &lt; 78</math></p> <p>B- : <math>65 \leq \text{final mark} &lt; 70</math></p> <p>B/C : <math>60 \leq \text{final mark} &lt; 65</math></p> <p>C+ : <math>54 \leq \text{final mark} &lt; 60</math></p> <p>C : <math>48 \leq \text{final mark} &lt; 54</math></p> <p>C- : <math>40 \leq \text{final mark} &lt; 48</math></p> <p>C/D : <math>35 \leq \text{final mark} &lt; 40</math></p> <p>D+ : <math>30 \leq \text{final mark} &lt; 35</math></p> <p>D : <math>25 \leq \text{final mark} &lt; 30</math></p> <p>E : final mark &lt; 25</p>
<b>Media employed:</b>	White/Black Board, LCD Projector, Laptop/Computer
<b>Reading List:</b>	<p>The related references to the dissertation will be nominated as per the selected topic and content.</p> <p>General references:</p> <ol style="list-style-type: none"> <li>1. Cichon, M, Newbrander, W, Yamabana, H., Weber, A., Normand, C., Dror, D. and Preker, A., 1999, <i>Modelling in Health Care Finance</i>, International Labour Organization, Geneva</li> <li>2. Cunningham, R. J., Herzog, T. N and London, R. L. , 2006, <i>Models for Quantifying Risk</i>, 2<sup>nd</sup> ed., ACTEX Publications, Inc.</li> <li>3. Pitacco, E., 2014, <i>Health Insurance. Basic Actuarial Models</i>, Springer.</li> </ol>

### 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

<b>PLO-1</b>	<b>:</b>	<p><b>Attitude:</b></p> <p>Devote to God Almighty, uphold the humanity values, internalize academic values and ethics, responsible in working in the area of expertise independently.</p>
<b>PLO-2</b>	<b>:</b>	<p><b>Knowledge:</b></p> <p>Mastering philosophy of mathematics and one of the fields in mathematics (algebra, analysis, applied mathematics, statistics, computational mathematics, computational statistics).</p>
<b>PLO-3</b>	<b>:</b>	<p><b>Knowledge:</b></p> <p>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.</p>
<b>PLO-4</b>	<b>:</b>	<p><b>Skill:</b></p>

		Creating new concepts and / or new methods (original) in the field of mathematics that are recognized nationally and internationally.
<b>PLO-5</b>	:	<b>Skill:</b> 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.
<b>PLO-6</b>	:	<b><i>Life Long Learning:</i></b> Having lifelong learning skills and adaptive to the development of science and technology, especially in fields related to Mathematics and its applications.

**Compilation Date** : 8/9/2022

**Modified Date** : 9/4/2023