

## IV.16.4 Actuarial mathematics 2

module designation	<b>Insurance Mathematics 2</b>
abbreviation	<b>B-VE2</b>
course	<i>actuarial science</i>
Module manager	<i>Prof. Dr. Michael Fröhlich</i>
lecturer	<i>Prof. Dr. Michael Fröhlich, Dr. Doris Augustine</i>
Assignment to the Curriculum B.Sc. :	<i>Conscription, 6. o. 7. Sem.</i>
Lehrform / SWS	<i>Seminar-based instruction, exercises / 4 SWS</i>
workload in hours	<i>Attendance study: 60 h, Self-study: 90 h</i>
credit points	<b>5 ECTS</b>
recommended requirements	<i>B-AN1,2: Analysis 1,2; B-LA1,2: Lineare Algebra 1,2; B-WS1,2: probability theory and 1, 2; B-VE1: Actuarial mathematics 1</i>
Learning goals: Professional competence	<p><i>After successfully completing the module, the students are able to</i></p> <ul style="list-style-type: none"> <li><i>• with the basic terms and methods of sick and familiar with pension actuarial mathematics (2),</i></li> <li><i>• to know (1) and to be able to apply (3) the elimination regulations in pension actuarial mathematics,</i></li> <li><i>• calculate the settlement amount and present value of pension obligations (3),</i></li> <li><i>• calculate the actuarial pension reserve (3),</i></li> <li><i>• understand the context and content of pension commitments (1) and calculate the partial value (3),</i></li> <li><i>• to know tariff types in private health insurance (PKV) (1),</i></li> <li><i>• Understand head damage statistics in PKV and apply (3),</i></li> <li><i>• Carry out premium calculation for new business in private health insurance (3),</i></li> <li><i>• to determine the aging reserves of private health insurance portfolios (2),</i></li> <li><i>• The calculation of the private health insurance premium for existing customers to change tariffs (3),</i></li> <li><i>• to know the problem of old people in private health insurance (1).</i></li> </ul>
Learning goals: personal competence	<i>See preliminary remarks of this module handbook</i>

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contents	<ul style="list-style-type: none"> <li>• <i>Environment and content of pension commitments</i></li> <li>• <i>Elimination rules</i></li> <li>• <i>Settlement amount and present value of pension obligations</i></li> <li>• <i>Premiums in pension insurance</i></li> <li>• <i>Actuarial reserve</i></li> <li>• <i>Practical issues</i></li> <li>• <i>Economic and legal environment of private health insurance</i></li> <li>• <i>Tariffs</i></li> <li>• <i>Head damage stats</i></li> <li>• <i>Premium calculation for new business</i></li> <li>• <i>Inventory aging reserve</i></li> <li>• <i>Tariff change</i></li> <li>• <i>Surplus sharing for contribution reduction in old age</i></li> <li>• <i>Actuarial control cycle for inventory contribution</i></li> <li>• <i>Actuarial models to quantify the risk</i></li> </ul>
Study/examination achievements	<p>Written examination (90-120 min.) or oral exam (15-45 min.)  Note weight: 4</p>
media forms	<p>board, projector,</p>
literature	<ul style="list-style-type: none"> <li>• <i>Bohn, K.:</i> <i>The mathematics of German private health insurance, Karlsruhe 1980</i></li> <li>• <i>Heubeck, K.: Richttafeln 2005 G, Köln 2005</i></li> <li>• <i>Neuburger, E.: Pension insurance mathematics, in: Neuburger, E. (ed.): Mathematics and technology of company pension commitments, Karlsruhe 1997</i></li> <li>• <i>Neuburger, E.:</i> <i>Formulas of pension insurance mathematics,</i> <a href="http://www.neuburger.com/formeln/formeln.html">www.neuburger.com/formeln/formeln.html</a></li> <li>Thullen, P.: <i>Mathematical methods of social security, VVW</i></li> <li>• <i>Wolfsdorf, K.: Insurance mathematics part 1, 2nd edition, Stuttgart 1997</i></li> <li>• <i>Wolfsdorf, K.: Insurance mathematics part 2, Stuttgart 1988</i></li> </ul>