

## M.Sc. in Economics

<b>Code:</b>	017 919	<b>Type:</b>	M. Sc. in Economics 2010 – 2012, 5 <sup>th</sup> term
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<b>Title:</b>	Economy of Risk in Insurance
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<b>Lecturer:</b>	Michel Dacorogna
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<b>ECTS:</b>	3	<b>Contact hours (per semester):</b>	20
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<b>Semester:</b>	Winter 2012	<b>Frequency of the lecture:</b>	5 times a week
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<b>Dates:</b>	Feb 20 – 24, 2012 and April 16 – 20, 2012
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<b>Prerequisites:</b>	Basic of financial mathematics and statistics
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### Learning objectives (What are the intended learning outcomes? Which skills will be acquired?):

The purpose of the course is to familiarize the student with the modern concepts of insurance in view of their application to pricing, capital management and solvency regulation. Most of those concepts are in line with the financial theory and apply to both P&C and life insurance.

### Content (Which professional competence and which contents will be imparted?):

The course is thought in eight modules, which provide a different view on the problem of understanding, modeling and managing risk. The last module bringing together in a coherent framework all the concepts introduced in the other module in a coherent framework:

1. In a first part, we present the concept of risk and risk measure and the pricing of risk in insurance.
2. Aggregation of risk and dependencies
3. Concept and management of capital
4. Developing and testing an internal model
5. Modeling the risk of the world economy (Developing an Economic Scenario Generator)
6. Solvency regulation and reinsurance
7. Adding time diversification to risk diversification
8. Enterprise risk management towards a holistic approach to risk management

### Teaching approach (Description of the learning and teaching methods):

Course with the help of slides and discussions and questions of the students. The slides illustrate the course with real life examples of managing and pricing the risks.

### Workload (Definition of workload (ECTS), divided in pre-modules (e.g. pre-readings), core-modules (contact hours), post-modules (e.g. case studies)):

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### Language of instruction (Information on the language of teaching):

English

### Obligatory literature (E.g. scripts, books, articles, cases, papers):

- Dynamic Financial Analysis, 2004, in the Encyclopaedia of Actuarial Science, vol.1 pages 505-519, edited by J. Teugels and B. Sundt published by John Wiley & Sons, with Peter Blum.
- Managing Bank Capital by Chris Matten, John Wiley, 2000 (Part one: the role and definition of capital)
- An Illustrative Example of Pricing Risk by Michel Dacorogna and Christoph Hummel, TECHNICAL NEWSLETTER SCOR GLOBAL P&C, 2008 (Available on demand at <http://www.scor.com/en/sgrc/scor-publications/pac-publications.html>)
- Capital at Risk Michel Dacorogna and Christoph Hummel, Global Reinsurance, 1st of July 2005
- How much capital does a reinsurance need?, by Jean-Luc Besson, Michel Dacorogna, Paolo de Martin, Michael Kastenholz and Michael Moller, The Geneva Papers, vol. 34, pages 159-174, 2009

### Additional literature (E.g. books, articles, cases, papers):

- Risk Management by Michel Crouhy, Dan Galai and Robert Mark Mc Graw Hill, 2001
- Modelling Extremal Events for Insurance and Finance by Paul Embrechts, Claudia Klüppelberg and Thomas Mikosch, Springer, 1997
- Practical Risk Theory for Actuaries by C.D: Daykin, T. Pentikäinen and M. Pesonen published by Chapman & Hall, second edition 1996
- Using the past to predict economic risks by Michel Dacorogna, Ulrich Müller and Roland Bürgi, TECHNICAL NEWSLETTER SCOR GLOBAL P&C, 2008 (Available on demand at <http://www.scor.com/en/sgrc/scor-publications/pac-publications.html>)
- Risk Aggregation, dependence structure and diversification benefit, 2008, by Roland Bürgi, Michel Dacorogna and Roger Iles, chap. 12, pages 265-306, in "Stress testing for financial institutions", edited by Daniel Rösch and Harald Scheule, Riskbooks, Incisive Media, London.
- From Principle Based Risk Management to Solvency Requirements, an analytical framework for the Swiss Solvency Test, SCOR book, 2008 (available on demand at: <http://www.scor.com/en/sgrc/scor-publications/scor-papers.html>)
- Integrating Corporate Risk Management, by Prakash A. Shimpi, David Durbin, David S. Laster, Carolyn P. Helbling and Daniel Helbling, Swiss Re Book, 1999
- Reinsurance, Principles and State of the Art, 2nd Edition, contribution book edited by Andreas Schwepcke, Verlag Versicherungswirtschaft, Karlsruhe, 2004
- Quantitative Risk Management: Concepts, Techniques, Tools, by Paul Embrechts, Rudiger Frey and Alexander J. McNeil, Princeton University Press, Princeton, 2005
- Actuarial Theory for Dependent Risks: Measures, Orders and Models, by Michel Denuit, Jan Dhaene, Marc Goovaerts and Rob Kaas, John Wiley & Sons, Chichester, 2005
- The influence of risk measures and tail dependencies on capital allocation, by Davide Canestraro and Michel Dacorogna, SCOR paper 7, January 2010.
- Adapting the solvency regulation to times of crisis, accepting the riskiness of the situation, by Jean-Luc Besson, Michel Dacorogna, Philippe Trainar, SCOR paper 6, January 2010.
- Principle-based solvency: A comparison between Solvency II and the Swiss Solvency Test, by Michel Dacorogna and Philipp Keller, SCOR paper 8, March 2010.

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- PrObEx a new method for calibration of copula parameters from prior information, observations and expert opinions, by Philipp Arbenz and Davide Canestraro, SCOR paper 10, December 2010.
- Preparing for Solvency II, points of debate in the Standard Formula, by Michel Dacorogna, Ecaterina Nisipasu and Mathieu Poulin, SCOR paper 13, March 2011.

**Mode of examination** (Mode of the examinations and tests (e.g. oral or written examination, lecture, homework, papers, class participation):

**Grading:**

**Special features** (E.g. excursion, guest speaker):

**Contact information:**

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**Office hours:**

**Course website:**