

**IUSS**

Scuola Universitaria Superiore Pavia

UME School, a.y. 2016-2017

**Course: Near real-time Natural Disaster Loss Estimation**

Lecturers: Prof. Mario Ordaz, Dr. Mario Martina

Date: 02 May – 15 May, 2017

Classroom: 1-16, 1-17@IUSS

**Course schedule**

Week	Date	Lecture hours	Subject	Tot h
1	02/05/2017	14:30 - 17:30	1. Introduction: scope and background. (M. Martina)	3
	03/05/2017	14.30 - 17:30	2. Basics of risk evaluation (M. Ordaz)	3
	05/05/2017	15:00 - 18:00	3. Basics of disaster insurance and financing (M. Ordaz)	3
2	08/05/2107	10:00 – 13:00 14:30 - 17:30	4. Overview on parametric model structure (M. Martina) 5. Basics of EQ Risk Modelling (M. Ordaz)	6
	09/05/2017	10:00 - 13:00 14.30 - 17:30	6. Near-real Time models for EQ (M. Ordaz) 7. Trigger-based models (M. Martina)	6
	10/05/2017	10:00 - 13:00	8. Project definition and development (M. Ordaz)	3
	11/05/2017	10:00 - 13:00	9. Near-Real Time models for Flood and project development (M. Martina)	3
3	15/05/2017	09:30 – 12:30	10. Project discussion and presentations (M. Ordaz and M. Martina)	3



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## Course Description

The aim of the course is to an overview of the near real-time models for the loss estimation of natural disasters. The course will be organized into 15 hours of lectures on theory, 6 hours of practical applications and 9 hours of tutorial.

1. Introduction to near real-time loss estimation models
  - 1.1. Basic concepts
  - 1.2. Scope
  - 1.3. Background
2. Overview on the structure of the model
  - 2.1. The requirements for input data
  - 2.2. The hazard module
  - 2.3. The vulnerability module
  - 2.4. The exposure module
  - 2.5. Post-disaster impact analysis
3. Basic definitions and concepts of insurance
  - 3.1. The risk financing and transfer
  - 3.2. Limits and deductibles
  - 3.3. The pure premium
  - 3.4. The criteria for the quotation
4. Disaster financing mechanisms
  - 4.1. Sovereign Disaster Risk Finance
  - 4.2. Cat bonds
  - 4.3. Parametric insurance programs
  - 4.4. The basis risk
5. Trigger based models
  - 5.1. Design criteria
  - 5.2. Consequence database
  - 5.3. Skill assessment
6. Examples of near real-time loss estimation for earthquake
7. Examples of near real-time loss estimation for flood
8. Project definition, development and presentation

### Useful references



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Disaster Risk Finance as a Tool for Development : A Summary of Findings from the Disaster Risk Finance Impact Analytics Project, World Bank Group (2016)

<https://openknowledge.worldbank.org/bitstream/handle/10986/24374/DisasterRisk00ct0Analytics0Project.pdf?sequence=1&isAllowed=y>

Financial Protection Against Natural Disasters : An Operational Framework for Disaster Risk Financing and Insurance, World Bank Group (2014)

<https://openknowledge.worldbank.org/bitstream/handle/10986/21725/949880WP0Box380st0Natural0Disasters.pdf?sequence=1&isAllowed=y>

Evaluating Sovereign Disaster Risk Finance Strategies : A Framework

Clarke, Daniel; Mahul, Olivier; Poulter, Richard; Teh, Tse Ling (2016-06)

<https://openknowledge.worldbank.org/bitstream/handle/10986/24637/Evaluating0sov0tegies000a0framework.pdf?sequence=1&isAllowed=y>

Disaster Risk Assessment and Risk Financing, A G20 / OECD METHODOLOGICAL FRAMEWORK

<https://www.oecd.org/gov/risk/G20disasterriskmanagement.pdf>

Benjamin, J. R. and C. A. Cornell (1970). Probability, Statistics, and Decision for Civil Engineers. New York, McGraw-Hill.

Forecast Verification methods Across Time and Space Scales , WWRP/WGNE Joint Working Group on Forecast Verification Research, <http://www.cawcr.gov.au/projects/verification/>

Jolliffe, I.T., and D.B. Stephenson, 2012: Forecast Verification: A Practitioner's Guide in Atmospheric Science. 2nd Edition. Wiley and Sons Ltd, 274 pp.