



UNIVERSITÀ DEGLI STUDI  
DI PERUGIA



# CIVIL AND ENVIRONMENTAL ENGINEERING

## DOCTORAL PROGRAM

## PROBABILITY THEORY, STOCHASTIC PROCESSES AND RELIABILITY

### MODULE 2 MODELING AND SIMULATION OF STOCHASTIC PROCESSES

**Instructor:** Massimiliano Gioffrè, Ph.D., Associate Professor,  
Perugia University

**Course Description:** This module is aimed to provide the fundamentals of modeling and simulation of stochastic processes and fields. The module is organized in three four-hours Sections where practical work and lessons in theory are alternated. It covers both introductory and advanced topics in random functions, including stationary and non-stationary models, Gaussian and non-Gaussian models, Monte Carlo simulation. Classroom practical work using programming software is proposed to deepen inside the proposed theory.

**January, 15th 2020**

**Section 1: Fundamentals on Random Functions**  
09:30-11:30 Stochastic processes and fields  
14:30-16:30 Stationary and non-Stationary models

**January, 22nd 2020**

**Section 2: Gaussian and non-Gaussian Models**  
09:30-11:30 Gaussian processes

**January, 23rd 2020**

09:30-11:30 Translation processes  
**Section 3: Monte Carlo Simulation**  
14:30-16:30 Correlation-based simulation

**January, 30th 2020**

09:30-11:30 Spectral density-based simulation



Massimiliano Gioffrè is Associate Professor in Structural Mechanics at Perugia University, Department of Civil and Environmental Engineering. He is chair of the Master degrees in Civil Engineering and Building-Architecture Engineering at Perugia University. He is vice-Director at CRIACIV (Italian Inter-university Research Center in Construction Aerodynamics and Wind Engineering. He received his Ph.D. in Structural Engineering from Firenze University. He was a one-year visiting researcher at Cornell University in 1998 and cooperated with NIST.

Massimiliano was Associate Professor at Syracuse University, School of Architecture, in 1999, teaching the classes Introduction to Structures and Advanced Structures. He is currently leading research projects funded by the European Community (PSR) and local Institutions (Umbria Region, FCRPG). His research yielded chapters in books and more than 140 papers in the field of Stochastic Mechanics, Wind Engineering, Structural Identification, Structural Optimization and Structural Health Monitoring.

**Location:** Campus of Engineering of University of Perugia  
Latitude: 43.118177 Longitude: 12.357942

**Timetable:** January 15, 22, 23, 30, 9:30 a.m.  
Aula 13

