



Civil Engineering and Architecture - V.P. POSITION

DESCRIPTION OF THE PHD PROGRAM

The PhD program in Civil Engineering and Architecture aims to provide students with first-rate knowledge on the main civil engineering topics, with theoretical and specialized application training in various disciplines that form the basis of human settlement interventions on the territory and on city building. The educational program deals with three research areas: 1) Infrastructure and Land Engineering; 2) Structural and Geotechnical Engineering; 3) Architecture and cities.

The sub-area involved in this initiative is the Hydraulic Structure and Hydrology Research Group (area 1), whose activities cover the following main fields:

- evaluation of the impact of the global climate change on the future availability of water resources and on the frequency of extreme events (floods and droughts);
- laboratory scale models (dams, rivers, tunnels, sand boxes);
- numerical modeling of unsteady free surface flows and floodings, including by means of high speed computational devices (GPUs);
- hydrological modeling for surface waters at basin scale (rainfall-runoff models, continuous simulation of water resources in natural catchments) and groundwater modeling (aquifer management, control and restoring of polluted aquifers, identification of pollutant sources).

The Group is composed by 8 researchers and has received more than 1.5 M€ funds in the last ten years from private companies and public Agencies; in the 2015 a member of the group (Renato Vacondio) won the competition of the SIR program funded by the Ministry of Education, University and Research (MIUR).

DESCRIPTION OF THE SCIENTIFIC FIELD & VISITING PROFESSOR PROFILE

The visiting professor shall have the specific engineering competences related to the development of numeric models for the “Climate Services” (as defined in the H2020 Programme). Said models have the goal to increase the resilience and the adaptation capacity of the territories to the superficial and underground water resources quantity changes and seasonal distribution, and the increased hydrologic risk in a fluvial context. The H2020 research programme foresees various calls related to the so-called “Climate Services”. The inclusion of a professor with this profile to the Professors College of the Civil Engineering and Architecture PhD shall provide for the opportunity to prepare proposals for this type of calls, integrating the knowledge and the competences that the other College members already dispose of.

DESCRIPTION OF THE DIDACTIC ACTIVITIES OF THE VISITING PROFESSOR

The didactic activities foresee the dispatch of teacher-led lessons (a minimum of 20 hours/year) in the areas related to the issues in the field of environmental issues, computational fluid dynamics and hydrologic analysis needed to evaluate the mid and long-term induced effects on the water resources and on the hydrologic risks arising from climate change. These lessons shall take place as part of the Doctoral School in Engineering and Architecture and shall be open to students from other scientific PhD programmes of the University of Parma (Physics, Earth Science, Biotechnology and Bioscience, Food Science etc.). At the end of the lessons cycle, it shall be possible to do a final exam in order to acquire the course credits needed to reach the minimum credit requirements in order to pass to the next year, as provided for in the Doctoral School Regulation. At the end of the presence period of the visiting professor, there shall be a study day open to the scientific community interested in the matter.

Presence at the University of Parma: at least 3 weeks/year