



Environmental Engineering Curricula assessment in the global world

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Environmental engineers are technicians with specific expertise on the sustainability of human presence in the environment. Among other global dilemmas, to the environmental engineers it is often demanded to be able in developing systematic, innovative solutions in order to simultaneously meet water and energy needs, to build resilience to natural and technological disasters, to more accurately gauge and manage countries' greenhouse gas emissions. The general objectives of the Environmental Engineers are to establish actions of environmental sustainability as well as to verify progress toward global goals or international commitments. The globalization of challenges and problems to be faced, leads, in general, to the globalization of the engineering profession. In particular, since the environmental issues are without boundaries, and many and different are the involved professions and the competences, the environmental engineer must have a multidisciplinary and interdisciplinary approach to adequately answer to the demand of technical innovative knowledge at global scale. The environmental engineers, more and more, are involved in international projects where the effective collaboration requires not only the capacity to communicate in a common technical language, but also the assurance of an adequate and common level of technical competences, knowledge and understanding. The Europe-based EUR ACE system, currently operated by ENAEE - European Network for Accreditation of Engineering Education, can represent the proper framework and accreditation system in order to provide a set of measures to assess the quality of engineering degree programmes in Europe and abroad. In the global frame of the knowledge triangle: education-innovation-research, the accreditation and quality assurance of engineering curricula in Europe is discussed with reference to the Environmental engineering curricula, of the 1st and 2nd cycle, based on the European Credit Transfer System and in accordance with the Bologna Process, offered at School of Engineering, University of Firenze. The application of the accreditation model EUR-ACE to the multidisciplinary first cycle degree in Civil, Building and Environmental Engineering and the more specific second cycle degree in Environmental Engineering is discussed. Particularly, the critical issues to guarantee the quality and the status of environmental engineering graduates, in terms of applying knowledge capacities and technical innovative competences are examined. The expected learning outcomes of the quality assessment according the Dublin descriptors or the more engineering focused EUR-ACE skill descriptors, and at local and global scale are analysed. The system for educating engineers in communicating knowledge and understanding, making informed judgments and choices, capacities to lifelong learning is also assessed. The involvement of the professional working world in the definition of goals in skills, of typical expectations of achievements and abilities, and in general in comparing the teaching profile with the actual needs of the technical workforce, is described. With the aim to promote the innovative aspects related with the environmental engineering education, the important role that science and technology could play is also taken into consideration.