



News in engineering education in Spain effective from 2010 in presence of external changes and mixed crisis, looking mostly to agro and civil engineers

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The engineering careers models were diverse in Europe, and are adopting now in Spain the Bologna process for European Universities. Separated from older Universities, that are in part technically active, Civil Engineering (Caminos, Canales y Puertos) started at end of 18th century in Spain adopting the French models of Upper Schools for state civil servants with exam at entry. After 1800 intense wars, to conserve forest regions Ingenieros de Montes appeared as Upper School, and in 1855 also the Ingenieros Agrónomos to push up related techniques and practices. Other Engineers appeared as Upper Schools but more towards private factories. These ES got all adapted Lower Schools of Ingeniero Tecnico. Recently both grew much in number and evolved, linked also to recognized Professions. Spanish society, into European Community, evolved across year 2000, in part highly well, but with severe discordances, that caused severe youth unemployment with 2008-2011 crisis. With Bologna process high formal changes step in from 2010-11, accepted with intense adaptation. The Lower Schools are changing towards the Upper Schools, and both that have shifted since 2010-11 various 4-years careers (Grado), some included into the precedent Professions, and diverse Masters. Acceptation of them to get students has started relatively well, and will evolve, and acceptance of new grades for employment in Spain, Europe or outside will be essential. Each Grado has now quite rigid curricula and programs, MOODLE was introduced to connect pupils, some specific uses of Personal Computers are taught in each subject. Escuela de Agronomos centre, reorganized with its old name in its precedent buildings at entrance of Campus Moncloa, offers Grados of Agronomic Engineering and Science for various public and private activities for agriculture, Alimentary Engineering for alimentary activities and control, Agro-Environmental Engineering more related to environment activities, and in part Biotechnology also in laboratories in Campus Monte-Gancedo for Biotechnology of Plants and Computational Biotechnology. Curricula include Basics, Engineering, Practices, Visits, English, "project of end of career", Stays. Some masters will conduce to specific professional diploma, list includes now Agro-Engineering, Agro-Forestal Biotechnology, Agro and Natural Resources Economy, Complex Physical Systems, Gardening and Landscaping, Rural Genie, Phytogetic Resources, Plant Genetic Resources, Environmental Technology for Sustainable Agriculture, Technology for Human Development and Cooperation.