

Teaching of engineering design in forest engineering program: An evaluation of situation and improvement possibilities in Faculty of Forestry, Istanbul University

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Abstract: Engineering design is a systematic, intelligent process in which designers generate, evaluate, and specify concepts for devices, systems, or processes whose form and function achieve clients' objectives or users' needs while satisfying a specified set of constraints. The designer must combine different disciplines dealing with engineering area in a designing process. In general, forest engineers may not produce devices but plan some processes and generate artificial systems in Turkey. As an example of engineering design in forestry, afforestation or reforestation activities can be shown. Forestation process needs to combine the knowledge on meteorology, soil science, ecology and techniques on cultivation under defined social conditions and restricted economic budget. Similarly, restoration of any habitat in wildlife needs to design a new life system by using zoological, botanical and ecological knowledge and technical methods regarding specific socio-economic sources and conditions. According to criterion set for accreditation, any engineering program must prove that alumni can design at least a product or process by using basic sciences, techniques and social or economic principles learned from different courses in the program. Regarding that criteria, it has been started to be discussed under the framework of the curriculum of forest engineering program in Faculty of Forestry of Istanbul University on teaching of engineering design before accreditation of the program. At the education period of 2011 – 2012, two new courses titled as Engineering Design I (at 7th semester, 0 hour theory, 2 hours application, 1 credit and 4 ECTS) and Engineering Design II (at 8th semester, 0 hour theory, 2 hours application, 1 credit, 3 ECTS) have been agreed upon in Forest Engineering Division. Students in the program have participated these courses in the education period of 2014-2015. Thus, teaching of engineering design in any forestry program in Turkey has started for the first time in our faculty. A document on Principles of Teaching Rules for Engineering Design I and II has been prepared by managers of the division responsible for the program. After first education period, important problems were observed in the design of the courses and teaching approach. The document on teaching principles was mainly revised. Two courses in 7th and 8th semesters were combined as Engineering Design at 7th semester (0 hour theory, 4 hours application, 2 credit and 7 ECTS). The aim of this study is to discuss the teaching approach of engineering design regarding official document on teaching principles and the experiences in the period of first three years. Under the framework of this study), official documents, evaluation reports and products generated by students of Engineering Design courses were investigated and compared with accreditation criteria and general understanding on engineering design in the literature. As a result, it is seen that courses titled as engineering design have focused on investigation of any subject in forestry. Principles in official documents have important weakness for teaching process on design and could not generate a system to facilitate integration of different disciplines of forestry sciences under a design process. Reports generated by students in Engineering Design course could not prove to win a design competence in forestry.

Keywords: Engineering design, Forest engineering, Education, Accreditation