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CHALLENGES FOR THE THIRD MILLENNIUM

Challenges of the Education in Civil Engineering

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ABSTRACT

The education in civil engineering has traditionally been rather theoretical and based strongly on mathematics and physics. Nowadays however, the basic education, starting already from high schools, has weakened the role of mathematical subjects, yielding huge gaps in mathematical capabilities and in logic problem solving preparedness of new student generations.

Nowadays as a teacher of Structural Mechanics, I meet continuously Master-students who do not know what trigonometric functions are, or how to differentiate them – or who have still some more fundamental lacks in their knowledge. It is extremely challenging to teach them successfully some more sophisticated theories of mechanics. I see that the role of mathematics is irreplaceable in addition to give tools to solve mathematical equations derived, but also as a tool to develop individual's capability to logically formulate and solve various problems. Civil engineering has not been the most popular option between students when they are choosing after the high school studies their discipline for the future and entering Universities. Therefore, those ones who are not most talented nor interested in mathematical subjects have a good possibility to apply for engineering sciences including both civil and mechanical engineering. In the studies then, the weak fundamental knowledge of basics does not generate bigger interest in theoretical studies. But because the Universities have defined at the same time their goal in shortening the years students will use with their studies at the Universities, it is more or less forbidden to let them fail in examinations. This would lengthen their studying times. Finally, this path lead to the situation where the traditional knowledge of the graduates is alarming low. The results can be seen more and more often in collapsing roofs and structures and numerous of other problems and accidents in building sector.

Another problem inside civil engineering is the continuous extending of the discipline covering many areas which are supporting on biosciences, chemistry etc. Consequently, the expectations for the contents of Bachelor studies are very different. However, at the Universities, the idea about common fundamental studies for all civil Engineering students is very strong, and therefore the contents adopted must be a compromise, which actually does not satisfy anybody.

In this paper a new strategy to organize the Universities' practices is presented. It is based on the idea of free movement inside the University, following the interest and success of each student individually. It guarantees however that each discipline and department will get students with relevant basic education without any compromises. The strategy is very liberal and gives a student a possibility to choose his/her field by taking into account their own interest, but is then strict with all the requirements set for the education. It will also exclude all compulsory courses which do not support directly the objective of own studies.