

COURSE “DESIGN OF ALUMINIUM ALLOY STRUCTURES” (2 CFU – 16 HOURS)

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ABSTRACT

Important structures made of aluminium alloys were erected all over the world. The current European standard (Eurocode 9) is an internationally recognized design tool but, unfortunately, it has not yet been directly integrated into the current Italian legislation.

In this framework and in view of future regulatory improvements and integrations, it is important to provide both to researchers and designers a general overview of theoretical, technological, design, regulatory and application issues of this new building material, for which in the last years a special Italian CNR Committee delivered the CNR-DT 208/2011 standard, which is a substantial document concerning technical instructions for the design of aluminium alloy structures.

In the specific context of the course, starting from the study of the basic material and through the specular comparison with steel, firstly the prerogatives of the various aluminium alloys and the production processes for the realization of the different structural sections will be examined. Secondly, based on the standard code provisions, the design rules for members, connections and joints will be analysed both from the theoretical and applicative viewpoints. Finally, design criteria of aluminium alloys structures will be presented and discussed, showing how this structural technology can be competitive with other building materials, including steel. In fact, numerous applications of aluminium alloy structures in Italy and all over the world in the sectors of large roofs, walkways, bridges, towers and off-shore industry civil works demonstrate the potential of this new family of materials.

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