FA3 Railway Engineering

LEARNING OBJECTIVES

The Railway Engineering track aims to train engineers combining a solid preparation in the fundamental subjects of mechanical engineering with an advanced knowledge of railway engineering, with particular reference to the design and operation of railway vehicles.

Therefore, the didactic plan of this track consists of a group of compulsory courses of a general nature, together with specialized courses covering the dynamics and design of railway vehicles and electrical systems for railway transport. Finally, several elective courses are offered, which students can use to complement their skills, addressing specific aspects of railway engineering of their interest.

PRE-REQUISITES

There are no specific prerequisites for students taking the Railway Engineering track, but a good knowledge of the fundamental topics in mathematics, physics, applied mechanics, machine construction, electrical engineering, and thermodynamics is expected.

LEARNING OUTCOMES

The master's graduates in the Railway Engineering track have a broad range of skills, allowing them to operate in any sector of mechanical engineering, particularly in the areas of the design of mechanical systems and their operation. They also have advanced skills in the field of vehicles and railway systems and are, therefore, specifically prepared to work in the design, operation, and management of the railway systems sector.

FA3 Railway Engineering

JOB OPPORTUNITIES

The master's graduates in the Railway Engineering track may find jobs in any company/body operating in the mechanical engineering sector. The specific skills acquired in this track make them particularly suitable for taking advanced working positions in the railway industry, e.g., with vehicle manufacturers/integrators, first and second-tier suppliers, as well as railway service companies (operators, infrastructure managers, ...). The railway sector is of great significance for the European industry. There is currently a strong imbalance between many highly qualified job positions and the limited availability of graduates with specific skills.

PARTNER UNIVERSITIES

Politecnico di Milano, and specifically the Department of Mechanical Engineering, is recognized as outstanding in railway-related research. Over the last four decades, strong links and cooperation have been established with the sector's main academic and industrial research centers. By way of example, we mention here the collaborations with Central Queensland University (CQUniversity, Australia), Peking University (PKU, China), Southwest Jiaotong University (SWJTU, China), Technische Universität Berlin (TU Berlin, Germany), Instituto Superior Técnico (IST, Portugal), Universitat Politècnica de València (UPV, Spain), Chalmers Tekniska Högskola (Chalmers, Sweden), Kungliga Tekniska Högskolan (KTH, Sweden), University of Huddersfield (UK), University of Southampton (Soton, UK), and Virginia Tech (VT, USA). Given the relevance of industrial research in the railway sector, it is worth mentioning here also current and past research cooperation with (e.g.) Alstom, CRRC, Hitachi Rail, Lucchini, MerMec, ATM, RFI, Trenitalia, Trenord, Mercitalia, DB, SNCF, Chinese Academy of Railway Sciences, Korean Railway Research Institute, Railway Technical Research Institute Japan, Transportation Technology Center USA.

For further info and courses, please refer to the Educational Rules available on the School website: **https://www.ingindinf.polimi.it/formazione/regolamenti-didattici**