POLITECNICO MILANO 1863

CM2 Materials Design and Processing for Industrial Engineering

LEARNING OBJECTIVES

The Materials Design and Processing for Industrial Engineering track aims to train mechanical engineers with interdisciplinary and multidisciplinary skills capable of connecting the production process, microstructure, and material properties. These skills will be complemented by a strong foundation in the entire product life cycle, from raw materials to the component end-of-life management. Additionally, competencies related to emission reduction and circular economy are essential for continuous innovation in processes and products.

Therefore, students in this program are required to take a specific course on materials for industrial and engineering purposes, advanced courses in classical mechanics, and specific courses on sustainability, emission reduction, circular economy, and innovation. Moreover, students are offered numerous elective courses to deepen their expertise in energy efficiency, advanced controls and measurement systems, data analysis systems, and the latest testing methods.

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PRE-REQUISITES

Students opting for the Materials Design and Processing for Industrial Engineering track are not required to have specific prerequisites. However, a strong foundation in basic skills (mathematics and physics) and in-depth knowledge of metallurgy are recommended. Curiosity is also necessary to tackle and solve complex, interdisciplinary, and multidisciplinary problems.

LEARNING OUTCOMES

Mechanical engineers focusing on Materials Design and Processing for Industrial Engineering are professionals with a broad cultural background. Thanks to the exploration of related subjects (ranging from the dynamics of mechanical systems to machine design), they can address complex problems related to materials in various fields of industrial engineering.

JOB OPPORTUNITIES

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PARTNER UNIVERSITIES

There are numerous collaborations with prestigious international universities. For illustrative purposes, some of the universities where students in the Materials Design and Processing for Industrial Engineering program have completed their theses in the last year include: Montanuniversität Leoben (Austria), Technische Universität Graz (TU Graz, Austria), Universiteit Gent (UGent, Belgium), McMaster University (MAC, Canada), Yanshan University (YSU, China), University of Oulu (Finland), École nationale supérieure des mines de Saint-Étienne (ENSM-SE, France), European Synchrotron Radiation Facility (ESRF, France), Université de Technologie de Compiègne (UTC, France), Otto-von-Guericke-Universität Magdeburg (OvGU, Germany), Rheinisch-Westfälische Technische Hochschule Aachen (RWTH Aachen, Germany), Universidad de Oviedo (Spain), Luleå Tekniska Universitet (LTU, Sweden), Conseil Européen pour la Recherche Nucléaire (CERN, Switzerland), École Polytechnique Fédérale de Lausanne (EPFL, Switzerland), Technische Universiteit Delft (TU Delft, The Netherlands), and University of Nottingham (UoN, UK).

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