SCIENCE AND TECHNOLOGY | INTERNATIONAL PROGRAMMES

# Master in Materials and Sensor Engineering for Environmental Sustainability MSE

ALMA MATER STUDIORUM · UNIVERSITÀ DI BOLOGNA

## ITALIAN UNIVERSITY DEGREE SYSTEM

The degree structure at the University of Bologna is based on the so-called Bologna Process.
The most central aims of the Bologna Process include increased mobility, transparency of education systems, comparability of degrees and quality assurance at various levels.

- **1ST CYCLE, THE LAUREA DEGREE**
(180 credits/3 years = Bachelor's degree).
- **2ND CYCLE, THE LAUREA MAGISTRALE DEGREE**
(120 credits/2 years = Master's degree).
- **3RD CYCLE, THE DOTTORATO DI RICERCA AND THE DIPLOMA DI SPECIALIZZAZIONE**
(leading to a postgraduate degree = PhD and Specialisation degree).

The University of Bologna offers ***advanced scientific programmes*** or higher ***continuing education studies (professional master's programmes)*** open to the holders of a 1st cycle or 2nd cycle or comparable foreign degree.
Length: minimum 1 year; workload: 60 credits at least.
These qualifications are called ***Master universitario di primo or secondo livello*** and do not give access to the 3rd cycle in Italy.

Official description of the italian degree system:

*http://www.study-in-italy.it/study/new-degrees.html*

# Materials and Sensor Engineering for Environmental Sustainability (MSE)

## Two-year Master's Degree Programme Laurea Magistrale

Category | 2nd cycle Degree
Language | English
Course Office | Bologna [UNIBO] - Stockholm [KTH]
CDL Code | 8490
Course class | LM-22 Chemical Engineering
ECTS credits | 120
CDL President | Prof. Ferruccio Doghieri
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*Development of new materials with innovative properties discloses the way to new solutions in many different fields. The aim of MSE is to prepare highly-qualified researchers and professionals able to develop and implement innovative devices/processes based on new materials and regulation systems. Among the issues studied during this Master's there will be design and optimisation of industrial processes, implementation of solutions for environmental protection and development of new tools for biomedical applications.*

## LEARNING OUTCOMES

Master's students will attain:

- knowledge in traditional and new materials, as well as in their properties, characterization, finished products, and waste management;
- knowledge about fundamentals of physical, chemical and technological parameters of control systems for their application as evaluation methods. This will allow students to understand the function of microcomputers, to recognize processing data techniques and to know the requirements of signal processing;
- knowledge about production processes and products, which will allow students to develop their ability to foresee and diagnose environmental problems related to industrial processes.

## REQUIREMENTS AND/OR ADMISSION TESTS

All students with a higher education degree in Engineering, Physics or Chemistry corresponding to a 1st cycle University Degree (Bachelor's Degree) or a comparable qualification (180 ECTS credits) can apply to MSE. Students must also be proficient in the teaching language. Tuition scholarships and financial aids for partially covering life costs in Stockholm, are available.

## PROGRAMME CONTENT

MSE is a four semesters programme, and consists of 120 ECTS credits (30 credits per semester). The study programme is organised in three modules: module I-Industrial Process Design; module II-Materials Science; module III-Sensors Systems. Students will attend the fundamental courses in all the modules during first and second semester at UNIBO and will follow specialization courses at KTH in Stockholm, during the third semester. Fourth semester will be devoted to Master's Thesis.

## CAREER OPPORTUNITIES

MSE graduates will have the opportunity to work in research centres devoted to industrial and environment problems, R&D industrial divisions for process industries, materials production, biomedical applications. They can also find career opportunities in governmental and public agencies devoted to environmental protection and control.

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