ECOLE NORMALE SUPÉRIEURE DE L'ENSEIGNEMENT TECHNIQUE DE MOHAMMEDIA
UNIVERSITÉ HASSAN II DE CASABLANCA

Master in: Mechanics, Robotics and Innovative Materials (M-MRMI)

Mechanical Engineering Department
COORDINATOR OF THE PROGRAM
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CAREER OPPORTUNITIES AND INTEGRATION

Functions:
The MRMI master's degree prepares graduates for careers in research as well as design engineering in fields related to mechanics, materials and industrial robotics.
- Engineering careers
- Design office and consultancy engineer
- Research and development engineer
- Business engineer in mechanical engineering and industrial robotics
- Engineer in automation, industrial regulation and control of robotised industrial systems
- Project manager in mechanical engineering and robotics.
and robotics.
- Teaching and research careers
- Joining a research laboratory to prepare a doctorate
- Enter the teaching profession by taking the competitive examination for the agrégation in Mechanical Engineering

Sector:
The MRMI master's degree prepares graduates for careers in both research and design engineering in fields related to mechanics, materials and industrial robotics.
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OBJECTIVES OF THE PROGRAM

The "Mechanics, Robotics and Innovative Materials (MRMI)" Master's degree offers in-depth multidisciplinary theoretical, numerical and experimental training in the fields of mechanics, industrial robotics, innovative materials, modelling and numerical simulation of problems arising from industrial applications.
The Master MRMI is a 2-year course leading to a master degree.
In addition to fundamental scientific and technical teaching, this Master's programme is based on new collaborative approaches with industry and research through practical work and practical activities in the form of projects and research topics. In addition, this Master's programme is supported by the various research laboratories of the Ecole Normale Supérieure de l'Enseignement Technique (ENSET) in Mohammedia.
A large part of the teaching is carried out through reflective workshops and technical seminars to enable students to clarify what they have learnt, to appropriate other knowledge in the light of their own situation and to develop their career path.
The main aims of the teaching offered are to:
- The skills needed to meet the challenges of digital and technological change in Industry 4.0 and the robotics of the future.
- Offer in-depth scientific and technical knowledge in the fields of mechanics, industrial robotics and innovative materials.
- Acquire the skills and methodologies needed to carry out research and development work in a university research laboratory or in a socio-professional environment,
- Develop entrepreneurial, social and professional skills.

SKILLS ACQUIRED ON COMPLETION OF THE PROGRAM

Graduates of the MRMI Master's program will be multi-skilled 5-year postgraduates with the skills required to keep pace with developments in technology and the socio-economic world. These skills cover a broad spectrum of mechanical engineering, such as general mechanics, the mechanics of continuous media, geometric modelling, automation and industrial robotics, as well as fields relating to metallic and plastic materials and composite and innovative materials.
1) Scientific skills:
- Graduates of the MRMI master's degree will have a thorough understanding of the theoretical, methodological, numerical and experimental foundations of the fields of mechanics and industrial robotics (modelling and programming), through the use of industrial simulation and modelling codes for the mechanics of robotic systems.
- This course also provides students with know-how in conducting experiments to develop and characterise new innovative materials.

2) Cross-disciplinary skills:
- Technical communication and scientific English.
- Use of industrial simulation software (Abaqus, MatLab, etc.).
- General scientific and technical culture: Lectures on topics related to mechanics, materials, robotics and Industry 4.0.
- Introduction to project management, teamwork, writing a summary report and oral presentation of work using new digital tools.

An MRMI Master's degree holder must have the basic cross-disciplinary skills and specialised skills to
- Design, programme and analyse robotic mechanical systems,
- Define and characterise innovative materials for use in industrial fields,
- Use digital simulation and artificial intelligence tools in relation to the field,
- Implement automatic control, automation and robotics tools in an industrial system,
- Lead research, development and design office teams,
- Respect the principles of ethics, professional conduct and environmental responsibility.

ACCESS CONDITIONS :

- ADMISSION REQUIREMENTS :

Candidates holding degrees (Bac + 3) directly related to mechanical and industrial engineering such as:
- Basic, professional or science and technology degree
- Diploma recognised as equivalent with the necessary prerequisites
- Specific educational prerequisites:
- Mathematical tools (bac+3 level)
- Basics of general mechanics and solid mechanics
- Basic strength of materials
- Basics of servo-control and regulation
- Basic knowledge of construction materials
- Basic computer science, algorithms and programming languages.