# **1. Program Title:**

**Doctoral Program in Mechanical Engineering** 

# 2. Language of Instruction:

#### French / English

### **3.** General Overview of the Program:

The doctoral program in Mechanical Engineering aims to reinforce the knowledge acquired during undergraduate studies and deepen expertise in three main areas: **Mechanical manufacturing and production**, **Materials Engineering**, and **Energy**. It is closely aligned with the research topics developed by the associated laboratory.

Workshops, seminars, and lectures will introduce doctoral students to fundamental and applied research, promoting perseverance, teamwork, and knowledge sharing.

Faculty members have been selected for the relevance and quality of their research, in line with the program's objectives. Coming from Algerian and international universities, they provide students with updated knowledge and engage them in internationally recognized research methodologies and strategies.

The program encourages self-learning, scientific debate, and quality assessment through personal research work and oral presentations.

### 4. Research Focus Areas:

- Development of innovative materials
- Characterization of metallic sheets and polymers up to failure
- Numerical simulation of metal forming
- Analytical and numerical modeling of lubricated and dry contacts (tribology)
- Problem-solving in fluid mechanics

Research work is expected to lead to sustainable technological innovations and eco-efficient solutions for the industrial sector.

### 5. Core Courses:

- Research Methodology
- Introduction to Pedagogy and Didactics
- ICT (Information and Communication Technologies)
- Language Skills Enhancement

#### **Teaching Organization:**

- Courses are part of faculty members' academic responsibilities.
- Two hours of weekly specialization courses (by field or grouped).

- Common courses (ICT, research methodology, pedagogy) are shared across tracks.
- A doctoral logbook, mandatory for progress tracking, will be managed through the PROGRES digital platform.

# **6. Admission Information:**

Based on Decree No. 991 dated August 1, 2022 (Articles 4 to 8).

## 7. Basic Courses:

- Finite Volume Mechanics
- Fluid Mechanics
- Rheology
- Mechanical Simulation Codes
- Constitutive Laws
- Fracture Mechanics

# 8. Affiliated Laboratory:

#### Laboratory of Rheology and Mechanics

https://www.univ-chlef.dz/LABORATOIRES/LABO\_RM/laboratoire.htm

### 9. Research Teams:

#### Team 1: Mechanics of Materials and Surfaces (2MS)

Focus on mechanical, thermal, and environmental behavior of various materials. Models account for damage and cracking, linking material behavior to microstructure and fabrication processes. Tools include experimental setups and numerical simulations.

#### **Team 2: Fluid-Structure Dynamics**

Studies the vibrations caused by fluid flow (e.g., oil in pipelines), which can damage structures. Aim: minimize vibrations via predictive modeling using software like ANSYS, with validation from experimental data.