

## Company Description

**FACULTY OF ENGINEERING**  
Mondragon Unibertsitatea is a practical, innovative and committed University, focused on the development of people, oriented towards the needs of business and society, designed to meet the challenges of the real world and where knowledge and its application have no borders.

## Information

 **Deadline:** 2023-03-31  
 **Category:** Academia  
 **Province:** Gipuzkoa

 **Country:** Basque Country  
 **City:** Arrasate

## Company

Mondragon Unibertsitatea



## Main functions, requisites & benefits

### Main functions

A PhD position in failure prediction of thin walled structures by means of finite element (FE) models is offered by the Structural Mechanics and Design (DME) research group at the University of Mondragon. In recent times, consumers have modified their shopping habits, preferences and expectations. This change has led to a significant increase in the use of storage racking systems by the manufacturers of goods and products. In this sense, the DME research group is collaborating with a leading company AR-Racking since 2017 and an experimental laboratory has already developed to test different structures (ARLab [1]). The experience gained in this period, where several master thesis and a PhD thesis have been completed, has shown the need of investigating the failure beam-to-upright connections by advanced FE models. Different failure modes have been identified, such as upright perforation tearing, connector flange bending, connector flange tearing, beam denting or beam welding tearing. Therefore, it is expected that the PhD student will work in the development of new damage criteria and implement in the already developed finite element models. These new models must be first validated in simplified geometries (at specimen level) before moving on to the component models. Once these new models have been experimentally validated in various configurations, a parametric analysis will be carried out to study the deviation observed in the experimental tests, which is suspected to be due to the effect of the manufacturing tolerances of the components. A parametrized and automated finite element model generation tool will be available, as well as the component measurement procedures in the coordinate measuring machine (CMM), experimental bending tests on beam to upright joints, and calculation and analysis of the mechanical properties of stiffness and resistance according to standards. Inside the AR Lab - Research and Testing Laboratory for industrial racking, <https://www.youtube.com/watch?v=fajNfqMnTSA> (retrieved 2022/04/25)

### Requisites

**Specific Requirements Education level:** Applicants should hold a Master Degree in Mechanical Engineering, Industrial Engineering, or equivalent. **Other skills and experience (desirable):** Experience with Finite Element Method Software (preferably Abaqus) Programming skills (preferably Matlab or Python) Knowledge/experience with material characterization and constitutive modelling Experience with artificial intelligence / optimization methods.

### Benefits

We offer you to be part of a transforming and attractive educational project, in which you can develop your vocation and grow professionally and personally, in a respectful working environment, based on trust and cooperation.