Scheda Laboratori di Ricerca

Denominazione del Laboratorio	*Italiano* Laboratorio di Progetto e Costruzione di Macchine *Inglese* Machine Design Laboratory
Gruppo di Ricerca di Riferimento	*Italiano* Progettazione Meccanica Integrata Monitoraggio dell'Integrità Strutturale Ingegneria Inversa e Progettazione per la Stampa 3D (RE&DfAM) *Inglese* Integrated Mechanical Design Structural Health Monitoring Reverse Engineering and Design for Additive Manufacturing (RE&DfAM)
Descrizione sintetica delle attrezzature, della strumentazione e delle attività di ricerca	Machine Design Laboratory includes four sub-sections: an experimental mechanics laboratory on the ground floor dedicated to experimental testing, and three laboratories on the first floor dedicated to numerical mechanical simulations, prototyping and virtual reality, production processes. The laboratory is certified according to the UNI EN ISO 9001-2015 standard and focuses on product and process engineering, with a focus on experimental mechanics, computational mechanics, prototyping and simulation of industrial processes in immersive environments. The main activities of the experimental mechanics section include testing materials and structural components, with a range of investigations from material characterization to design with innovative materials and durability testing. The activities carried out on the other three sections concern: i) the numerical product modeling activities to understand and monitoring the structural behavior of mechanical components; ii) virtual prototyping, Design for Additive Manufacturing, 3D printing and development of Virtual Reality applications; iii) Digital Manufacturing and simulations of production processes. Main available equipment: - Zwick/Roell electromechanical testing machine equipped with 250 kN load cell; - StepLab UD040 fatigue testing machine equipped with 40 kN or 10 kN load cells; - MiniFactory ULTRA FFF/FDM 3D printer; - Ultimaker s5 FFF/FDM 3D printer;

	- Omniscan SX Phased Array Flaw Detector C-Scan; - Shining 3D Free Scan Ue Pro handheld laser scanner; - PCE-RT 1200 surface roughness tester; - 4 Workstations HP Z820: - 2 Workstations HP Z840; - 2 Workstations Dell precision 7920 Tower; - Microsoft Hololens Augmented Reality system; - HTC Vive Pro Virtual Reality system; - Meta Quest 2 Virtual Reality system.