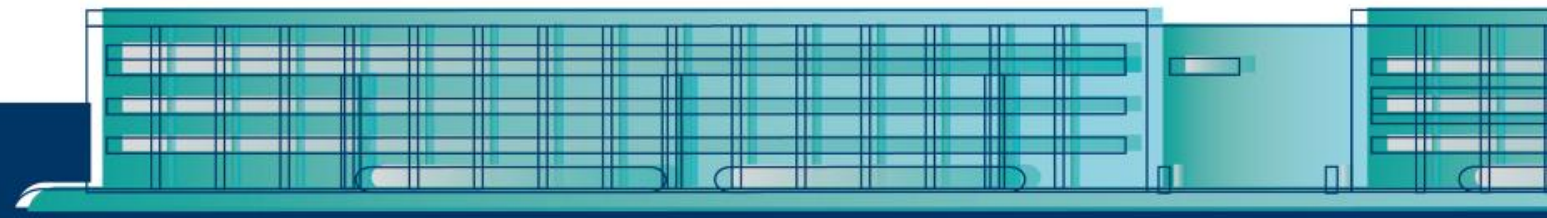
UNIVERSIDAD DE MÁLAGA | ESCUELA DE INGENIERÍAS INDUSTRIALES



# DOSSIER
# School of Industrial Engineering

ESCUELA DE INGENIERÍAS INDUSTRIALES

# CONTENTS



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# MISSION & VISION



## Mission

The training of highly qualified engineers through quality education, the promotion of research, and the strengthening of collaboration with the industrial and socio-economic sectors

## Vision

To be a benchmark in industrial engineering education, recognized for academic excellence, the relevance of its research, and its strong ties with companies and institutions

# EII IN NUMBERS




https://www.eii.uma.es

- One of the largest faculties of the University
- ~ 4,000 students
- ~ 490 Professors & Technical Staff
- ~ 800 students enrolled in first year

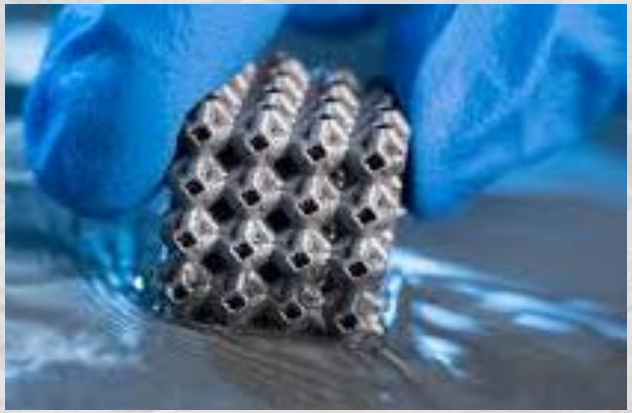
# EII IN NUMBERS

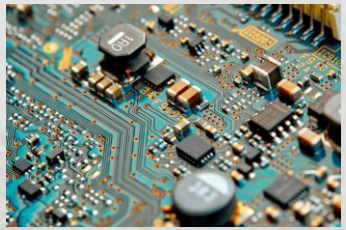


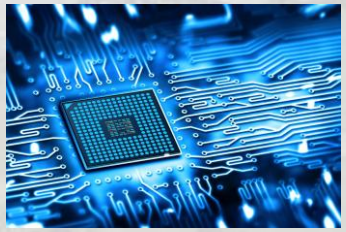
- The largest source of STEM talent in Málaga

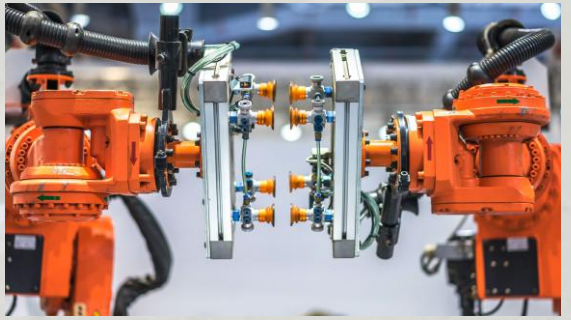
  Each year, ~550 engineers graduate, specializing in:

  - Industrial electronics & automation
  - Mechanics & complex systems design
  - Electrical, thermal & fluid engineering
  - Robotics, materials, & manufacturing processes









# EII IN NUMBERS



- 8 Bachelor's Degrees.
- 7 Master's Degrees.
- 3 PhD Programs

# SOCIAL NETWORKS



https://es.linkedin.com/company/escuela-de-ingenierias-industriales-uma

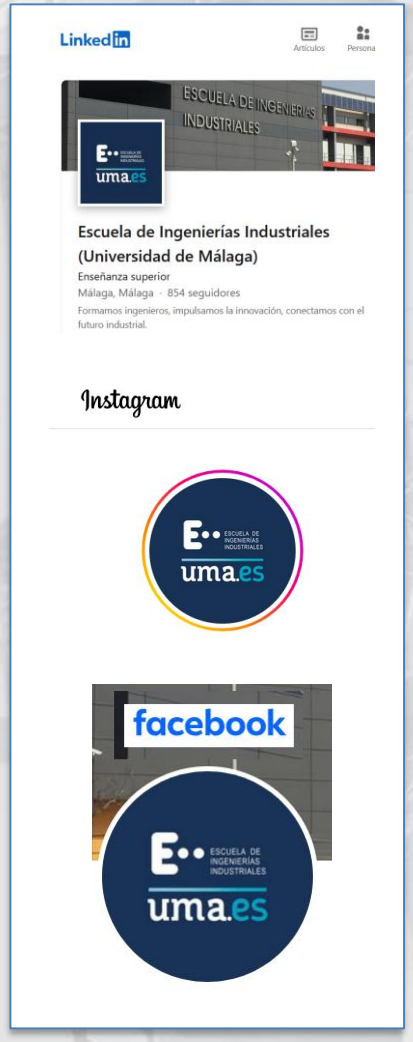
+1,400 followers

https://www.instagram.com/industrialesuma/?hl=es

+ 3,300 followers

https://www.facebook.com/industrialesUMA/?locale=es_ES

+370 followers



# BACHELOR'S DEGREES



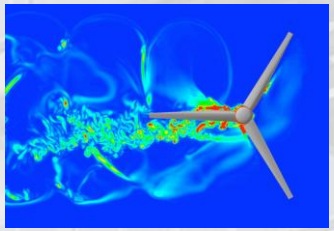
| | | | |
|---|---|---|---|
| Mechanical Engineering |  Mechanical |  Robotics and Mechatronics | Electronic, Robotics and Mechatronics Engineering |
| Electrical Engineering |  Electrical |  Industrial Management | Industrial Engineering and Management |
| Industrial Electronic Engineering |  Industrial Electronic |  Industrial Technologies | Industrial Technologies Engineering |
| Industrial Design and Product Development Engineering |  Industrial Design |  Energy | Energy Engineering |

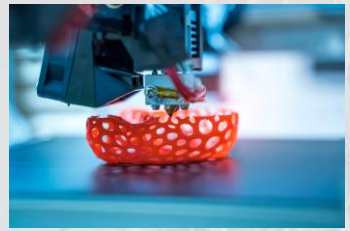
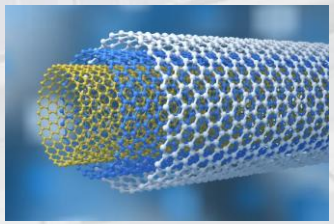
EUR-ACE®

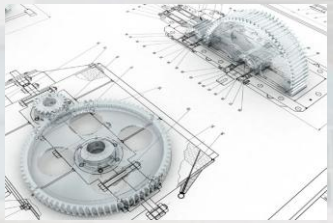
# Mechanical

## *Mechanical Engineering*

| Key Courses |
| --- |
| • Fluid Mechanics |
| • Machine Design |
| • Manufacturing Processes |
| • Strength of Materials |
| • Applied Thermodynamics |
| • Materials Engineering |
| • Structures and Industrial Constructions |
| • Graphic Engineering |
| • Metrology and Quality Control |



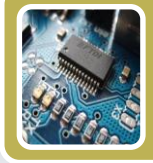



# Electrical

## *Electrical Engineering*

| Key Courses |
| --- |
| • Electrical Machines |
| • Electrical Drives |
| • Power Electronics |
| • Low, Medium and High Voltage Electrical Installations and lines |
| • Electrical Lines and Power Transmission |
| • Power Electrical Systems |
| • Analysis of Electrical Networks |
| • Automatic Control and Industrial Automation |
| • Power Plants and Renewable Energies |



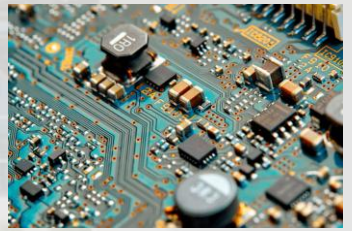
## Industrial Electronic

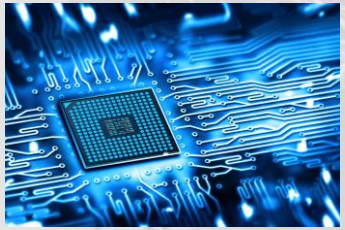
# *Industrial Electronic Engineering*

| Key Courses |
| --- |
| • Microelectronics |
| • Analog Electronics, Digital Electronics and Microprocessors |
| • Power Electronics |
| • Electronic Instrumentation |
| • Analog, Digital, and Power Electronic Systems |
| • Systems Modeling and Simulation |
| • Industrial Automation and Control Techniques |
| • Robotic Systems, Industrial Informatics and Communications |
| • Industrial Control and Automation Systems |

In the short term, the curricula will be revised to better align with current industry demands and emerging technological trends.

This process offers an opportunity for strategic collaboration, incorporating companies' specific competency requirements into academic program design.

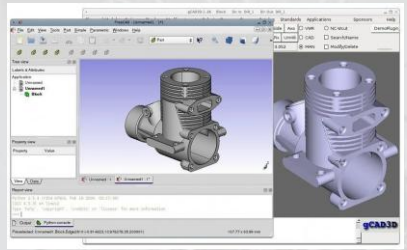


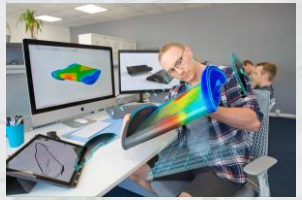


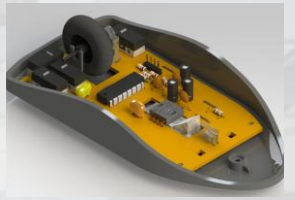
# Product Design

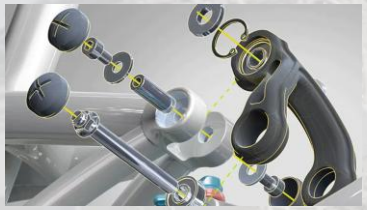
## *Industrial Design Engineering and Product Development*

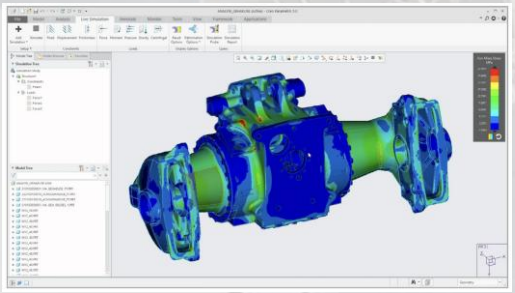
| Key Courses |
| --- |
| • Industrial Design Methods |
| • Invention, Patenting, and Industrial Design Protection |
| • Reverse Engineering and Prototyping |
| • Concurrent and Collaborative Engineering |
| • Sustainable Design, Eco-design and Eco-innovation |
| • Life Cycle Analysis, Business Strategy, Marketing Mix, Product Platform, Modular Design |
| • Packaging and Wrapping Design |
| • CAD Modeling and Simulation Processes |







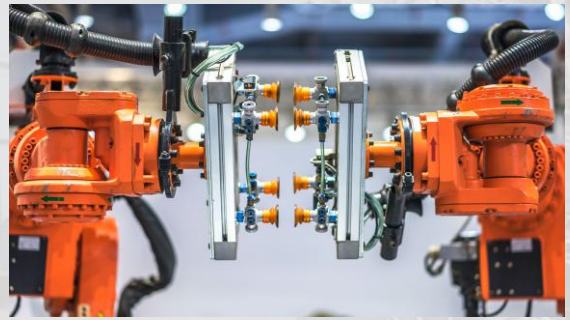


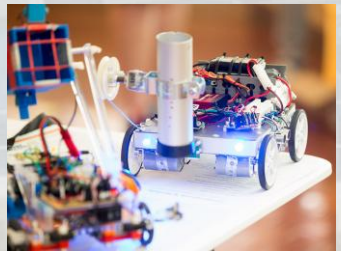


# Robotics and Mechatronics

## *Electronics, Robotics, and Mechatronics Engineering*

| Key Courses |
| --- |
| • Analog, Digital, Mixed, and Power Electronic Systems |
| • Electronic Instrumentation |
| • Microprocessors |
| • System modelling and simulation |
| • Control and Programming of Robotic Systems |
| • Industrial Control and Automation of Production Systems |
| • Electrical Installations and Machines |
| • Digital Networks |
| • Industrial Informatics and Communications in Automation |





# Industrial Management

## *Industrial Management Engineering*

| Key Courses |
| --- |
| • Industrial, Business and Project Management |
| • Production Systems |
| • Quality Management |
| • Occupational and Industrial Safety |
| • Maintenance Management Systems |
| • Human Factor in Organizations |
| • Strategic and Financial Management |
| • Logistics and Distribution |
| • Innovation Systems and Technological Competitiveness |



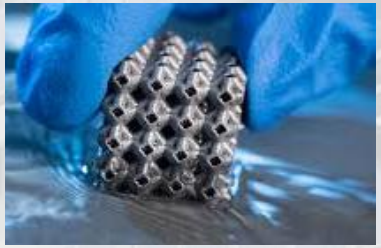




# Industrial Technologies

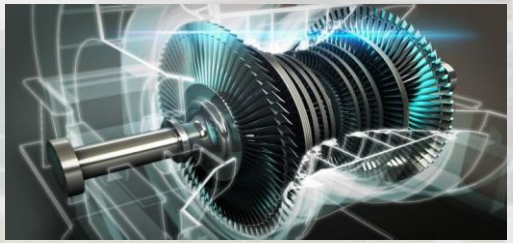
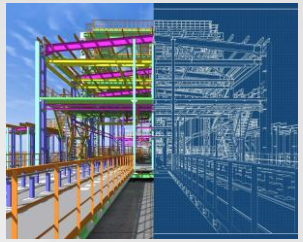
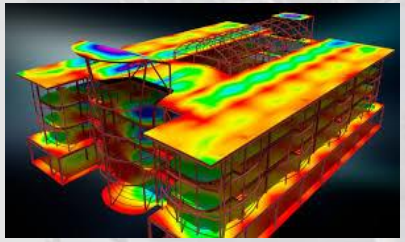
## *Industrial Technologies Engineering*

| Key Courses |
| --- |
| • Science and Engineering of Materials |
| • Manufacturing Engineering |
| • Automation, Electronics and Electrotechnics |
| • Electrical Installations |
| • Machines and Mechanisms |
| • Fluid Mechanics |
| • Thermal Engineering |
| • Strength of Materials and Structural Analysis |
| • Projects and Industrial Management |







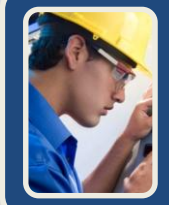
# Energy

## *Energy Engineering*

| Key Courses |
| --- |
| • Energy Analysis of Equipment, Processes, and Facilities |
| • Renewable Energies |
| • Thermal Installations in Industry and Buildings |
| • Medium and Low Voltage Installations. Electrical Machines |
| • Fluid mechanical systems and machines |
| • Thermal systems and machines |
| • Energy Project Management |
| • Environmental technologies and sustainability |
| • Energy production systems |

# MASTER'S DEGREES



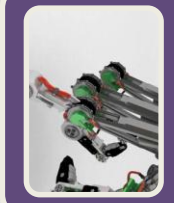


Industrial Engineering

Advanced Mechanical Engineering

Occupational Risk Prevention

Environmental Hydraulics



Mechatronics

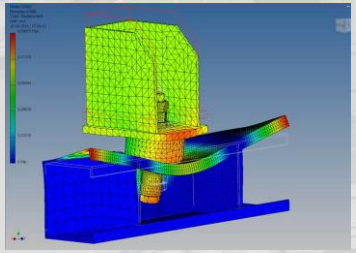
Engineering Design and Architecture

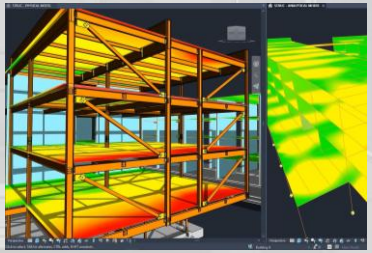
Smart Systems in Energy and Transport

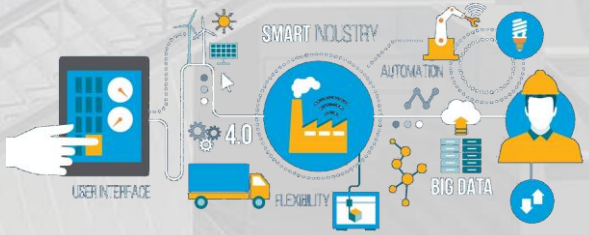
## Industrial Engineering

## *Master's Degree in Industrial Engineering*

| Key Courses |
| --- |
| • Advanced Manufacturing Systems |
| • Industrial Automation and Control |
| • Energy Efficiency and Sustainable Technologies |
| • Advanced Structural and Mechanical Design |
| • Business Management and Industrial Organization |
| • Quality Management and Control |
| • Research and Innovation in the Industry |
| • Project Management |
| • Industry 4.0 |



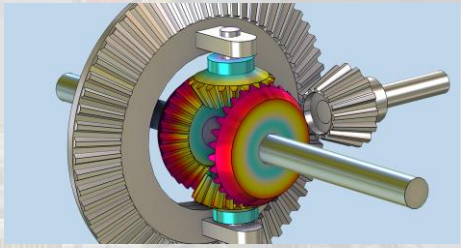


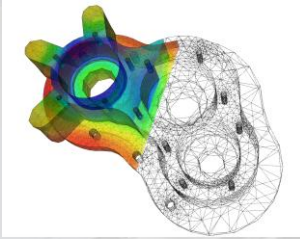


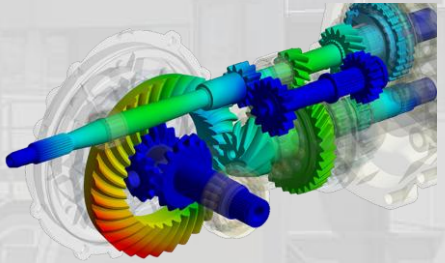
## Advanced Mechanical Engineering

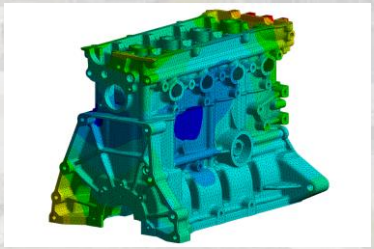
## *Master's Degree in Advanced Mechanical Engineering*

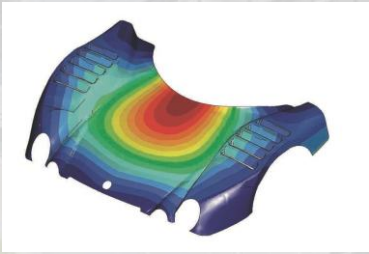
| Key Courses |
| --- |
| • Advanced Mechanics and Multibody Systems |
| • Design and Development of Mechanical Systems |
| • Advanced Design of Mechanical Elements |
| • Applications of Finite Element Method in Mechanical Analysis |
| • Design and Analysis of Composite Materials |
| • Advanced Manufacturing Processes and Dimensional Control Techniques |
| • Transportation Systems Engineering |
| • Mechanical Engineering Projects |

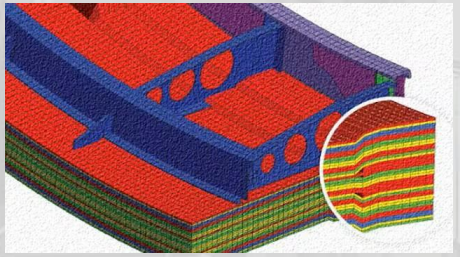


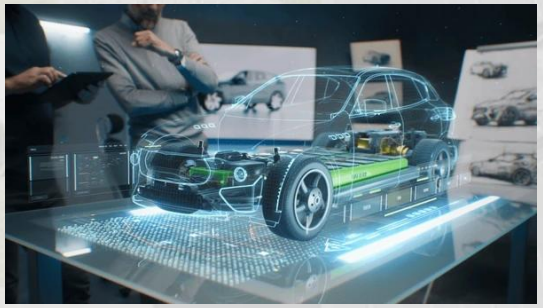










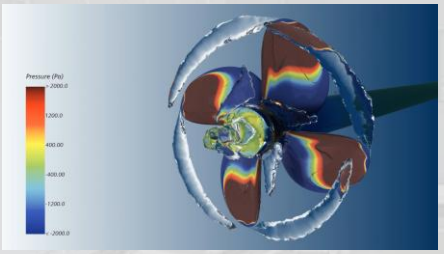


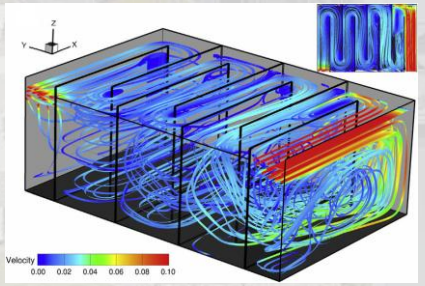
## Environmental Hydraulics

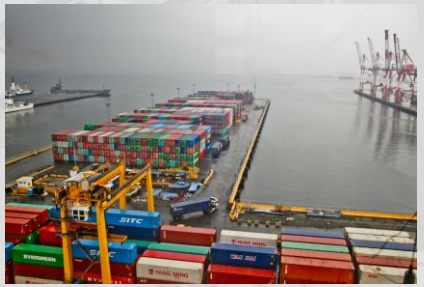
## *Master's Degree in Environmental Hydraulics*

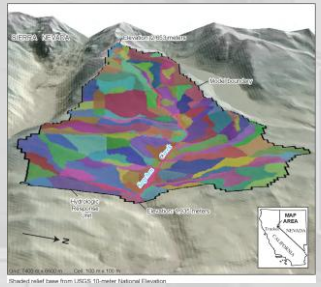
**Key Courses**

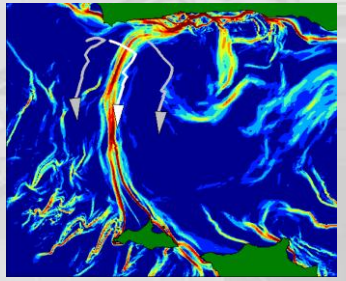
- Aero-Hydrodynamics of Vehicles
- Navigation and Optimization
- Propulsion and Control
- Experimental Techniques in Aerodynamics and Hydrodynamics
- Numerical simulation tools for fluid flow analysis
- Integrated Management of Ports and Coasts
- Integrated Watershed Management
- Aquatic Ecosystem Management
- Geophysical Flows

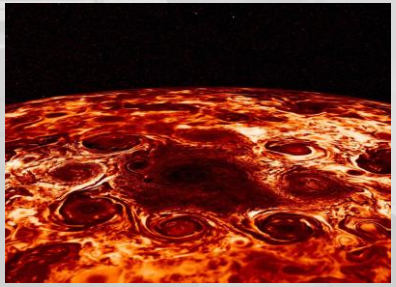








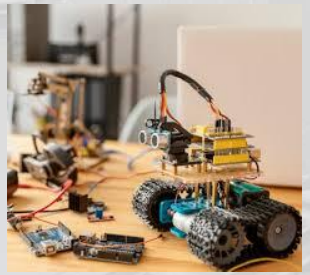




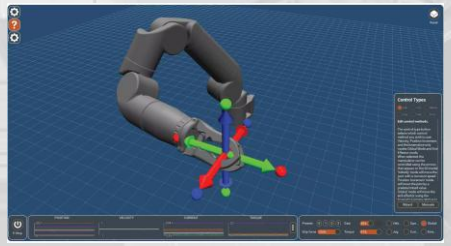
## Mechatronics

## *Master's Degree in Mechatronic Engineering*

| Key Courses |
| --- |
| • Modeling and Control of Mechatronic Systems and Robots |
| • Smart Sensors |
| • Real-Time Systems for Mechatronics |
| • Advanced Electric Actuators |
| • Intelligent Control Systems |
| • Modeling and Control of Robotic Systems |
| • Testing and Experiments for Evaluating and Validating Results in the Field of Mechatronic Engineering |




## Smart Systems in Energy and Transport

## *Master's Degree in Smart Systems in Energy and Transport*

| Key Courses |
| --- |
| • Industrial Communications Networks |
| • Smart Electric Grid |
| • Intelligent Systems for Data Processing and Decision Support |
| • Intelligent Buildings and Energy Efficiency |
| • Intelligent Transport Systems |
| • Advanced Vehicle Technologies |
| • Leadership, Management, and Control of Innovation Projects |


# Occupational Risk Prevention

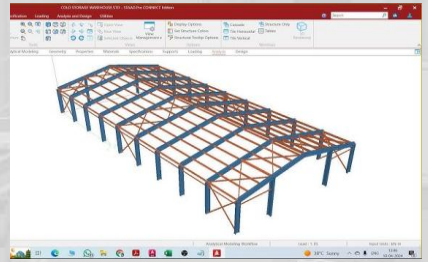
## *Master's Degree in Occupational Risk Prevention*

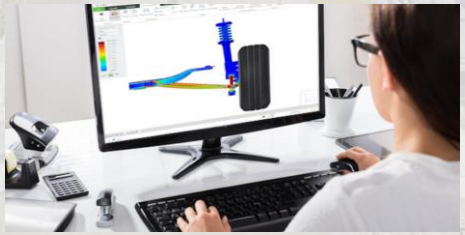
| Key Courses |
| --- |
| • Occupational Safety |
| • Industrial Hygiene |
| • Ergonomics and Applied Psychosociology |
| • Management of Prevention Systems |
| • Human Factor |
| • Legal Framework of Occupational Risk Prevention |

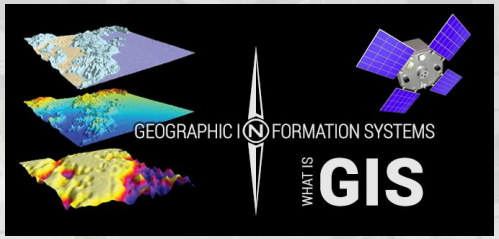
## Engineering Design and Architecture

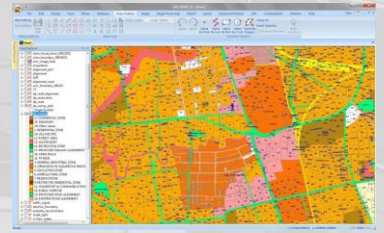
## *Master's Degree in Representation and Design in Engineering and Architecture*

| Key Courses |
| --- |
| • Landscaping, Garden Design, and Aesthetics of Industrial Buildings |
| • Application of CAD/CAM/CAE Tools for Industrial Design |
| • Advanced Geomatics, Remote Sensing, Geographic Information Systems |
| • 3D Representation of Structures |
| • Design and Analysis of Industrial Buildings |
| • Industrial Heritage |
| • Sustainable Design in Engineering and Architecture |







# PhD PROGRAMS

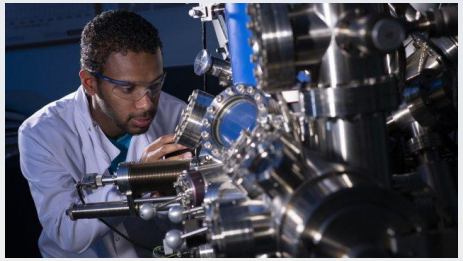


## Mechanical Engineering and Energy Efficiency

## Mechatronics Engineering

## Electrical Energy Systems

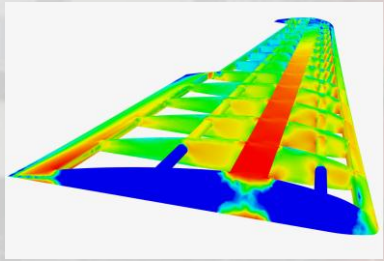
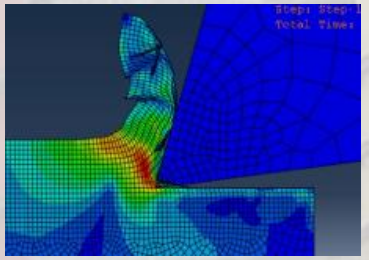
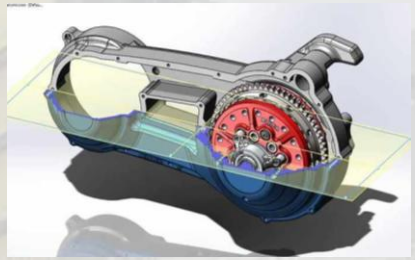
## Mechanical Engineering and Energy Efficiency



### Research Lines

- Mechanical and Materials Engineering
- Energy and Renewable Systems
- Mathematical Modeling in Mechanical Engineering
- Corporate Reputation, Design, and Representation in Mechanical Engineering

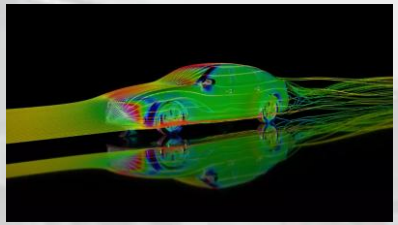


## Mechatronics Engineering

### Research Lines

- Robotics and Intelligent Control Systems
- Fluid Mechanics, Smart Materials, and Structures
- Smart Electrical and Electronic Systems
- High-Performance Computing

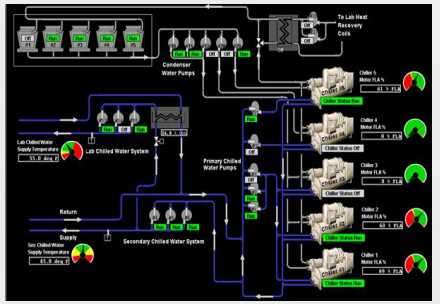


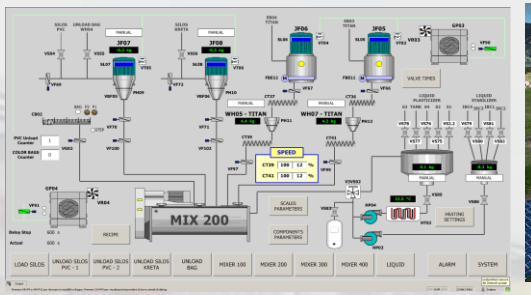



## Electrical Energy Systems

### Research Lines

- Power System Planning
- Power System Supervision and Control
- Transient Regime and Stability in Power Systems
- Integration of Renewable Energy into the Grid
- Application of FACTS in Transmission and Distribution Networks
- Electricity Markets
- Electrical Drives and Machines






# TECHNICAL SKILLS



- Microelectronics;
- Analog & Digital Electronics;
- Electronic Instrumentation;
- Microprocessors;
- Mechatronics;
- Robotic Systems;
- Environmental technologies and sustainability;
- Mechanical design;
- Manufacturing;
- Materials;
- Logistic;
- Supply chain;
- Safety and risk prevention;
- Quality control and reliability.

- **Software: Cadence; Vivado; Ansys; Multisim;…**

# BEYOND TECHNICAL SKILLS



## Engineers with Vision, Leadership, and Cross-Disciplinary Skills:

We educate engineers not only in science and technology, but also in professionalism, leadership, and the ability to collaborate across disciplines.

By emphasizing soft skills, we prepare our graduates to lead international teams and manage complex, multidisciplinary projects.

Well-rounded engineers, prepared to drive innovation and tackle complex challenges.

# STUDENTS' COMPETITION TEAMS



*UMA Racing Team: MOTOSTUDENT Competition*

*MÁLAGA Racing Team: FORMULA STUDENT Competition*

*ROBORESCUE UMA: ROBO CUP RESCUE Competition*

# STUDENTS' COMPETITION TEAMS



*UMA ASHRAE Branch:*
*Hospital climatization competition*

*Autonomous Driving Team Málaga:*
*Autonomous car competition*

*UMA Aero Team:*
*UAV manufacturing competition*

# INTERNSHIPS IN COMPANIES



Internships are **fully integrated** into all engineering degrees.

Over **400 students per year** gain real experience in leading companies:

DEKRA · PREMO Innovating in Magnetics · KEYSIGHT · TDK · Schindler · DENSO TEN · accenture

Students work on **real-world tasks**: design, simulation, automation, manufacturing, and more.

This prepares them to **contribute immediately** in high-tech environments.

# The international UMA–Fulda–EDAG program

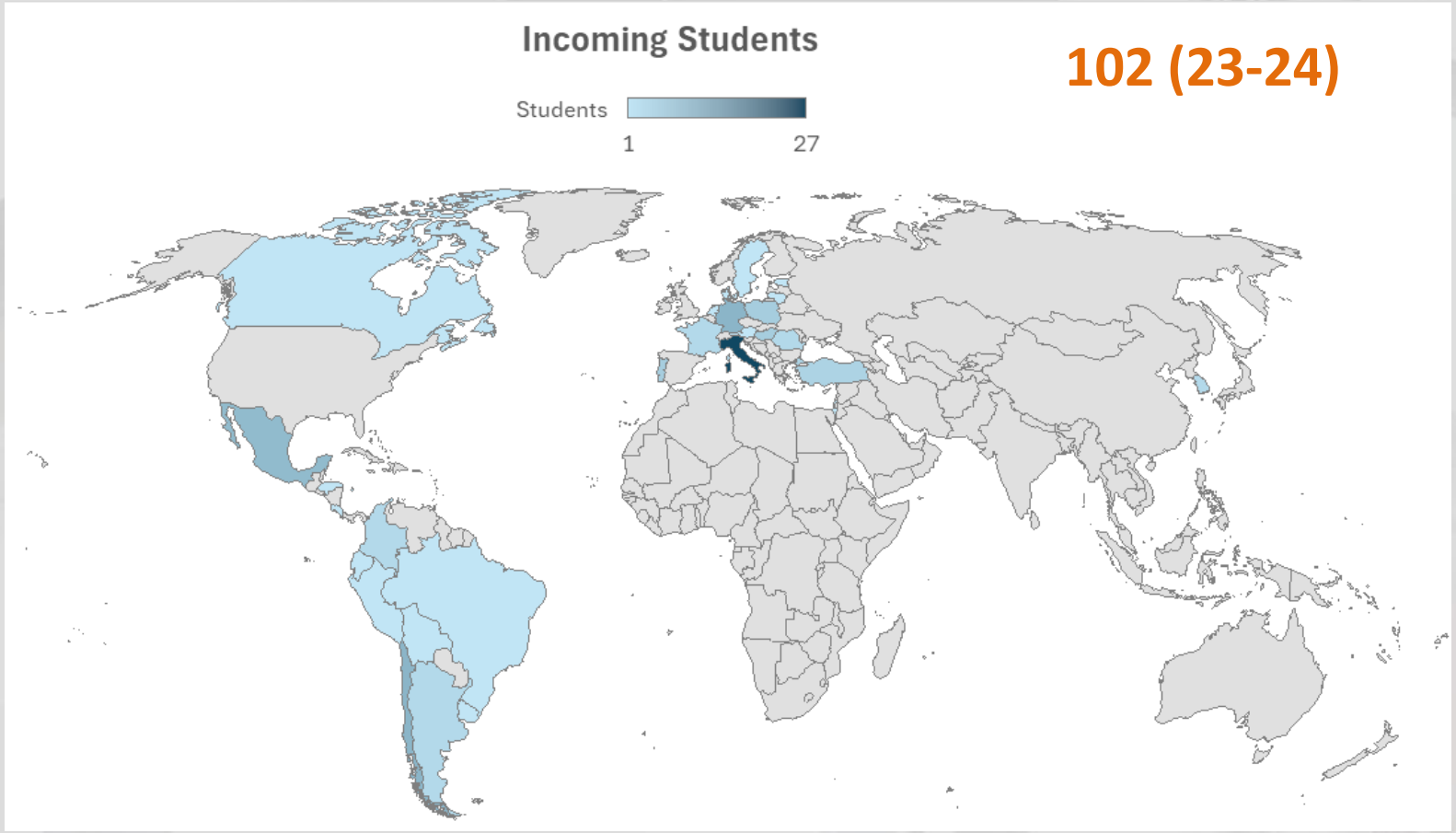
It offers engineering students the opportunity to combine academic training in Fulda University (Germany) with paid internships at EDAG, a leading automotive engineering company.

Students spend 12 months in Fulda University with a dual-study model that integrates university courses with hands-on industrial experience.

After that, the student is hired by EDAG for at least 2 years.

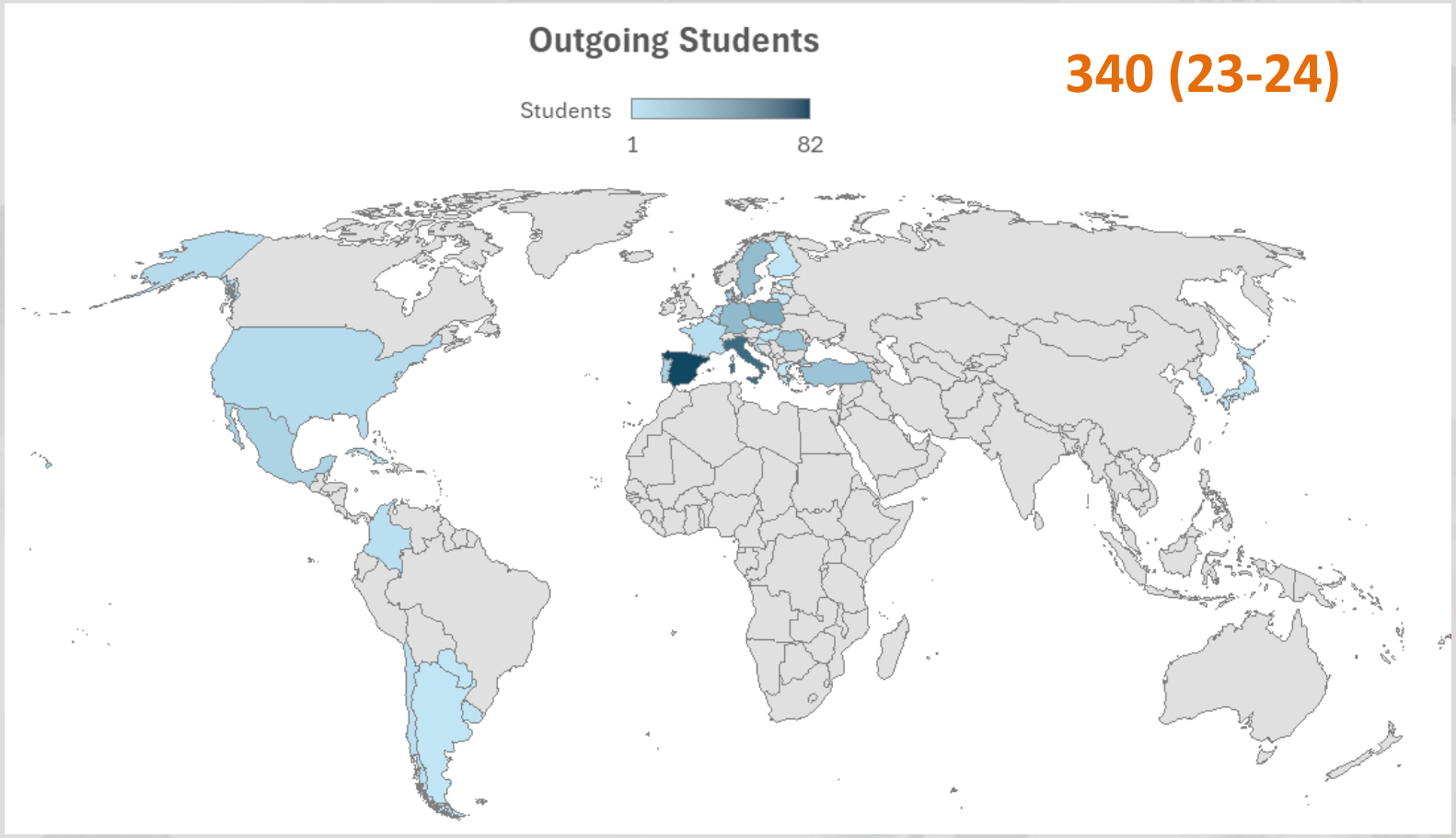
In the last 3 editions, 9 students (out of 13 selected by EDAG) were from our school!

## *Students Mobility*




**102 (23-24)**

## *Students Mobility*




**340 (23-24)**

# RESEARCH GROUPS



## Wide range of different engineering disciplines: 31 research groups based at EII

### Energy, Sustainability, Occupational Safety, Industrial Management

| Research Group | Code | Technical Sheet | Research Portal |
|---|---|---|---|
| ELEKTRA | RNM292 | Ficha OTRI | Portal de Investigación |
| RESEARCH GROUP IN NATURAL RESOURCES | SEJ284 | Ficha OTRI | Portal de Investigación |
| TRANSPORT AND WORK MANAGEMENT | SEJ424 | Ficha OTRI | Portal de Investigación |
| ENERGETICS | TEP139 | Ficha OTRI | Portal de Investigación |
| ELECTRIC ENERGY SYSTEM GROUP | TEP144 | Ficha OTRI | Portal de Investigación |
| WASTE TECHNOLOGY AND ENVIRONMENT | TEP184 | Ficha OTRI | Portal de Investigación |
| OPERATIONS AND SUSTAINABILITY: ICTS, QUALITY, AND OCCUPATIONAL RISK PREVENTION | TEP223 | Ficha OTRI | Portal de Investigación |
| MÁLAGA POWER ELECTRIC SYSTEM GROUP | TEP225 | Ficha OTRI | Portal de Investigación |
| ELECTRICAL ENGINEERING MÁLAGA RENEWABLE RESOURCES | TEP244 | Ficha OTRI | Portal de Investigación |
| THERMAL ENGINES AND ENERGY SUSTAINABILITY | TEP249 | Ficha OTRI | Portal de Investigación |
| THERMAL ENGINES | TEP962 | Ficha OTRI | Portal de Investigación |
| OPTIMIZATION AND ANALYTICS FOR SUSTAINABLE ENERGY SYSTEMS (OASYS) | TEP967 | Ficha OTRI | Portal de Investigación |
| OCCUPATIONAL AND ENVIRONMENTAL RISK MANAGEMENT | SEJ656 | Ficha OTRI | Portal de Investigación |

# Materials, Fluid mechanics, Manufacturing, Mechanics

| Research Group | Code | Technical Sheet | Research Portal |
|---|---|---|---|
| RHEOLOGY OF SUSPENSIONS | FQM231 | Ficha OTRI | Portal de Investigación |
| STRUCTURED FLUIDS AND AMPHIPHILIC SYSTEMS | FQM287 | Ficha OTRI | Portal de Investigación |
| MECHANICAL ENGINEERING MÁLAGA | TEP140 | Ficha OTRI | Portal de Investigación |
| FLUID MECHANICS | TEP146 | Ficha OTRI | Portal de Investigación |
| MATERIALS BEHAVIOR AND PROCESSING | TEP183 | Ficha OTRI | Portal de Investigación |
| MANUFACTURING ENGINEERING | TEP933 | Ficha OTRI | Portal de Investigación |
| ADVANCED MANUFACTURING ENGINEERING | TEP969 | Ficha OTRI | Portal de Investigación |
| FLOW CONTROL AND ITS APPLICATIONS | TEP997 | Ficha OTRI | Portal de Investigación |

# RESEARCH GROUPS



## Automation, Electronics, and Computational Systems

| Research Group | Code | Technical Sheet | Research Portal |
|---|---|---|---|
| SYSTEMS AND AUTOMATION ENGINEERING | TEP119 | Ficha OTRI | Portal de Investigación |
| MICROELECTRONICS DESIGN GROUP | TEP179 | Ficha OTRI | Portal de Investigación |
| ARCHITECTURE AND PARALLEL ALGORITHMS | TIC113 | Ficha OTRI | Portal de Investigación |
| COMPUTATIONAL TECHNIQUES IN ENGINEERING | TIC118 | Ficha OTRI | Portal de Investigación |
| INTEGRATED ELECTRONICS AND SYSTEMS DESIGN GROUP | TIC182 | Ficha OTRI | Portal de Investigación |
| ACETI GROUP | TIC201 | Ficha OTRI | Portal de Investigación |

## Industrial Engineering & Design

| Research Group | Code | Technical Sheet | Research Portal |
|---|---|---|---|
| DOMOTIC ENGINEERING, INDUSTRIAL MODELS, TECHNOLOGIES, AND ORGANIZATION | FQM385 | Ficha OTRI | Portal de Investigación |
| DESIGN OF EFFICIENT PROJECTS | TEP935 | Ficha OTRI | Portal de Investigación |
| GRAPHIC ENGINEERING AND DESIGN | TEP189 | Ficha OTRI | Portal de Investigación |
| VISUAL LANGUAGE AND APPLIED DESIGN | HUM576 | Ficha OTRI | Portal de Investigación |

# Our cutting-edge laboratories



At EII, our laboratories are more than just spaces—they are hubs of innovation, experimentation, and real-world problem solving.

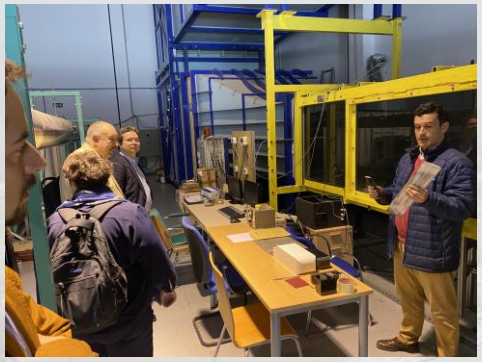
From robotics and biomechanics to fluid mechanics and vehicle dynamics, our labs support hands-on learning, advanced research, and industry collaboration.

They empower students and researchers to explore, design, and test the technologies shaping the future of engineering.

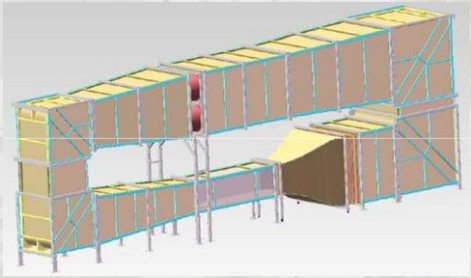
# SYSTEMS & AUTOMATION ENGINEERING (lab)

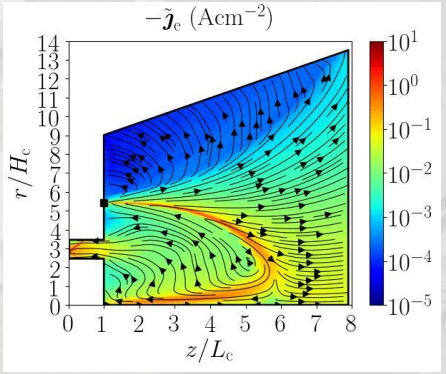
- Autonomous and teleoperated mobile robots for exploration and rescue applications
- Mobile robotics for structured environments (hospitals, museums, large buildings...)
- Robotic systems for minimally invasive surgery assistance
- Image processing (satellite-based change detection, three-dimensional maps...)
- Control systems for aerial, marine and land vehicles
- Intelligent control systems: fuzzy systems, neuronal networks, etc.
- Electric vehicles and technologies for sustainable mobility
- Automation of logistics systems and infrastructures
- Automation of manufacturing systems

## FLUID MECHANICS (lab)



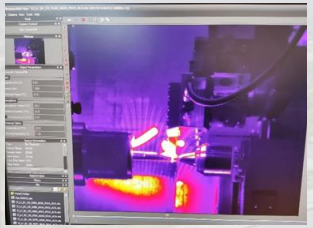
- Aero-hydrodynamics of vehicles
- Sediment transport and erosion
- Thermal energy storage systems
- Fluid dynamic and fluid-fluid interaction
- Study of marine and wind energy production systems

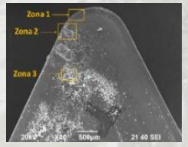


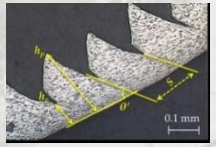


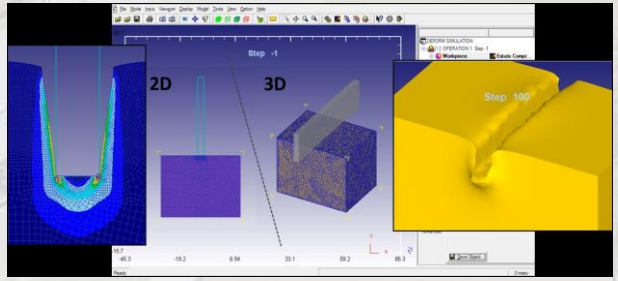

# MANUFACTURING ENGINEERING (lab)

- Analysis and optimization of machining processes
- Analysis and optimization of additive manufacturing processes
- Methods of analysis of plastic deformation processes
- Metrology
- Study of industrial heritage
- Educational innovation

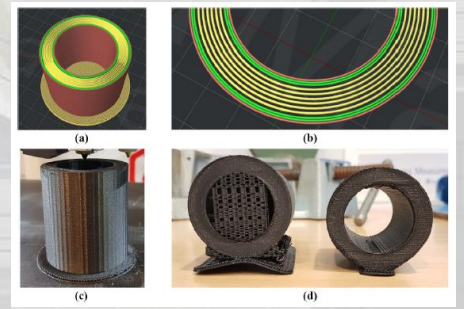







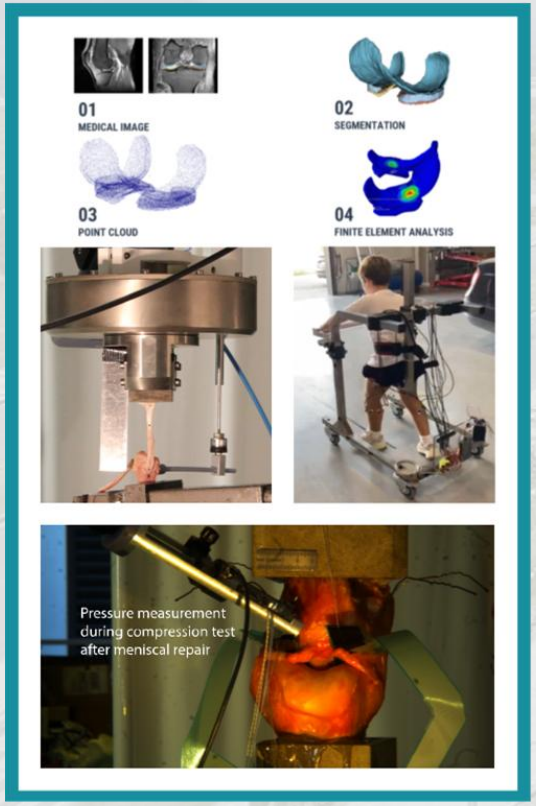








# BIOMECHANICS RESEARCH (lab)

BIOCLINA




- Kinematic and kinetic analysis of human motion
- Mechanics of hard and soft biological tissues
- Prosthetics and orthotics
- Musculoskeletal computational modeling
- Design of mobility assistive devices
- Biomechanics of human joints: knee, ankle, spine, shoulder…
- Mechanical optimization of surgical repair techniques (bone fracture fixation, spine deformity correction, meniscal repair, ligament fixation…)

# VEHICLE DYNAMICS (lab)

iMMa Ingeniería Mecánica Málaga

- Artificial intelligence applied to vehicle safety systems
- Advanced Cars & Motorcycle Modelling
- Overactuated electric vehicles
- Remote control and autonomous vehicles
- Vehicle system performance testing
- Railway vehicle dynamics, including numerical modelling and experimental validation
- Tire modelling and performance evaluation
- Advance mechanical design and prototyping

Link: Taller 31

TALLER 31

ESCUELA DE INGENIERÍAS INDUSTRIALES

UNIVERSIDAD DE MÁLAGA | ESCUELA DE INGENIERÍAS INDUSTRIALES

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