DICI was established in 2012, following a major reform of the Italian higher education system, as a merger of the former departments of:

- **Aerospace Engineering,**
- **Chemical Engineering, Industrial Chemistry and Materials Science,**
- **Mechanical, Nuclear and Production Engineering,** and a part of the department of
- **Civil Engineering.**
DEPARTMENT AT A GLANCE

- Research staff: 132
- Graduate students: 48
- Technical and administrative staff (Research support staff): 64 (11)
- Studies Programs: 14

PATENTS
- N. 10
- Arpi 02/04/2019

PUBLICATIONS
- N. 12255
- Arpi 02/04/2019

SPIN OFF
- N. 4
- Sito Unipi 02/04/2019
## Research Areas

### Aerospace
- Fatigue and damage tolerance of aerospace structures (advanced metals and composites)
- Flow stability and control, Aerodynamics of road vehicles
- Advanced chemical propulsion, Low thrust space propulsion
- Development of fly-by-wire control systems,
- Space mission analysis and space vehicle design

### Chemical
- Multiphase flow, fluid mechanics and interfacial engineering
- Materials engineering: polymers, functional materials, nanocomposites, metals, biomedicals
- Product design: membranes, electrodes, fuel cells; Fuel technology and carbon capture
- Chemical process design, control, intensification, modelling
- Manufacturing planning, systems and optimization
- Industrial safety & Environmental protection (wastewater - waste management)

### Civil
- Traditional and innovative materials for structural engineering (masonry, wood, reinforced concrete, steel, glass, fibre-reinforced composites, etc.); Classical linear and non-linear elasticity; Damage mechanics, Fracture mechanics and Fatigue; Road and runway materials, pavement and subgrade design, monitoring and evaluation, Geomatic and soil/foundation engineering; Earthquake engineering and Structural dynamics; Fire and explosion resistance of structures; Structural design of bridges, buildings, industrial plants, and innovative elements; Traffic management: advanced methods for roundabout design and flow simulation, Road safety and mitigation of road traffic noise, Mathematical models for transport demand and network analysis; Freight logistics and port planning

### Mechanical
- Mechanics of Materials and components: modelling, testing and computational analyses (fatigue, fracture, creep, wear, residual stress)
- Hydrogen Embrittlement; Surface mechanics and Tribology
- Acoustic and Bioacoustic: noise analysis and modelling; Mechatronics and Robotics
- Computational and Experimental Biomechanics and Biotribology
- Dynamics and design of Vehicles, transmissions, structural and rotor dynamics
- Laser Applications for Manufacturing

### Nuclear
- Thermal hydraulics of innovative nuclear systems;
- Thermal mechanical behaviour of breeder materials for nuclear fusion reactors
- Dosimetry and image quality in radiodiagnostic; Environmental and personnel neutron and gamma dosimetry
- Design and licensing of casks for storage and transport of radioactive materials; Qualification tests of noble radioactive gases delay beds with activated carbon
- Nuclear Reactor Safety;
RESEARCH PROJECTS

Research Projects FP7 & H2020 Financed

- NARSIS
- SESAME
- MYRTE
- ENEN PLUS
- EURO-FUSION
- HYSEA
- NANO-CATHEDRAL
- ENDURANCE
- PARSIFAL
- GRISPE PLUS
- GTFTR
- REG CAM 2018
- RESOLVE
- DESDEMONA
- DISSIPABLE
- EVOLUTION
- FLEXI TURBINE
- STEELWAR
- FASTCOLD
- UMI-SCI-ED
- POLYBIO SKIN
- INNOSEIS
- LASTEICON

PILLARS & CROSS-CUTTING INITIATIVES OF FINANCED FP7 & H2020

- Science with and for society
- Leadership enabling and industrial technology
- Fuel cell and hydrogen
- Smart, Green and integrated transport
- Bio-based Industries joint Undertaking
- Secure Clean & Efficient Energy
- Research Fund for Coal and Steel

CIVIL AND INDUSTRIAL ENGINEERING
RESEARCH IMPACT

Local

- Patents are used by local companies
- Enabling and strengthening industrial technologies (in the field of materials, energy system, fuels and transport)

Regional

- Strengthen Europe's industrial capacities and business perspectives, including SMEs
- Promoting innovation-driven growth and employment
- Beneficial applications of new process and application in the industrial sectors