University of Ferrara

In 1391, a century before Columbus discovered America, **Ferrara** already had its university, with courses in Arts, Theology and Law. Today, after more than six centuries, the university where Copernicus and Paracelsus studied is the only campus in the world enclosed by nine kilometers of medieval walls.
The **Department of Chemical, Pharmaceutical and Agricultural Sciences** hosts 63 teachers, 11 people in technical roles and 3 researchers from the National Research Council, ISOF institute.
The main sectors in which researchers from the department are involved concern:
Analytical and Environmental Chemistry
Physical and Computational Chemistry
Inorganic Chemistry and Photochemistry
Organic chemistry
Industrial chemistry
Nutraceutical-Food Chemistry
Pharmaceutical Chemistry
Pharmaceutical Technology
Biochemistry and Microbiology
Ecology
Sustainable management of agrosystems
Research activities are developed both in the context of public funding and in collaboration with national and foreign private companies.

*Offered services*
1. Impacts in the aquatic environment (from point sources: monitoring from reclamation, accidental and/or process spills, etc.). Evaluation of the environmental state (from diffuse sources: monitoring of water bodies) and monitoring of the marine and lagoon environment for the evaluation of the levels of pollutants/micropollutants in biotic and abiotic samples
2. Development of monitoring systems for the aquatic environment.
3. Application and implementation of biological quality element analysis methods for the classification of the ecological state of aquatic ecosystems. Development and application of biological and ecosystem indicators.
4. Analysis of the effects associated with climate change; application of innovative technologies for marine-coastal and lagoon environmental mitigation (GHG capture/storage, bioremediation, carbon footprint).
5. Environmental studies, development and application of improving technologies relating to shellfish farming.
6. Valorisation of waste from aquaculture and fishing.
7. Digitalization in aquaculture, development and use of sensor networks for real-time monitoring of environmental parameters.

8. Product certification: sampling, chemical, bromatological, microbiological analyses, data analysis and preparation of documentation.
9. Labeling of aquaculture products
10. Analysis of sediments: composition, organic and inorganic micropollutants
11. R&D on issues relating to ecological restoration, mitigation, fisheries production, antifouling, in the marine and lagoon environment.
12. R&D on issues relating to the chemistry of natural substances, drugs and cosmeceutical products, and food products
The Department hosts cutting-edge instrumentation, including liquid-phase and gas-phase chromatographic instrumentation interfaced with mass spectrometry, atomic spectroscopy with different atomization sources and mass spectrometry with various ionization modes, NMR spectrometry; EPR spectrometry; a high-performance computing center; SEM microscopy; XRD (single crystal and powder) diffractometers, AFM/STM atomic force microscopy and transient absorption laser spectrometry with femtosecond and nanosecond time resolution, as well as many fully equipped laboratories for synthesis, including automated synthesis platforms, and characterization chemistry of compounds and/or products of different nature. Optical microscopes and stereoscopes. Equipment for the biological sampling of benthos and plankton, and microplastics.

**The Electron Microscopy Center** provides cutting-edge scientific instrumentation and highly specialized personnel to provide the specific technical skills of the various application fields for the preparation and observation of samples in electron and atomic force microscopy. The applications cover the most diverse fields of interest such as animal and plant biology, materials science, geochemical and micropalaeontology, cultural heritage and environmental issues.
Instruments:
**FEG SEM Zeiss Gemini 460**
**SEM Zeiss EVO 40**

**TEM Thermo Fisher Talos L120C G2**
**TEM Zeiss EM 910**


**Cytoviva hyperspectral microscope**