

# Agropolis International training and education

## *in the area of green technologies*

**A**gropolis International, through its member institutions (universities, engineering schools and specialized training institutions) offers comprehensive training, covering

more than 80 diploma courses (from Bac+2 to Bac+8: technician, engineer, licence, master's, specialized master's, PhD...) as well as some one hundred training modules (existing or custom).

The tables below detail the training given in the area of green technologies. They specify the degree levels, course titles and institutes responsible.

### Degree courses entirely focused on the theme of “green technologies”

Level	Degree	Training	Institution(s)
Bac +5	<i>Ingénieur Engineering</i>	Agronomy engineer—specialization “Chemistry and bioprocesses for sustainable development (green chemistry, sustainable chemistry)”	Montpellier SupAgro, ENSC.M
Bac +3	<i>Licence professionnelle BSc with professional scope</i>	Chemical analysis applied to the environment	UM2
		Green technologies for remediation	UPVD
		Maintenance applied to the treatment of pollution	UPVD
		Disciplines involved in environmental risks and impacts	Univ. Nîmes
Bac +2	<i>DUT (University Diploma of technology)</i>	Biological Engineering, specialization “environmental engineering”	UPVD
		Chemical engineering, process engineering, specialization “bioprocesses”	UPVD

### Degree programmes focused on other topics including significant components relating to the theme of “green technologies”

Level	Degree	Training	Institution(s)
Bac +8	<i>Doctorat (PhD)</i>	Process Sciences, Food Sciences (ED 306 SPSA)	Montpellier SupAgro, UM1, UM2, Univ. Avignon
Bac +5	<i>Ingénieur Engineering</i>	Agronomy engineer—specialization “Management of water, cultivated lands and the environment”	Montpellier SupAgro
		Polytech Engineer—Water sciences and technologies	UM2
	<i>Master (MSc)</i>	Biology of plants and microorganisms, biotechnology, bioprocesses, specialization “Food and Environment Bio-engineering” specialization “Agri-food and Environmental Science and Processes” curriculum	Montpellier SupAgro, UM2
		Water, specialization “Water and Agriculture”	AgroParisTech, Montpellier SupAgro, UM2

### Short courses

Institution(s)	Training
Montpellier SupAgro	Environmental Life Cycle Analysis (LCA) (3 days)
	Re-use of wastewater for irrigation (2 days)
CIRAD	Agricultural and environmental impact of organic matter management. Application to the South (5 days)

# ChemSuD

## European Chair of New Chemistry for Sustainable Development



The European Chair of New Chemistry for Sustainable Development (ChemSuD) is located at the *École Nationale Supérieure de Chimie Montpellier* (ENSC.M). It was created with the support of CNRS and the Languedoc-Roussillon Region and under the patronage of the French Academy of Technologies.

The ChemSuD Chair is a locus of exchange, meetings, education and research for the emergence and development of a new chemistry that can effect the harmonious co-evolution of the human species and the planet. It has a corporate foundation, the ChemSuD Foundation, with the following founding members: Arkema, BASF, Colas, Firstsolar, Solvay and Tecsol.

The actions of the ChemSuD chair are threefold:

■ **Teaching:** through academic education and continuing training, to train responsible chemists, active in sustainable development and eco-design, ChemSuD develops educational content and organizes courses, seminars and conferences for

the students and researchers involved, including those working in social sciences and the humanities, in an exemplary spirit of openness to the European space.

■ **Research,** to meet sustainable development criteria, generate innovation and stimulate business development in support of the laboratories of the Carnot Institute on Chemistry, Environment and Sustainable Development (CED2) and the Balard cluster. ChemSuD is thus working to promote research and development in chemistry in accordance with sustainable development criteria and the new regulations. This research relates to chemical products and processes but also to chemistry's contributions to various human activities (energy, housing, transport, agriculture, health, etc.), in close collaboration with the companies concerned.

■ **Scientific mediation,** to educate the public about this new chemistry through lectures, discussions and appropriate publications.

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For further information: [www.ChemSuD.fr](http://www.ChemSuD.fr) ou [www.enscm.fr/ChemSuD](http://www.enscm.fr/ChemSuD)

## Engineering, specialization “Chemistry and Bioprocesses for Sustainable Development”



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This training, a joint undertaking of Montpellier SupAgro and the *École Nationale Supérieure de Chimie* in Montpellier (ENSCM) begun in 2008, is offered to engineering students of both schools. Its objective is to provide students with the scientific knowledge and methodological tools they need to achieve a thorough grasp of the field of sustainable production of biomolecules, materials and fuels from agricultural raw materials (green chemistry).

The courses include: raw materials production and quality control; biological, physical and chemical processing technologies; tools to study industries' environmental impact; a socio-economic analysis of their sustainability; and the regulatory framework to which they are subject.

This comprehensive approach is required to develop sustainable innovation strategies.

Hence, the courses are built around four main subjects:

- upstream: control of the properties of agricultural raw materials and their sustainable production;
- core subject, biorefining: fractionation, microbial and enzymatic bioconversion, clean chemistry, mining, water and energy management;
- downstream: products and application areas;
- in a global approach, socio-economic integration and sectoral sustainability: markets, institutional policies, public and industrial strategies, environmental assessment, production management, management, regulation.

The training consists of six months of courses (September to March) based on case studies and visits and involving many professional stakeholders, together with an engineering internship (March to September) in France or abroad.

This training will equip engineers to work in any of the aspects of the production chain with an awareness of how their work fits into the global issues and to work closely with different units (R&D, procurement, production, marketing, commercialization...) in the agribusiness, chemicals, pharmaceuticals and cosmetics sectors, to name a few... They may also work for eco-assessment and industrial ecology consultancy firms and services, organizations that set orientation or incentive policies at the regional, national or international level, or research organizations.

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