

INTERNATIONAL MASTER'S PROGRAM

BI TECH ECO

Industrial BioTechnology
for a Bio-Based Economy

BIOECONOMY

Bioeconomy was first defined in 2012 as the production of renewable biological resources and the conversion of these resources and waste streams into value-added products, such as food, feed based products and bioenergy [European Commission: Innovating for Sustainable Growth, 2012]. Current global challenges like climate change and land and ecosystem degradation have broadened these objectives, highlighting the urgent need to develop a sustainable and circular bioeconomy leading to the modernization and renewal of traditional industries. This strategy must reinforce the bio-based sector and create new jobs, particularly at the local level [European Commission's Updated Bioeconomy Strategy 2018].

Bioeconomy is therefore an opportunity to rethink our economic and societal lifestyle, creating new emerging segments of activities, and turning this new economic paradigm into a sustainable provider of employment. This formidable challenge requires reshaping our current Education, Research and Innovation methods toward a systemic integration of all the components of the supply-value chain, from pretreatment of resources to final products, including environmental, societal and ethical aspects.

BIOTECHECO OBJECTIVES

The international master's program focuses on Industrial Biotechnology and Processes for Bioeconomy and encompasses the integrated learning in life sciences, chemical engineering, bioprocess engineering, sustainability, environmental regulations and economics, bioethical issues. The attractiveness of this educational program lies in producing graduate students with cross-disciplinary skills and expertise. The added value and originality of BioTechEco stem from the integration of the master's program in a Graduate School of Research in BIOTECHNOLOGY FOR BUILDING A BIO-BASED ECONOMY.

The close ties of the degree with a doctoral program and international scientific competitions will ensure its relevance to research and education centers in Toulouse with innovative pedagogical practices. A coupled training delivered by both University Faculties and Research Units in Biological and Chemical Sciences and Economics will provide new and unique expertise to students, making them attractive to the emerging bioeconomy market and allowing them to develop new industrial segments.



MASTER'S PROGRAM

PROGRAM	ECTS
SEMESTER 1: AT THE UNIVERSITY OF TOULOUSE This semester represents 500 hours of courses: 250 hours of lectures/tutorials & 250 hours of practice	30
Integration package (French language and culture)	
System biology I, Synthetic biology and Enzyme systems I	6
Biochemical engineering I and Upstream and downstream bioprocessing I	5
Ethical issues I and Bioeconomy I	4
Practical training in research laboratories	15
M1 - SEMESTER 2: ABROAD AT SELECT PARTNER UNIVERSITIES	30
System biology II, Microbial systems and Upstream and downstream bioprocessing II	5
Bioeconomy II	25
M2 - SEMESTER 3: AT THE UNIVERSITY OF TOULOUSE	30
Life cycle assessment and Ethical issues II	5
Biochemical engineering II and Enzyme systems II	5
Entrepreneurial skills and leadership	2
Bioprocess design and Project management	8
Practical courses	10
M2 - SEMESTER 4: AT THE UNIVERSITY OF TOULOUSE OR ABROAD	30
6-month in an industrial company or in a laboratory research team from the university consortium involved in this program	30

Assessments comprise course examinations, written laboratory reports, work groups and presentation depending on the module.

BIOECONOMIC CHALLENGES

- Reduce environmental impact
- Develop renewable alternatives to fossil resources
- Create 1 million new green jobs by 2030

FURTHER INFORMATION

- Bioeconomy in 2030: designing a policy agenda: <http://www.oecd.org/futures/long-termtechnologicalsocietalchallenges/thebioeconomyto2030designingapolicyagenda.htm>
- Bioeconomy: a new strategy for a sustainable Europe: <https://ec.europa.eu/research/bioeconomy/index.cfm>

WHY APPLY TO BIOTECHECO

- Teaching delivered by lecturers and researchers from universities ranked among the 300 best institutions [NTU and ARWU rankings].
- Bright international career prospects specialized in the emerging field of a sustainable bio-based economy, a growing sector offering new jobs in green chemistry, health, bioenergy, water and wastes treatment, biomaterials, cosmetics, among many others.

HOW TO APPLY TO BIOTECHECO

CANDIDATES

- French, European or International bachelor's degree in biological sciences, biotechnology or chemical engineering.
- Pre-sessional courses in biological sciences and/or process engineering are organized prior to the start of the master's degree to meet requirements in both specialties if needed.

APPLICATION AND ADMISSION PROCESS

A two steps admission process:

- 1. Online application process:
<https://e-candidat.insa-toulouse.fr>
(until April 15)
- 2. Interview with pre-selected candidates based on their suitability (planned for mid-May)

FEES

- Tuition fees from 243 € to 3770 € depending on EU or NonEU/EEA citizenship
- Specific cost: 5139 €
- Fellowships can be provided on the basis of academic merit and financial needs

CONTACTS

For all inquiries, please email :
biotecheco-contact@insa-toulouse.fr



"This master's program is included in EUR BIOECO supported by the French State and managed by The French National Research Agency (ANR) under the Investments for the Future program (PIA) ANR-18-EURE-0021."

ORGANIZATION

BioTechEco is a two-year full-time master's program consisting of 120 ECTS, entirely taught in English and designed for international and French university students.

The program offers high-quality teaching from renowned professors, a truly multicultural work environment with students coming from all over the world, and genuine experiences within the research and industrial worlds.