Master's Degree
(Year 2)

BioSpace-Xpert



université de BORDEAUX



What is space biology and the biology of extreme environments?

This field studies the effects of extreme environments, such as microgravity, isolation, radiation, and extreme temperatures or pressures on living organisms. It explores the mechanisms by which humans and other forms of life adapt, with the aim of developing innovative solutions for space exploration and for operating in constrained environments on Earth.

Programme objectives

The BioSpace-Xpert programme trains specialists to understand and analyse the effects of extreme environments, both in space and on Earth, on living organisms. It is designed for students and professionals from health sciences, biology, engineering, and sports science, and prepares graduates for careers in research, space exploration, health, performance, scientific and technological innovation, and science communication.

Applicants must hold one of the following

- a Master's Year 1 (M1) in human, animal or plant biology ;
- an equivalent qualification in health-related fields (e.g. pharmacy, medicine, dentistry) or in Sports Science;
- an engineering or veterinary degree in a related field.

The Master's programme is also open to individuals returning to education through continuing education, with the possibility of recognition of prior learning (RPL). International applicants are also welcome to apply.

Course content

Semester 1

- From Earth to Space and back
- Radiobiology/ Mechanosensitivity
- Human physiology adaptation to space and extreme environment
- Human Brain in Space and extreme environment
- Life support and countermeasures
- Strategies to perform an experiment in space or in altered gravity
- Project design
- Mini project (experimental works)
- Entrepreneurship

Semester 2

- Opening module or Ethics (Ethics is mandatory if not previously validated)
- Internship

Courses are delivered in both English and French and totally in English from 2027.

Student support

Academic support and preparation for career integration.

Financial support for internships (subject to eligibility criteria) and assistance with finding internship placements.

Programme strengths

The BioSpace-Xpert programme offers a hands-on approach combining theoretical teaching with practical application. Visits to research and experimental facilities enhance experiential learning. Courses are delivered by leading experts from research laboratories, agencies, and specialized organisations. With a strong international dimension, the programme covers both space environments and extreme environments on Earth.

Partnerships

Université Aix-Marseille, Université Clermont-Auvergne, Université Bourgogne Europe, Université Caen Normandie, Université de Lorraine, Université Paris Cité, Université de Montpellier, Université de Toulouse, Université Rennes 2, Université Jean Monnet Saint-Étienne, Sorbonne Université, Way4Space, Université Paris Saclay, Ethospace, Ifremer, MEDES, CNRS

What next?

Career opportunities

Graduates may work in:

- Space and biotechnology companies using microgravity for R&D and life-support systems in extreme environments
- Space agencies (e.g. CNES, ESA)
- Education and research
- Museums and science communication organisations
- Sports performance and physiology
- Healthcare and prevention sectors

Typical roles include

Space biologist, physiologist, neuroscientist, physician specialised in space medicine, engineer (biomedical, life-support systems, materials, biotechnology), biomedical data scientist, laboratory technician (space/bioanalysis), scientific mission specialist, researcher, etc.

Further studies

PhD programmes

Professional development

- Supervised research project
- Mandatory 5-month internship (700 hours)
- Entrepreneurship course
- Professional site visits





Training program identity card

Admission requirements

› Applicants must hold one of the following :
  - a Master's Year 1 (M1) in human, animal or plant biology ;
  - an equivalent qualification in health-related fields (e.g. pharmacy, medicine, dentistry) or in Sports Science;
  - an engineering or veterinary degree in a related field.

› The Master's programme is also open to individuals returning to education through continuing education, with the possibility of recognition of prior learning (RPL). International applicants are also welcome to apply.

› If you do not hold the required qualification for admission and wish to have your professional and personal experience considered, please contact:

› Phone: +33 (0)5 57 57 92 28
+33 (0)5 57 57 14 02

Duration and pace of the programme

› The programme lasts one year and is divided into two semesters. The second semester is dedicated to an internship in a laboratory or a company, in France or abroad.

Workload

› 350 hours of coursework in Semester 1 and 700 hours of internship in Semester 2.

Programme structure

› This programme builds on Bordeaux's particularly dynamic research ecosystem, as well as on the full network of French research teams in the field of human space exploration, recognized by the French National Centre for Space Studies (CNES), and supported by industry partners. It provides students with fundamental knowledge of the mechanisms and strategies by which living organisms (human, animal and plant) adapt to extreme environments, while fostering an experimental and innovative approach to life-support systems and associated countermeasures.

Teaching methods

› Lectures, practical sessions, and research projects.

Assessment methods

› Final examinations (written and/or oral) and internship thesis defences.

Location of the programme

› Most courses will be delivered either online or in Bordeaux by the 13 partner universities of the CMA CAP BIOSPACE programme.

International dimension

› During the second semester, students may complete their internship abroad. International partnerships are in place to facilitate connections between students and host institutions.

Specific arrangements

› The BioSpace-Xpert Master's degree is open to both initial training (following a Master's Year 1) and continuing education (for returning learners).

Number of places

› 10 for the 2026 intake

Practical information

Location of the programme

Campus Carreire
146 rue Léo Saignat
33000 Bordeaux.

Application procedures

› Initial training (after completion of a Master's Year 1) and continuing education (for returning learners): via the eCandidat platform.

Contacts

Academic coordinators

› Alice Nicole
alice.nicole@u-bordeaux.fr

› Jean-François Quignard
jean-francois.quignard@u-bordeaux.fr

Deputy coordinators

› Gaëlle Quarck and Jean-Pol Frippiat

Registrar's office for initial training (after M1): Applications via the eCandidat platform

› scolarite.lmd.medecine@u-bordeaux.f

Continuing education (for professionnals, returning learners)

For information on tuition fees and available funding opportunities, please contact the Continuing Education Unit in Health:

› Phone: +33 (0)5 57 57 92 28
+33 (0)5 57 57 14 02

› formation.continuesante@u-bordeaux.fr

Recognition of prior learning (RPL)

If you do not hold the required qualification for admission and wish to have your professional and personal experience considered, please contact:

› Phone: +33 (0)5 57 57 92 28
+33 (0)5 57 57 14 02

International students

International applicants must have completed at least 240 ECTS credits or four years of higher education to be eligible. Applications submitted through the "Études en France" procedure will not be accepted on the eCandidat platform.

Find out more

u-bordeaux.fr/formation

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