

✓ Second Cycle Specializations

The second cycle at ESSBO is a three-year engineering program leading to a State Engineer degree in Biological Sciences or Biotechnology. It is structured around a shared scientific foundation and four specializations:

Molecular Biology focuses on DNA, RNA, proteins, genomics, molecular diagnostics, genetic engineering, bioinformatics and molecular biotechnology. It prepares students for research, diagnostics, genomic analysis and advanced biology applications.

Enzyme Engineering focuses on enzymes, biocatalysis, bioprocesses, applied biotechnology, industrial microbiology, quality control and biological process optimization. It prepares students for careers in biotechnology, agri-food, pharmaceutical, environmental and industrial sectors.

Immunotechnology provides advanced training in immunology and its technological applications, including immunoassays, antibody-based technologies, immunodiagnostics, biomedical analysis and biotechnological innovation.

Forensic Biology applies biological sciences to forensic and legal contexts. It includes biological trace analysis, DNA profiling, serology, genetic identification and the scientific interpretation of biological evidence.

Together, these programs strengthen students' scientific expertise while developing practical skills, professional rigor, innovation capacity and project management abilities.

✓ Presentation of ESSBO

The Higher School of Biological Sciences of Oran is a public higher education institution dedicated to training highly qualified State Engineers in biological sciences and biotechnology. Established following the transformation of the Preparatory School of Nature and Life Sciences by Executive Decree No. 17-304 of 22 October 2017, ESSBO provides rigorous academic, practical and innovation-oriented training.

The school combines theoretical courses, laboratory practice, technical workshops, internships, project-based learning and support for entrepreneurship and technology transfer. Its mission is to prepare students for scientific, industrial, entrepreneurial and societal challenges in modern biological sciences.

✓ Preparatory Classes

The preparatory classes at ESSBO form a two-year multidisciplinary program designed to provide students with a solid foundation in biological sciences and related disciplines.

Students receive training in biology, chemistry, physics, mathematics, computer science, communication techniques, scientific methodology and laboratory practice. This cycle develops scientific reasoning, analytical skills, experimental rigor, teamwork and written and oral communication.

At the end of the preparatory cycle, students are progressively oriented toward the engineering cycle, where they specialize in one of ESSBO's advanced biological science fields.



ÉCOLE SUPÉRIEURE EN SCIENCES
BIOLOGIQUES D'ORAN

Higher School of Biological Sciences of Oran

A Gateway to Excellence in Biotechnology
and Biological Sciences...



Employability

Graduates of ESSBO have access to numerous career opportunities in biological sciences, biotechnology and innovation. Here are some examples:

✔ **Entrepreneurship:** They can establish innovative ventures in biotechnology, agri-food, biomedicine, environmental sciences and industry, by transforming their scientific expertise into useful products, services or technological solutions.

✔ **Laboratory Analysis Engineer:** Graduates can work in medical, molecular, microbiological, immunological, environmental, agri-food, industrial and forensic laboratories. They are trained to conduct analyses, implement experimental methods, interpret results, contribute to research activities and ensure quality control.

✔ **Biotechnology and Industrial Applications:** They may contribute to bioprocesses, enzyme-based technologies, molecular diagnostics, biotechnology production, biological quality assurance, bioinformatics and applied biological innovation.

✔ **Teaching and Research:** Graduates may pursue doctoral studies and academic careers as researchers or teacher-researchers in higher education institutions, research centers and specialized laboratories.

✔ **Innovation and Technology Transfer:** Through ESSBO's innovation ecosystem, graduates may develop startups, patent-oriented projects, biotechnology-based ventures or contribute to the valorization of research results and technology transfer.



What degree will be obtained at ESSBO?

At ESSBO, students complete a five-year curriculum leading to a **State Engineer degree** in Biological Sciences or Biotechnology. The training pathway includes a two-year preparatory cycle followed by a three-year engineering cycle in one of four specializations: Molecular Biology, Enzyme Engineering, Immunotechnology or Forensic Biology.

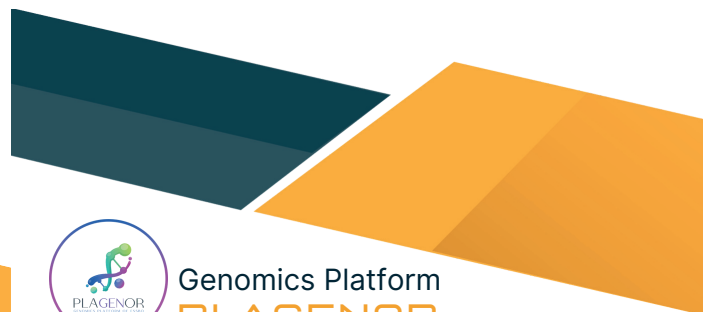
Within the framework of national innovation initiatives, particularly Ministerial Order No. 1275 of 27 September 2022, as amended and supplemented by Ministerial Order No. 008 of 23 February 2025, students may develop innovative final-year projects under the "One Degree, One Startup" or "One Degree, One Patent" mechanism. This pathway encourages students to transform scientific knowledge into practical solutions, promote entrepreneurship, protect innovative ideas and strengthen the link between academic training, research valorization and socio-economic needs.



Scientific Club

The ESSBO Scientific Club, **CREATIVE Minds**, is a student community dedicated to scientific culture, creativity and innovation. Through workshops, scientific events, awareness campaigns and online activities, the club encourages students to communicate science, exchange ideas, develop teamwork skills and participate actively in the scientific life of the school.

Facebook: @Club.scientifique.ESSBO



Genomics Platform PLAGENOR

The Genomics Technology Platform – PLAGENOR – is a common research service platform dedicated to molecular biology, genomics and applied biotechnology. Registered on the national IBTIKAR-DGRSDT platform, PLAGENOR provides Algerian doctoral candidates, students, researchers and institutional partners with access to specialized equipment, technical expertise, genomic workflows and bioinformatics-supported data interpretation. As a shared scientific infrastructure, the platform supports advanced research, hands-on training, doctoral projects, collaborative studies and technology transfer in genomic sciences.



ESSBO Incubator

Established to support student innovation, the ESSBO Incubator accompanies students in transforming scientific ideas into structured projects, prototypes, startups or patent-oriented initiatives. It provides training, mentoring, project guidance, entrepreneurial support and collaborative spaces. The incubator helps students identify relevant problems, design innovative solutions, develop project models and prepare their ideas for scientific, economic or societal valorization.



CDE — Entrepreneurship Development Center

The Entrepreneurship Development Center supports the development of entrepreneurial culture among ESSBO students. Through workshops, training sessions, mentoring and awareness activities, students acquire the knowledge and skills required to design and develop innovative projects or small businesses. The center also helps connect students with national support mechanisms, funding opportunities and technical guidance. Its role is to prepare students not only as future engineers, but also as project leaders capable of contributing to the knowledge-based economy.



CATI — Technology and Innovation Support Center

The Technology and Innovation Support Center supports students, researchers, laboratories and socio-economic partners in transforming ideas and research results into useful and sustainable innovations. CATI promotes intellectual property awareness, patents, trademarks, technological watch, prior-art searches, project maturation, technology transfer and university-industry partnerships. It also supports training activities, innovation workshops, research valorization and collaboration with economic and institutional partners. Through CATI, ESSBO strengthens the link between academic research, innovation, entrepreneurship and socio-economic development.



ESSBO AI Center

The ESSBO Artificial Intelligence Center promotes the use of artificial intelligence in biological sciences. It supports students and researchers through training, mentoring, AI tools and interdisciplinary project development. Its activities contribute to bioinformatics, biological data analysis, genomics, diagnostics, modelling, environmental biology, biotechnology and decision-support applications. The center helps prepare students for the digital transformation of biological sciences and supports innovative projects at the interface between biology, data science and artificial intelligence.

Contacts

BP 1042 Saim Mohamed, Cité Emir Abdelkader,
Ex-INESSMO, 31000 Oran, Algeria

+213 41 24 63 59

www.essb-oran.edu.dz

contact@essb-oran.edu.dz

Incubator: essbo.incubator@essb-oran.edu.dz

EDC: www.essb-oran.edu.dz

CATI: essbo.cati@essb-oran.edu.dz

AI Center: ai.lab@essb-oran.edu.dz

PLAGENOR: genomicsplatform.essbo@gmail.com



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