

BIOTECHNOLOGY STUDY PLAN

FIRST YEAR 60 ECTS

Annual

- Basic Biochemistry Methodology (9 ECTS)
- Physics (EFC) (9 ECTS)

1st semester (Sep-Jan)

- Biochemistry I (6 ECTS)
- Cell Biology (6 ECTS)
- Chemistry (6 ECTS)
- Mathematics (6 ECTS)

2nd semester (Jan-Jun)

- **Basics of Chemical Engineering and Biotechnology (ENG) (6 ECTS)**
 - Biochemistry II (6 ECTS)
 - Biostatistics (6 ECTS)
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SECOND YEAR 60 ECTS

1st semester (Sep-Jan)

- Fluid Mechanics (ENG) (6 ECTS)
- Genetics (6 ECTS)
- Microbiology (6 ECTS)
- Regulation and Biosynthesis of Macromolecules (6 ECTS)
- Thermodynamic and Chemical kinetics (6 ECTS)

2nd semester (Jan-Jun)

- Cell and Tissue Cultures (EFC) (6 ECTS)
 - Immunology (6 ECTS)
 - Instrumental Techniques (6 ECTS)
 - Microorganisms and Industrial Production (6 ECTS)
 - Molecular Biology and Genetic Engineering (6 ECTS)
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THIRD YEAR 60 ECTS

1st semester (Sep-Jan)

- Animal Physiology (ENG) (6 ECTS)
- Chemical Reactor Design (ENG) (6 ECTS)
- Mass Transfer (ENG) (6 ECTS)
- Methods in Genetic Engineering (6 ECTS)
- Plant Metabolism and Physiology (6 ECTS)

2nd semester (Jan-Jun)

- Biocatalysis (6 ECTS)
 - Integrated Laboratory in Biotechnology (6 ECTS)
 - Law and Ethics in Biosciences (6 ECTS)
 - **Mathematical Modeling (EFC) (6 ECTS)**
 - **Processes of Separation (ENG) (6 ECTS)**
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FOURTH YEAR 60 ECTS

1st semester (Sep-Jan)

- General Economy and Business Organisation (6 ECTS)

2nd semester (Jan-Jun)

- Processes and Products in Biotechnology (6 ECTS)

Optional courses

- Environmental Biotechnology (ENG) (4,5 ECTS)
- Extension of Molecular Biology (EFC) (4,5 ECTS)
- Microbial Physiology (4,5 ECTS)
- Nanobiotechnology (EFC) (4,5 ECTS)
- Quality Management (EFC) (4,5 ECTS)
- Risk and Safety Analysis in Industrial Plants (EFC) (4,5 ECTS)
- Systems Biology (ENG) (4,5 ECTS)
- Virology (4,5 ECTS)
- Scientific and Technical writing skills in Basque (6 ECTS)

Optional courses

- Genomics (4,5 ECTS)
- Microbial Biotechnology (4,5 ECTS)
- Organic Synthesis in Biosciences (4,5 ECTS)
- Plant Biotechnology (4,5 ECTS)
- Tissue Engineering (4,5 ECTS)
- Scientific and Technical oral skills in Basque (6 ECTS)

FINAL YEAR PROJECT (ENG) (12 ECTS)

ENG: Courses taught in English

EFC: English Friendly Courses, taught in Spanish or in Basque, but support, tutorials and student reporting and exams in English.
