



UNIVERSIDAD  
COMPLUTENSE  
MADRID



Bachelor's Degree  
Sciences

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Biochemistry Degree

# Syllabus

| Course Type                     | ECTS       |
|---------------------------------|------------|
| Compulsory Core Courses         | 60         |
| Compulsory Courses              | 132        |
| Elective Courses                | 30         |
| Bachelor's Degree Final Project | 18         |
| <b>TOTAL</b>                    | <b>240</b> |

| First Year                           | ECTS |
|--------------------------------------|------|
| Biology                              | 12   |
| General Biochemistry                 | 6    |
| Statistics and Calculus              | 6    |
| Physics for Biosciences              | 6    |
| General Biology Laboratory           | 6    |
| General Chemistry Laboratory         | 6    |
| Chemistry                            | 12   |
| Techniques of Biochemical Analysis I | 6    |

| Second Year   | ECTS |
|---|------|
| Biosynthesis of Macromolecules                      | 6    |
| Enzymology  | 6    |
| Structure of Biological Membranes                   | 6    |
| Protein and Nucleic Acid Structure                  | 9    |
| Laboratory of Biochemistry and Molecular Biology I  | 9    |
| Laboratory of Biochemistry and Molecular Biology II | 6    |
| Regulation of Metabolism                            | 6    |
| Cell Signalling                                     | 6    |
| Techniques of Biochemical Analysis II               | 6    |

| Third Year                                       | ECTS |
|--|------|
| Clinical Biochemistry                            | 6    |
| Fundamentals of Bioreactors Design               | 6    |
| Fundamentals of Biochemical Engineering          | 6    |
| Genetic Engineering                              | 6    |
| Immunology                                       | 6    |
| Integrated Laboratory of Biomedical Applications | 6    |
| Integrated Laboratory of Biotechnology           | 6    |
| Clinical Microbiology, Parasitology and Virology | 6    |
| Molecular Pathology                              | 6    |
| Biotechnological Processes                       | 6    |

| Fourth Year  | ECTS |
|--|------|
| Biophysics and Bioinformatics                          | 6    |
| Integrated Laboratory of Biophysics and Bioinformatics | 6    |
| Five Elective Courses                                  | 30   |
| Bachelor's Degree Final Project                        | 18   |

| Elective Courses                                     | ECTS |
|--|------|
| Environmental Biochemistry                           | 6    |
| Developmental Biochemistry                           | 6    |
| Pharmacological and Toxicological Biochemistry       | 6    |
| Food Biotechnology                                   | 6    |
| Environmental Biotechnology                          | 6    |
| Clinical and Pharmaceutical Biotechnology            | 6    |
| Plant Biotechnology                                  | 6    |
| History of Biochemistry                              | 6    |
| Applied Immunology                                   | 6    |
| Industrial Microbiology                              | 6    |
| Neurochemistry                                       | 6    |
| Current Topics of Biochemistry and Molecular Biology | 6    |

| Participation Credits | ECTS |
|-----------------------|------|
| Any course            | 6    |



## Knowledge acquired

- Concepts and principles of Biochemistry.
- Physical principles involved in a biological process.
- Chemical transformations involved in a biological process.
- Molecular mechanisms of metabolism.
- Transmission of genetic information at molecular and cellular level.
- Molecular basis of pathologies.
- Biochemical experimental methodology.
- Handling of chemical and biological materials in a laboratory.
- Laboratory waste processing.
- Recognition of tissues, cells and subcellular organelles.
- Levels of protein structural organization.
- Enzyme kinetics and mechanisms of enzyme regulation.
- Nucleic acids and genome organization.
- Isolation and quantification of biological macromolecules.
- Molecular mechanisms involved in physiologic processes.
- Structure analysis of biological macromolecules.
- Biotechnological applications.
- Use of scientific literature for data and information analysis.
- Relationship of Biochemistry with other scientific areas.
- Ethical, social, economic and environmental implications of biochemical activity.

## Professional opportunities

Graduates from our Bachelor's Degree are wellqualified to knowledge disseminate at different levels, both in secondary and higher education. Regarding scientific research, they can further specialize in Biochemistry, Molecular Biology or other interdisciplinary field of study. Additionally, our degree qualifies students to develop a professional career in different areas of the healthcare sector such as Clinical Analysis, Biochemistry, Microbiology, Parasitology or Immunology. In the productive sector, these professionals are in demand for positions in management and business related to Molecular Biosciences.





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Grados UCM



Faculty of Chemical Sciences

Campus de Moncloa  
[quimicas.ucm.es](http://quimicas.ucm.es)

For further information: [www.ucm.es/estudios/grado-bioquimica](http://www.ucm.es/estudios/grado-bioquimica)

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