

**Practicum**

Code: 100974  
ECTS Credits: 12

| Degree               | Type | Year | Semester |
|----------------------|------|------|----------|
| 2500502 Microbiology | OT   | 4    | 0        |

**Contact**

Name: Antonio Solé Cornellà  
Email: Antoni.Sole@uab.cat

**Use of languages**

Principal working language: catalan (cat)  
Some groups entirely in English: No  
Some groups entirely in Catalan: No  
Some groups entirely in Spanish: No

**Prerequisites**

To apply for the course, you are required to have passed the degree first year and, at least, 120 credits out of 180 credits in the first three years.

In addition, you must be enrolled at the time when you start the internship and have paid the fees for the accident and civil liability insurance, as informed in the tax regulations.

**Objectives and Contextualisation**

This is an elective course that should be taken preferably during the fourth year or the summer after finishing the programmed activities of the degree third year.

The objectives of the course are:

- . To promote the integration of the student in the corporate world or in a research group, either in a public or private institution.
- . To know and to apply biochemical or molecular biology techniques that are typically used in a industrial setting or in specific research projects.
- . To prepare a report on the practice internship in an autonomous manner.

**Skills**

- Adapt to new situations.
- Apply knowledge of theory to practice
- Apply microorganisms or their components to the development of products of interest in health, industry and technology.
- Apply suitable methodologies for taking samples and characterising and manipulating microbial populations and communities in natural and artificial ecosystems, and establish the relationships between these and those with other organisms.
- Apply suitable methodologies to isolate, analyse, observe, cultivate, identify and conserve microorganisms.

- Apply the principles of risk assessment and prevention in the laboratory, and biosafety regulations on microorganisms and manipulation of different biological systems.
- Apply tools based on microorganisms to assess the environmental impact of human activity, and to recover contaminated environments.
- Assess the quality and/or microbiological safety of foods, water, drugs, cosmetics and other natural or artificial products.
- Characterise the causal agents of microbial diseases in humans, animals and plants in order to diagnose and control them, perform epidemiological studies and be aware of present-day problems with these diseases and strategies to combat them.
- Communicate orally and in writing.
- Comply with principles of bioethics and professional codes of conduct.
- Design and apply methods and strategies for isolating and selecting new microorganisms and for genetically manipulating microorganisms of interest.
- Design and control processes of microbial origin and participate in productive processes in which microorganisms intervene.
- Design and obtain microbial vectors and microorganisms that are useful for making products of interest and for genetically modifying other living beings.
- Design and use disinfection and sterilisation treatments and also methods for assessing their effectiveness.
- Design experiments and interpret the results
- Develop creativity and initiative.
- Develop critical reasoning skills in the field of study and in relation to the social context.
- Display a capacity for analysis, synthesis, organisation, planning and decision-making.
- Display an entrepreneurial spirit and leadership skills
- Display sensibility towards environmental, health and social matters.
- Ethical commitment.
- Identify and solve problems.
- Know and apply safety and quality regulations in microbiology.
- Know and use -omics tools (genomics, transcriptomics, proteomics, metagenomics, etc.).
- Obtain, select and manage information.
- Use bibliography or internet tools, specific to microbiology or other related disciplines, both in English and in the first language.
- Use molecular and immunological techniques in the characterisation of microorganisms and materials of biological origin.
- Work individually or in groups, in multidisciplinary teams and in an international context.

## Learning outcomes

1. Adapt to new situations.
2. Apply knowledge of theory to practice
3. Apply microorganisms or their components to the development of products of interest in health, industry and technology.
4. Apply suitable methodologies for taking samples and characterising and manipulating microbial populations and communities in natural and artificial ecosystems, and establish the relationships between these and those with other organisms.
5. Apply suitable methodologies to isolate, analyse, observe, cultivate, identify and conserve microorganisms.
6. Apply the principles of risk assessment and prevention in the laboratory, and biosafety regulations on microorganisms and manipulation of different biological systems.
7. Apply tools based on microorganisms to assess the environmental impact of human activity, and to recover contaminated environments.
8. Assess the quality and/or microbiological safety of foods, water, drugs, cosmetics and other natural or artificial products.
9. Characterise the causal agents of microbial diseases in humans, animals and plants in order to diagnose and control them, perform epidemiological studies and be aware of present-day problems with these diseases and strategies to combat them.
10. Communicate orally and in writing.
11. Comply with principles of bioethics and professional codes of conduct.

12. Design and apply methods and strategies for isolating and selecting new microorganisms and for genetically manipulating microorganisms of interest.
13. Design and control processes of microbial origin and participate in productive processes in which microorganisms intervene.
14. Design and obtain microbial vectors and microorganisms that are useful for making products of interest and for genetically modifying other living beings.
15. Design and use disinfection and sterilisation treatments and also methods for assessing their effectiveness.
16. Design experiments and interpret the results
17. Develop creativity and initiative.
18. Develop critical reasoning skills in the field of study and in relation to the social context.
19. Display a capacity for analysis, synthesis, organisation, planning and decision-making.
20. Display an entrepreneurial spirit and leadership skills
21. Display sensibility towards environmental, health and social matters.
22. Ethical commitment.
23. Identify and solve problems.
24. Know and apply safety and quality regulations in microbiology.
25. Know and use -omics tools (genomics, transcriptomics, proteomics, metagenomics, etc.).
26. Obtain, select and manage information.
27. Use bibliography or internet tools, specific to microbiology or other related disciplines, both in English and in the first language.
28. Use molecular and immunological techniques in the characterisation of microorganisms and materials of biological origin.
29. Work individually or in groups, in multidisciplinary teams and in an international context.

## **Content**

The contents of this course are variable, depending on the specific institution in which the student internship takes place.

However, in all cases, the contents of the proposed activity should keep a close relationship with Microbiology, be it in a company or in a research group.

Two kinds of modalities exist:

Modality A: Internal positions UAB

Modality B: External positions

Students in Modality A should have an academic tutor.

Students in Modality B should be tutored by a member of the course teaching staff and by an external tutor.

The course can be taken in either one of the following periods: summer of 3rd year, 1st semester of 4th year, 2nd semester of 4th year, or summer of 4th year. The duration of each period will be published each academic year on the website of the Facultat de Biociències.

## **Methodology**

The students may find all the relevant course information, in the website of the Facultat, section Pràctiques Acadèmiques en Entitats.

Each academic year, the responsible for the course jointly with the Facultat will organize an orientation session for third and fourth year students enrolled in the Microbiology degree.

## **Activities**

| Title                            | Hours | ECTS | Learning outcomes   |
|----------------------------------|-------|------|---|
| <b>Type: Supervised</b>          |       |      |   |
| Practice internship              | 280   | 11.2 | 1, 7, 2, 6, 5, 4, 3, 8, 9, 22, 24, 25, 18, 17, 16, 12, 13, 14, 15, 23, 20, 26, 11, 10, 29, 21, 19, 27, 28 |
| <b>Type: Autonomous</b>          |       |      |   |
| Final written report preparation | 18    | 0.72 | 22, 18, 17, 26, 10, 21, 19, 27  |

## Evaluation

The course assessment will include the following items:

- The evaluation of the final written report prepared by the student (weight in the final score: 40 %). The use of English in the report will be considered for up to additional 0.5 points in this section.
- The evaluation report on the student's performance issued by the Academic Tutor (Modality A) / External Tutor (modality B) (weight in the final score: 60 %).

The final written report must be delivered electronically to the course coordinator not later than 15 days after the end of the stay. In exceptional cases, which must be authorized by the course coordinator, this period may be extended up to a maximum of 30 days.

In order for the student to be evaluated, the course coordinator must receive the tutor's evaluation report and the written report prepared by the student. If any of these requirements is not met, the student's grade will be No evaluable.

The instructions for the preparation of the final written report can be found in the Facultat de Biociències website, section Pràctiques Acadèmiques en Entitats.

## Evaluation activities

| Title   | Weighting | Hours | ECTS | Learning outcomes   |
|---|-----------|-------|------|---|
| Evaluation report by academic or external tutor | 60        | 1     | 0.04 | 1, 7, 2, 6, 5, 4, 3, 8, 9, 22, 24, 25, 18, 17, 16, 12, 13, 14, 15, 23, 20, 26, 11, 10, 29, 21, 19, 27, 28 |
| Final written report                            | 40        | 1     | 0.04 | 1, 7, 2, 6, 5, 4, 8, 9, 22, 24, 25, 18, 17, 16, 12, 13, 14, 15, 23, 20, 26, 11, 10, 29, 21, 19, 27, 28    |

## Bibliography

The contents of the Bibliography list may vary depending on the specific work that each student performs during his/her practice internship and what he/she may need to prepare the final written report.