COURSE GUIDE – EXTENDED FORM

Academic year 2026 – 2027

1. Program information

1.1 University	*Université de Rouen Normandie (URN)*
1.2 Faculty	
1.3 Department	*UFR Sciences et Techniques – Department of Biology*
1.4 Field	*Microbiology*
1.5 Study level	*Master 2*
1.6 Specialization	*Chemical and Biochemical Process Technology - CBPT*

2. Course information

2.1.1 Course name	**Microbial Ecology for Biotechnology (sub-courses of UE Microbial Ecology, M1 Microbiology Health, Well-being and Industry)**						
2.1.2 Course code	601	2.1.3. Course category Fundamental/Specialized/Complementary)	S				
2.2 Course instructor	Yannick Colin, Marion Gueganton, Thierry Berthe						
2.3 Course instructors for applied activities (S, L, P, Pr)	n/a						
2.4 Year of study [2]	2	2.5 Semesterl[3]	3	2.6 Evaluation type[4]	E, A	2.7 Course type [5]	DOB

3. Amount of time estimated for course activities (hours / term)

3.1 Hours /week	1	3.2 course	1	3.3a sem.	1	3.3b laboratory		3.3c project		3.3.d. practice	
3.4 Total hours from curriculum[6]	28	3.5 course	14	3.6a sem.	14	3.6b laboratory		3.6c project			

Time spent for related activities[7]	Hours
Study of recommended books, course support, scientific papers and course notes	20
Study in library and practical skills development	29
Preparation of seminars / laboratory works / project phases / home works / presentations	29
Evaluation[8]	2
Other activities:	

3.7 Total hours of individual study [9]	78
3.8 Total hours per semestre[10]	108
3.9 Number of credits	4

4. Prerequisites (optional)

4.1 curriculum[11]	A solid understanding of basic concepts at the undergraduate level in microorganism biology, molecular and cell biology is required to successfully follow this course.
4.2 learning outcomes	This course is intended for students with background in microbiology who whish to acquire essential knowledge in microbial ecology in order to enhance their expertise in the environmental field

5. Requirements

5.1 Conditions for course delivery[12]	Blackboard, video projector. All digital course materials and resources will be provided through the university's virtual learning environment (UniversiTICE).
5.2 Seminar / Laboratory / Project delivery requirements[13]	Blackboard, video projector. All digital course materials and resources will be provided through the university's virtual learning environment (UniversiTICE).

	Some learning activities and coursework may involve frequent use of digital tools and computer-based resources.

6. Overall objective of the course

The course aims to provide students with a foundational understanding of the key concepts in microbial ecology, focusing on the roles and dynamics of microbial communities in natural environments such as water, soil, and sediments.

7. Learning outcomes

Knowledge	The student / graduate will be able to: - Understand the microbial foundations relevant to environmental systems and contaminated sites - Understand the objectives and the techniques to identify and characterize microorganisms in complex communauty - Understand and apply bioremediation methods in the context of environmental monitoring and assessment - Assess health and environmental risks associated with microorganisms
Skills	The student / graduate will be able to: - Use microbial culture, isolation, and identification techniques. - Apply methods for analyzing microbial diversity. - Interpret experimental data from microbial ecology studies.
Responsibility and autonomy	The student / graduate will be able to: - Use advanced digital tools for data analysis. - Communicate scientific results effectively in written and oral English. - Contribute to a collaborative scientific analysis.

8. Teaching methods

The teaching process will involve participatory lectures and discussions, supported by PowerPoint presentations made available to students if necessary. These presentations include images and diagrams to make the information easier to understand and assimilate. Each seminar may be accompanied by additional readings provided by the instructor.

The teaching method is also based on activities in the fields to illustrate or develop a piece of knowledge or specific skills (Self-assessment, reports on readings or case studies for exemple). Collaborative activities may be organized to foster peer interaction and teamwork among students.

Autonomy, adherence to instructions, and a positive attitude toward learning will be actively encouraged and developed throughout the course.

9. Course content

9. 1. Courses[15]	**Teaching methods**	**Time allocation**
9.1.1. Microbial ecology and remediation of contaminated sites (Bioelectrochemistry and Phytoremediation)	*Interactive lecture* *Guided discussions* *Clarifying explanations* *Conference of experts in the field*	4 hours
9.1.2. Microbial basis		1 hours
9.1.3. Microbial ecology and strategies for detecting and identifying microorganisms (microscopy, -omics)		2 hours
9.1.4. Microbial Ecology and Its Applications (e.g., biofuel, fermentation, environmental focus on biodegradation-bioremediation)		2 hours
9.1.5. The Nitrogen cycle and its environmental impacts		3 hours

9.1.6 Evaluation of the microbial risk assessment in the environment		3 hours
Course bibliography: Relevant scientific literature will be used to support the presentation and understanding of the key concepts introduced in the course		
9.2a Seminar	Working methods [16]	Observations, Time allocation
Critical analysis of scientific articles and ecological datasets related to microbial ecology will be carried out to reinforce understanding of the key themes discussed during lectures	Students will work individually or in groups to address, discuss, and report on experimental designs, scientific studies, or datasets.	14 hours
Bibliography for applied activities (seminar / laboratory / project): Relevant scientific literature will be used to support the presentation and understanding of the key concepts introduced in the course. All sources, documents, and references used during the course sessions (including articles, book excerpts, presentation slides, videos, etc.) will be made available to students. This includes both required readings and supplementary resources intended to deepen understanding of the topics covered in class. Students are encouraged to consult these materials regularly to support their learning and active participation.		

10. Evaluation

Activity type	10.1 Evaluation criteria	10.2 Evaluation method	10.3 Percentage of the final grade *(recommended to be proportional to the number of hours allocated to each type of activity)*
10.4 Type of evaluation: Final Exam / Assessment	*Completeness and correctness of knowledge.* *Logical coherence, fluency, strength of argumentation.* *Capacity for analysis, personal interpretation, originality, creativity.* *Degree of mastery of specialized terminology and communication skills.* *Ability to apply acquired skills.* *Ability to process data and solve given problems.*	*Summative assessment test (final evaluation).*	70%
10.5a Seminar	*Ability to apply learned knowledge in practice. Ability for analysis, personal interpretation, originality, and creativity*	*Active participation in activities; Assessment test.*	30%
10.6 Conditions for passing			
The final grade corresponds to the weighted average of all results obtained from exams and assessed activities completed by the student. Grades are expressed on a scale from 0 to 20. A score of 10/20 indicates that the student has acquired the minimum required knowledge and skills, and is sufficient to validate the ECTS credits.			

Date:

Course instructors: Yannick Colin, Marion Gueganton, Thierry Berthe

Course instructors for applied activities: Yannick Colin, Marion Gueganton, Thierry Berthe

Date of approval by the department: Head of Department: Anthony Delaune

Date of approval by the Faculty Council: Dean,

Bachelor's / Master's degree.
[2] *For Bachelor's: 1-4; for Master's: 1-2.*
[3] *For Bachelor's: 1-8; for Master's: 1-4..*
[4] *Exam (E), assessment (A) – according to the curriculum.*
[5] *DOB – mandatory course, DOP– optional course, DFA– elective course;*
[6] *Duration equals 14 weeks multiplied by the number of hours listed at point 3.1 (similarly for points 3.5 and 3.6abc).*
[7] *The lines below refer to individual study; total is completed at point 3.7.*
[8] *Between 2 and 6 teaching hours, not included in individual study..*
[9] *Total number of individual study hours (sum of values from previous lines).*
[10] *Total of direct teaching hours (3.4) plus individual study hours (3.7); must equal the number of credits (3.9) multiplied by 27 hours per credit.*
[11] *Prerequisite courses that must be passed previously or their equivalents are indicated.*
[12] *Teaching resources: blackboard, video projector, flipchart, specific teaching materials, etc.*
[13] *Technical equipment: computers, software packages, experimental stands, etc*
[14] *Learning outcomes presented as knowledge, skills, responsibility, and autonomy specific to the course, aligned with level 7 of the National Qualifications Framework (NQF) and adapted to the type of university program. For research master's programs, these include competences necessary for conducting independent scientific research (https://www.aracis.ro/wp-content/uploads/2025/07/Standarde-specifice-masterat.pdf).*
[15] *Titles of chapters and paragraphs.*
[16] *Teaching methods: discussions, debates, presentations and/or paper analyses, exercises and problem solving.*
[17] *Practical demonstrations, exercises, experiments.*
[18] *Case studies, demonstrations, exercises, error analysis, etc.*