



| GENERAL MICROBIOLOGY |   |
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| Enrollment year      | 2021/2022   |
| Academic year        | 2021/2022   |
| Regulations          | DM270   |
| Academic discipline  | BIO/19 (GENERAL MICROBIOLOGY)   |
| Department           | DEPARTMENT OF CIVIL ENGINEERING AND ARCHITECTURE  |
| Course               | ENVIRONMENTAL ENGINEERING   |
| Curriculum           | Energie rinnovabili   |
| Year of study        | 1°  |
| Period               | 1st semester (27/09/2021 - 21/01/2022)  |
| ECTS                 | 6   |
| Lesson hours         | 45 lesson hours   |
| Language             | Italian   |
| Activity type        | ORAL TEST   |
| Teacher              | PASCA MARIA ROSALIA (titolare) - 6 ECTS   |
| Prerequisites        | The understanding of some topics of the course assumes the knowledge of the basic concepts of general chemistry, which will be recalled during the lessons.   |
| Learning outcomes    | The objectives of the course are: 1. Providing the basics of microbiology; 2. Studying the presence of microorganisms in different environments; 3. Application of microorganisms in solving environmental problems as wastewater treatment and bioremediation.   |
| Course contents      | Microbiology as basic and applied science. Fields of modern microbiology. Prokaryotic cell: structure and function. Differences between Prokarya and Eukarya. Microbiological techniques. Factors affecting bacterial growth. Energy production by bacteria: fermentation, respiration, photosynthesis. The origin of life. Taxonomy and classification. Archaea. Main bacterial groups. Antibiotics and vaccines. Viruses. The microorganisms in different environments: atmosphere, |

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|  | <p>hydrosphere, soil and extreme environments. Interactions between microorganisms and other organisms. Genetically modified microorganisms for the environmental biotechnology. Methods in Environmental Microbiology. Environmental problems and applications in environmental protection: biological treatment of sewage, bioremediation of contaminated sites, biofiltration, dumps, production of biofuels.</p>   |
| <b>Teaching methods</b>                            | <p>Lectures (hours/year): 45<br/> Practical class (hours/year in lecture theatre): 0<br/> Practicals / Workshops (hours/year in lecture theatre): 0</p> <p>The course is divided into frontal lessons (ppt files available to students using the Kiro UniPV multimedia platform).<br/> In the first lessons, the basic notions of biology will be provided, useful for understanding the topic of the course. Subsequently, the course will address the topics associated with general microbiology. Finally, the applications of microorganisms in bioremediation, wastewater treatment, etc.</p> |
| <b>Reccomended or required readings</b>            | <p>Prescott LM, Harley JP, Klein DA. Microbiologia. 6a edizione. Casa editrice: McGraw-Hill Barbieri P, Bestetti G, Galli E, Zannoni D. Microbiologia ambientale ed elementi di ecologia microbica. 1° edizione. Casa Editrice Ambrosiana.</p> <p>ppt files available to students using the Kiro UniPV multimedia platform.</p>  |
| <b>Assessment methods</b>                          | <p>The oral examination is divided into two parts:</p> <ol style="list-style-type: none"> <li>1. Oral presentation of about 15 minutes by projection of slides on one of the topics of the course.</li> <li>2. The second part of the oral exam will focus on the rest of the topics of the course, to assess the overall knowledge of the subject by the students.</li> </ol>   |
| <b>Further information</b>                         | <p>To have further information, please contact the teacher by e-mail (mariarosalia.pasca@unipv.it) to make an appointment.</p>   |
| <b>Sustainable development goals - Agenda 2030</b> |  |