

	<p style="text-align: center;">UNIVERSITAS PADJADJARAN FACULTY OF MATHEMATICS AND NATURAL SCIENCES</p> <p style="text-align: center;">MASTER OF SCIENCE IN BIOLOGY</p>	<p style="text-align: center;">COURSE CODE: D10D1107</p>
<p>Module designation</p>	<p style="text-align: center;">Industrial and Environmental Microbiology</p>	
<p>Semester(s) in which the module is taught</p>	<p style="text-align: center;">2</p>	
<p>Person(s) responsible for the module</p>	<p>Dr. Mia Miranti Rustama, M.P. Dr. Sri Rejeki Rahayuningsih, M.Si. Dr. Keukeu Kaniawati Rosada, M.Si. Febri Doni, S.Si., M.Sc., Ph.D</p>	
<p>Medium of instruction</p>	<p>English and Indonesian</p>	
<p>Relation to curriculum</p>	<p>Compulsory Master of Science in Biology</p>	
<p>Teaching methods</p>	<p>Lecture, discussion, cooperative learning and problem based learning</p>	
<p>Workload</p>	<p>Total workload: 8160 minutes (90,67 hours)</p> <p>CLASS</p> <p>Lecture, discussion, cooperative learning and problem based learning: 2 x 50'x 16 weeks = 1600 minutes (26.67 hours)</p> <p>Exercise : 2 x 60'x 16 weeks = 1920 minutes (32 hours)</p> <p>Private study : 2 x 60'x 16 weeks = 1920 minutes (32 hours)</p>	
<p>Credit points</p>	<p>2.00 SKS (3.62 ECTS)</p>	

Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	<ol style="list-style-type: none"> 1. After completing this course, the student will be able to know the potential of microorganisms including knowledge about the physiology, characteristics and improvement of microorganisms for industry. 2. After completing this course, the student will be able to study metabolism pathways, primary and secondary metabolite yields, improving products and by traditional fermentation and genetic engineering and applying microorganisms on a small or home or large industrial scale 3. After completing this course, the student will be able to apply microorganisms for waste management and pollution control.
Contents	<p>This course studies the understanding, exploration and application of microorganisms that play a role in the food, non-food, health and environmental industries commercially. Microbiology industry includes the use of microorganisms in producing a product such as enzymes, food, beverages, food additives, fuels, biofuels and drugs (pharmaceuticals). Environmental microbiology includes the utilization of microorganisms for waste management and pollution control.</p>
Examination forms	Essay and written examination
Study and examination requirements	<p>Minimum attendance at lectures is 80%. Final score is evaluated based on assignment and group case study reports (20%), Assignment (20%), mid semester exam (30%), and end semester exam (30%).</p>
Reading lists	<ol style="list-style-type: none"> 1. Michael T. Madigan, John Martinko, Thomas Brock, Paul Dunlap, David P. Clark, 2009. Brock Biology of Microorganisms. Pearson/Benjamin Cummings. 1061 halaman. 2. David B. Wilson, Hermann Sahm, Klaus-Peter Stahmann, Mattheos Koffas. 2020. Industrial Microbiology. Wiley publishing. 424 halaman. 3. Albert G. Moat, John W. Foster, Michael P. Spector. 2002. Microbial Physiology, Fourth Edition. Wiley-Liss, Inc. 714 halaman.