

1. Module XXIX: Impact and Application II B (Industry)

1.1. Module Objectives

On completion of this module, the students will be able to:

- describe the application of microbial knowledge (from cellular up to molecular) in environment, energy and cosmetics industries
- create and design the application related to microbial industries
- interpret the knowledge given in order to solve the problems that related in medical, environment, and industrial

1.2. Module Data

Person in charge	Dr. Dea Indriani Astuti
Credits	4
Courses	BM4106 microbiology of Extremophilic BM4107 Cosmetic microbiology
Module examination	Written test

1.2.1. Sub-module III: Microbiology of Extremophilic

Lecturer	Dr. Pingkan Aditiawati/Prof. Dr. Akhmaloka
Semester	7
Type of submodule / course	Elective
Credits	2
Workload - class lecture (hr/sem)	2 hours lectures, 2 hours structured activities, 2 hours individual study, 16 weeks per semester, and total 96 hours a semester
Workload details	Textbook reading assignment, group discussion, paper review, presentation
Classification within the curriculum:	General Studies / Compulsory Course /Elective Course
Type of assessment/examination	Written Test : Midterm exam, Final exam, Assignments Presentation
Language	Bahasa Indonesia
Course Target / Outcome	Students will be able to discover the biodiversity of thermophile microorganism and its spesific character in case of physiology adaptation to extreme condition. Student will be able to discover the potential of biotechnology from thermophile microorganism.

Teaching methods	Interactive Teaching
Contents (SAP)	
1	Introduction of microbiology in extreme condition, classification and taxonomy of extreme-thermophile microorganisms
2	Isolation and cultivation of extreme-thermophile microorganisms
3	Psicrophile
4	Thermophile
5	Piezophile
6	Asidophile
7	Mid-Term Test
8	Alkalophile
9	Methanogen
10	Overview energy forming reaction in extreme-thermophile microorganisms
11	Cell wall and membrane, <i>proton motive force</i> and transport system of extreme-thermophile microorganisms
12	Protein stability and activity in extreme temperature, pressure, and water activity
13	Nucleic acid stability and topology in hiperthermophile
14	Small molecules (coenzim, substrate) stability in high temperature
15	Biotechnology exploration
16	Final Test
Literature / Sources	<ul style="list-style-type: none"> • Horikoshi, K and Grant, W.D. Extremophiles: microbial life in extreme environments. 1st edition. New York: John Wiley & Sons. 1998 • Gerday, C. and Nicolas Glansdorff. Physiology and Biochemistry of Extremophiles. 1st edition. Washington, D.C.: ASM Press. 2000 • Cavicchioli, Ricardo. Archaea, Molecular and Cellular Biology. 1st edition. Washington, D.C.:ASM Press. 2007 • Madigan, Michael T. Brock Biology of Microorganisms. 13th Edition. Prentice Hall, Pearson Education International. 2010
Other specialties	

1.2.2. Sub-moduleIV: Cosmetic Microbiology

Lecturer	Dr. Dea Indriani Astuti/Dr. Sasanti Tarini
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Semester	7
Type of submodule / course	Elective
Credits	2
Workload - class lecture (hr/sem)	2 hours lectures, 2 hours structured activities, 2 hours individual study, 16 weeks per semester, and total 96 hours a semester
Workload details	Textbook reading assignment, group discussion, paper review, presentation
Classification within the curriculum:	General Studies / Compulsory Course / Elective Course
Type of assessment/examination	Written Test : Midterm exam, Final exam, Assignments Presentation
Language	Bahasa Indonesia
Course Target / Outcome	Students will be able to discover and define microbilla problems in cosmetic industries. Students will be able to discover, compare, choose the suitable control methods in order to produce fine cosmetic product
Teaching methods	Interactive Teaching
Contents (SAP)	
	1 Introduction of cosmetic microbiology
	2 Basic principal of cosmetic microbiology
	3 Sanitation in cosmetic microbiology
	4 Assay in cosmetic microbiology
	5 Assay in cosmetic microbiology
	6 Cosmetic preservation
	7 Mid-Term Test
	8 Free additive compound products
	9 Toxicology in cosmetic preservation
	10 Microflora in Skin
	11 Cosmetic technology
	12 Cosmetic technology
	13 Persentation
	14 Persentation
	15 Future deveolpment of cosmetic microbiology
	16 Final Test
Literature / Sources	<ul style="list-style-type: none"> • Geis, P.A. 2006. Cosmetic Microbiology: A Practical Approach. CRC Press. • Orth, D. 2009. Insights into Cosmetic Microbiology. Allured Pub. Corp.

Other specialties	
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