

1. Module XXI: Impact and Application II (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 medical, environment, and food industries
- create, formulate, 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
- develop and apply the industrial microbiology knowledge to solve human problems

1.2. Module Data

Person in charge	Dr. Dea Indriani Astuti
Credits	5
Courses	BM 4103 Food Microbiology BM 4102 Microbial-Based Product Development
Module examination	Written test

1.2.1. Sub-module I: Food Microbiology

Lecturer	Dr. Dea Indriani Astuti
Semester	7
Type of submodule / course	Compulsory
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 able to define and apply the knowledge to solve microbial problems that related to food, for examples: analysis food quality in microbiology aspect, decide the expired date of food. Students also will be able to discover the microbial source in food, so that they can track down the contamination sources in case of food poisoning. Students will be able to choose, prepare, and develop microorganisms in order to increase food nutrition, for example: fermented food.
Teaching methods	Interactive Teaching
Contents (SAP)	
1	Microorganisms in food
2	The growth of microorganisms in food
3	The benefits of microorganisms in food
4	Presentation of fermented food
5	Presentation of fermented food
6	Presentation of fermented food
7	Mid-Term Test
8	Food spoilage caused by microorganism
9	"Food borne" diseases
10	Presentation of various diseases caused by microorganisms in food
11	Presentation of foodborne diseases
12	Presentation of foodborne diseases
13	Microbial control in food
14	HACCP
15	Food industrial visiting
16	Final Test
Literature / Sources	<ul style="list-style-type: none"> • Jay, J.M. Modern Food Microbiology, 6th ed. 2000. APAC Publ. Singapore • Ray, B. 1996. Fundamental Food Microbiology. CRC Press LLC, USA. • Yousef, A.E. and C. Carlstrom. Food Microbiology: A Laboratory Manual. 2003. John Wiley and Sons, USA.
Other specialties	

1.2.2. Sub-module II: Development of microbial-based product

Lecturer	Dr. Gede Suantika/ Dr. Nyoman P. Aryantha/ Dr. Dea Indriani Astuti
Semester	7
Type of submodule / course	Compulsory
Credits	3
Workload - class lecture (hr/sem)	3 hours lectures, 3 hours structured activities, 3 hours individual study, 16 weeks per semester, and total 144 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 define and describe the concept and application of microbial processes that use in microbial-product development in food, health, energy, and environment sector. Students will be able to: 1.choose and modify (optimise) microbial processes as basic of product development 2.Define and describe basic principle development microbial-based product 3.define and identify development and production process problems. 4.Asses standarisation of product 5.Examine the suitable design of product 6.Analyse market demand of microbial-based product
Teaching methods	Interactive Teaching
Contents (SAP)	
	1 The knowledge of microbial-based product
	2 Basic Pricipals of microbiology in life-based product development
	3 Microbial role in product development
	4 Microbial role in product development
	5 Microbiology process control in production
	6 Microbiology process control in production
	7 Mid-Term Test
	8 Introduction of raw materials in production process
	9 Development of food product
	10 Development and production of fine chemicals
	11 Development and production of energy

	12	Development of environmental product
	13	Product presentation
	14	Product presentation
	15	Product presentation
	16	Final Test
Literature / Sources		<ul style="list-style-type: none"> • Shimasaki, C. D. (2009) The Business of Bioscience : What Goes Into Making a Biotechnology Product. Springer • El Mansi, E. M. T., Bryce, C. F. A., Demain, A. L., Adman, A. R. (2011) Fermentation Microbiology and Biotechnology. CRC Press • Rittman, B. E., Mc Carty, P.L. (2010) Environmental Biotechnology • Strohl, W. (1997) Biotechnology of Antibiotics
Other specialties		

