Module Handbook of Biological Safety

Module designation	The Biological Safety course is a course aimed at students of the Agricultural Microbiology program, Faculty of Agriculture. The course studies the basic concepts of biological safety and its role in laboratory work, as well as its application to various branches of biological science. The course also studies about knowledge of risk assessment, containment measures, and best practices for preventing exposure to hazardous biological agents.
Semester(s) in which the module is taught	Fourth/Sixth Semester
Person responsible for the module	Ir. Ngadiman, M.Si., Ph.D.
Language	Bahasa Indonesia/Indonesian Language
Relation to curriculum	*Elective Course*
Teaching methods	Lecture are conducted in the class with 30-40 students. In every meeting, there will be delivered interactive lecture and discussion. In some topics there will be quizzes, individual and/or group assignment. Details: 1. Lectures 2. Assignment (Individual and Group) 3. Discussion 4. Midterm 5. Final Exam
Workload (incl. contact hours, self-study hours)	- Lectures = 2 SKS x 50 minutes x 16 meetings = 1.600 minutes = 26,67 hours = 26,67 hours/27,1 hours = 0,98 ECTS - Assignment = 2 SKS x 60 minutes x 16 meetings = 1.920 minutes = 32 hours = 32 hours/27,1 hours = 1,18 ECTS - Self Study = 2 SKS x 60 minutes x 16 meetings = 1.920 minutes = 32 hours = 32 hours/27,1 hours = 1,18 ECTS Total Workload = 3,34 ECTS
Credit points	*2/0 Credit Points*
Required and recommended prerequisites for joining the module	*None*

<table>
<tr><td>Module objectives/intended learning outcomes</td><td>Program Learning Outcomes (PLO):
PLO1: Able to explain theoretical concepts regarding plant production technology by giving attention to economic and social-humanitarian aspects to achieve quality, sustainable and profitable agriculture
PLO2: Able to explain theoretical concepts of biology microorganism and develop microbial-based technology to increase plant production and environmental services.
PLO3: Able to identify, design, implement, and solve problems that arise in the implementation of agricultural businesses.

Course Learning Outcomes (CLO):
CLO1: Students are able to explain the principles of biological safety when working in the laboratory.
CLO2: Students are able to apply the basics of biological safety in laboratory management.
CLO3: Students are able to explain the regulations for processing laboratory waste.</td></tr>
<tr><td>Content</td><td>1. Introduction (1 meeting)
2. Biohazard (1 meeting)
3. Mobile DNA (1 meeting)
4. GMO/Ms (1 meeting)
5. Principles of Biodiversity Safety (1 meeting)
6. Laboratory classification (1 meeting)
7. Quality Guarantee of Laboratories (1 meeting)
8. Good Laboratory Practices (1 meeting)
9. Laboratory Safety Management (1 meeting)
10. Laboratory Waste Management (1 meeting)
11. Biodiversity Safety Regulations in Indonesia (1 meeting)
12. Bioethics (1 meeting)
13. Ethics in biotechnology (1 meeting)
14. Materials Review (1 meeting)</td></tr>
<tr><td>Examination forms</td><td>High Order Thinking Skills Examination
<table><tr><th colspan="4">Grade and Score</th></tr><tr><th>Grade</th><th>Score</th><th>Grade</th><th>Score</th></tr><tr><td>A</td><td>≥ 85</td><td>C+</td><td>64,0-66,9</td></tr><tr><td>A-</td><td>82,0-84,9</td><td>C</td><td>61,0-63,9</td></tr><tr><td>A/B</td><td>79,0-81,9</td><td>C-</td><td>58,0-60,9</td></tr><tr><td>B+</td><td>76,0-78,9</td><td>C/D</td><td>55,0-57,9</td></tr><tr><td>B</td><td>73,0-75,9</td><td>D+</td><td>52,0-54,9</td></tr><tr><td>B-</td><td>70,0-72,9</td><td>D</td><td>49,0-51,9</td></tr><tr><td>B/C</td><td>67,0-69,9</td><td>E</td><td><49</td></tr></table></td></tr>
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Study and examination requirements	*To be able to take the final exams, the minimum of student attendance is 70% out of effective meetings. From 14 meetings, students must take a minimum of 10 meetings to take the exam.*
Reading list	*Main References:* 1. *Dawn P. Wooley and Karen B. Byers. 2017. Biological Safety: Principles and Practices, 5th Edition ASM Press,Washington, DC, USA.* 2. *Anwar Hadi. 2000. Sistem manajemen mutu laboratorium.* 3. *KLH.2005. PP no 21 Tahun 2005. Tentang keamanan hayati produk rekayasa genetika.* 4. *S.B. Levy and R.V. Miller. 1989. Gene transfer in the environment.* 5. *C.Ball et. al (Ed.). 2002. Cartagena protocol on Biosafety.* 6. *DepTan. 1998. Pengujian keamanan hayati produk rekayasa genetika.* 7. *DepKes. 1993. Pedoman keamanan lab. mikrobiol. dan biomedik.* 8. *WHO. 2004. Laboratory safety manual.*