





MODULE HANDBOOK

AGROTECHNOLOGY STUDY PROGRAM FACULTY OF AGRICULTURE UNIVERSITAS MUHAMMADIYAH YOGYAKARTA

2022

MODULE HANDBOOK



Agrotechnology Study Program Faculty of Agriculture Universitas Muhammadiyah Yogyakarta

CURRICULUM STRUCTURE

1. Main Course

| | Semester 1 | | |
|----|------------|---|---------|
| No | Code | Subject Course | Credits |
| 1 | KL 111 | English 1 | 2 (1-1) |
| 2 | KL 211 | Information and Communication Technology | 3 (2-1) |
| 3 | KL 313 | Pancasila and Civic Education | 3 (3-0) |
| 4 | KL 311 | Al-Islam | 2 (2-0) |
| 5 | KL 312 | Muhammadiyah Organization | 2 (2-0) |
| 6 | KU 413 | Bahasa Indonesia | 2 (2-0) |
| 7 | KU 411 | Scientific Method | 2 (2-0) |
| 8 | KP 111 | Agricultural Cultivation in Qur'an Perspective | 2 (2-0) |
| 9 | KP 113 | Climate in Qur'an Perspective | 2 (2-0) |
| 10 | KP 112 | Ecosystems in Qur'an Perspective | 2 (2-0) |
| 11 | KU127 | Entrepreneurship | 2 (2-0) |
| | | Total | 23 |

| | Semester 2 | | |
|----|------------|----------------------------------|---------|
| No | Code | Subject Course | Credits |
| 1 | KU 126 | Agroecology | 3 (2-1) |
| 2 | KU 125 | Biochemistry | 2 (1-1) |
| 3 | KU 121 | Plant Physiology | 4 (2-2) |
| 4 | KU 128 | Plant Protection | 3 (2-1) |
| 5 | KU 122 | Soil Science | 3 (2-1) |
| 6 | KU 123 | Technology of Planting Materials | 4 (2-2) |
| 7 | KU 124 | Technology of Crop Production | 4 (3-1) |
| 8 | KL 122 | English 2 | 1 (1-0) |
| | | | |
| | | | |
| | | Total | 24 |

| Semester 3 | | | |
|------------|--------|--|---------|
| No | Code | Subject Course | Credits |
| 1 | KU 135 | Management of Natural Resources | 3 (2-1) |
| 2 | KU 231 | Problems on Water-Soil-Crop Relations | 4 (2-2) |
| 3 | KU 232 | Problems on Modification of Crop Production | 4 (2-2) |
| 4 | KU 233 | Problems on Agroecosystem | 4 (2-2) |
| 5 | KL 133 | English 3 | 1 (1-0) |
| 6 | KU 341 | Postharvest Physiology | 4 (3-1) |
| 7 | KU 342 | Postharvest Technology | 4 (3-1) |
| | | | |
| | | Total | 24 |

| | Semester 5 | | |
|----|------------|---|---------|
| No | Code | Subject Course | Credits |
| 1 | KP 351 | Land Use and Evaluation | 4 (2-2) |
| 2 | KL 661 | Agriculture Waste Management | 2 (2-0) |
| 3 | KP 353 | Landscape Design | 3 (2-1) |
| 4 | KP 454 | Agribusiness Management of Food Crops and Horticulture | 4 (3-1) |
| 5 | KL 665 | Plantation Plant Cultivation | 2 (2-0) |
| 6 | KL 155 | English 5 | 1 (1-0) |
| 7 | | Elective Course | 2 |
| 8 | | Elective Course | 2 |
| 9 | | Elective Course | 2 |
| | | Total | 22 |

| | Semester 4 | | |
|----|------------|---|---------|
| No | Code | Subject Course | Credits |
| 1 | KU 433 | Statistics | 3 (2-1) |
| 2 | KL 144 | English 4 | 1 (1-0) |
| 3 | KP 352 | Landscape Analysis and Planning | 4 (3-1) |
| 4 | KL 664 | Bioenergy & Sustainable Environment | 2 (2-0) |
| 5 | KP 241 | Isolation and Cultivation Technique of Biological Agents | 4 (2-2) |
| 6 | KP 242 | Production and Formulation Technique of Biofarming | 4 (2-2) |
| 7 | KU 553 | Information and Technology in Agriculture | 3 (2-1) |
| 8 | KU 442 | Research Methodology | 2 (2-0) |
| | | Total | 23 |

| | Semester 6 | | |
|----|------------|--|---------|
| No | Code | Subject Course | Credits |
| 1 | KL 166 | English 6 | 1 (1-0) |
| 2 | KL 167 | Agricultural English | 2 (2-0) |
| 3 | KU 561 | Capita Selecta Agricultural Production | 3 (3-1) |
| 4 | KU 562 | Capita Selecta Plant Cultivation | 3 (3-1) |
| 5 | KP 464 | Agribusiness Management Application | 0 (0-3) |
| 6 | | Elective Course | 2 |
| 7 | | Elective Course | 2 |
| 8 | | Elective Course | 2 |
| 9 | | Elective Course | 2 |
| | | Total | 20 |

| | Semester 7 | | |
|----|------------|--------------------------|---------|
| No | Code | Subject Course | Credits |
| 1 | | Professional Internships | 3 |
| 2 | | Community Service | 3 |
| 3 | | Thesis | 5 |
| 4 | | Elective Course | 2 |
| 5 | | Elective Course | 2 |
| | | Total | 8 |

2. Elective Courses

| | Elective Courses | | |
|----|------------------|---------------------------------|---------|
| No | Code | Subject Course | Credits |
| 1 | KL 666 | In Vitro Culture | 3 (2-1) |
| 2 | KL 667 | Medicinal Plants | 2 (2-0) |
| 3 | KL 668 | Landscape Management | 2 (2-0) |
| 4 | KL 669 | Horticultural Plant Cultivation | 2 (2-0) |
| 5 | KL 670 | Plant Growth Regulator | 2 (2-0) |
| 6 | KL 671 | Agricultural Pest | 2 (2-0) |
| 7 | KL 673 | Post-Harvest Product Analysis | 3 (2-1) |
| 8 | KL 674 | Agricultural Mechanization | 2 (1-1) |
| 9 | KL 675 | Agricultural Biotechnology | 3 (2-1) |
| 10 | KL 676 | Plant Disease Diagnosis | 2 (1-1) |
| 11 | KL 677 | Urban Farming | 2 (1-1) |
| 12 | KL 678 | Soil and Plant Analysis | 3 (2-1) |
| 13 | | Tropical Agriculture | |

Compulsory Courses

(1st Semester)

Module Handbook of Bahasa Indonesia

| Designation module | Bahasa Indonesia is a mandatory subject, which studies writing |
|-----------------------------|--|
| | and presenting scientific work in good and correct Indonesian. |
| | Lectures are given in the form of 12 face-to-face sessions in class |
| | using LCD presentations and discussions, discussion of online |
| | assignments in class, demos of scientific work products (papers, |
| | theses, journals, posters, proceedings, etc.), writing practice with |
| | interesting techniques, assignments in stages until a paper is |
| | formed and presented at the last 4 meetings. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 413 |
| Semester(s) in which the | 1 |
| module is taught | |
| Person responsible for the | Ir. Agung Astuti, M.Sc. |
| module | |
| Lecturers | 1. Ir. Agung Astuti, M.Sc. |
| (Supporting lecturer) | 2. Ir. Indira Prabasari, MP, Ph.D |
| | 3. Etty Handayano, SP.MSi |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the Agrotechnology Study Program |
| | Semester 1 |
| Type of teaching, contact | 1. Collaborative Learning |
| hours | 2. Experiential Learning |
| Workloads | 1 credits = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33 hours |
| | 2 credits = 2 x 45,33 hours |
| | = 90,67 hours |

| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
|---------------------|--|
| Credit points | 2 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | 1. Able to master the principles of the scientific method |
| learning outcomes | 2. Able to communicate effectively |
| | Course Learning Outcomes |
| | 1. Able to choose appropriate grammar according to |
| | general Indonesian spelling guidelines |
| | 2. able to demonstrate basic skills in writing scientific |
| | papers |
| | 3. Able to present scientific presentations using various |
| | scientific communication media |
| | Lesson Learning Outcomes |
| | 1. Able to choose the right EYD and effective sentences |
| | according to Indonesian language rules |
| | 2. Able to demonstrate ability in creating scientific work |
| | 3. Able to display scientific work in the form of abstracts, |
| | posters, power points and present in presentations |
| Content | 1. The meaning of Bahasa Indonesia |
| | 2. The use of written and oral language |
| | 3. The use of Bahasa Indonesia Grammatical System (EYD) |
| | 4. Sentence formation |
| | 5. Paragraphs |
| | 6. Writing scientific papers |
| | 7. Various forms of scientific work |

| | 8. Scientific oration |
|---------------------------|--|
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | Main Reference: |
| | 1. Anonymous. 1987. General Guidelines for Improved |
| | Indonesian Spelling (EYD). Faithful Library |
| | 2. Anonymous. 1990. Indonesian Big Book |
| | 3. Anonymous. 1993. General Guidelines for |
| | Formation <u>Term</u> . PT. Grasindo, Jakarta. |
| | 4. Anonymous. 1993. General Guidelines for Improved |
| | Spelling. PT. Grasindo, Jakarta |
| | 5. Fondiller, SH. 2002. Smart Writing Book. EGC, Jakarta |
| | 6. Sameto, H. 2004. How to Speak and Present with Audio- |
| | Visual. Gramedia, Jakarta |
| | Supporting Reference: |
| | 1. Kosasih, E. 2003. Grammar and Literature: Carefully |
| | Speaking Indonesian. Yrama Widya. |
| | 2. Keraf, G. 1987. Indonesian Grammar. Nusa Indah. |
| | |
| Date of amendement | 01 September 2022 |

Module Handbook of Agricultural Cultivation in Qur'an Perspective

| Designation module | The Agricultural Cultivation course in the perspective of the |
|-----------------------------|--|
| | Qur'an studies the knowledge and technology of effective plant |
| | cultivation by internalizing the content of the Qur'an in |
| | agricultural science and technology. To study this course, |
| | students must have an understanding of the Qur'an and Hadith. |
| | This course is very important for instilling Islamic philosophy in |
| | activities in the agricultural sector. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KP 111 |
| | |
| Semester(s) in which the | 1 |
| module is taught | |
| Person responsible for the | Ir. Sarjiyah, MS |
| module | |
| Lecturers | 1. Ir. Sarjiyah, MS |
| (Supporting lecturer) | 2. Dr. Ir. Gatot Supangkat, MP, IPM |
| | |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the Agrotechnology Study Program |
| | Semester 1 |
| Type of teaching, contact | Collaborative Learning and Contextual learning |
| hours | |
| Workloads | 1 credits = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | |
| | = 45,33hours |
| | = 45,33hours 2 credits = 2 x 45,33hours |
| | |
| | = 45,33hours 2 credits = 2 x 45,33hours |

| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
|---------------------|---|
| Credit points | 2 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | 1. Able to master the principles of agricultural cultivation |
| learning outcomes | technology in accordance with GAP |
| | 2. Able to demonstrate Islamic values and Pancasila |
| | Course Learning Outcomes |
| | 1. Able to interpret the principles of plant cultivation |
| | techniques |
| | 2. Being able to report that plants are a great gift from Allah |
| | SWT for humans |
| | Lesson Learning Outcomes |
| | 1. Able to describe the different principles of plant |
| | cultivation techniques applied |
| | 2. Able to interpret factors that influence plant cultivation |
| | 3. Able to discuss the greatness of Allah SWT through the |
| | diversity of plants as His creation |
| | 4. Able to show awareness that Allah SWT created plants |
| | with various benefits |
| Content | 1. Plants as living things and plants diversity |
| | 2. Benefits of plants |
| | 3. Agricultural systems and agricultural cultivation traditions |
| | in Scientific and Al-Qur'an perspective |
| | 4. Agricultural Zakat |
| | 5. Agricultural cultivation technology |

| | 6. Factors determining plant growth |
|---------------------------|--|
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Copeland, LO 1986. Principle of Seed Science and |
| | Technology. Burgess Publishing Company, Minneapolis, |
| | Minnesota, USA. |
| | 2. Djajadirana, S., 2000. Basic Dictionary of Agronomy. Raja |
| | Grafindo Persada. Jakarta. |
| | 3. Gaman, PM and KB Sherrington, 1981. The Science of Food, |
| | An Introduction to Food Science, Nutrition, and |
| | Microbiology. Second edition. Pergamon Press Plc. Oxford. |
| | England. |
| | 4. Ghazali, YA, F. Kurnianto, MKFath, and J. Ismail, 2011. |
| | Encyclopedia of the Qur'an and Hadith by Theme. Alita |
| | Aksara Media. Jakarta. |
| | 5. Goldsworthy, PR and NM Fisher, 1996. Translational |
| | Physiology of Tropical Cultivated Plants. Gadjah Mada |
| | University Press. Yogyakarta. |
| | 6. Hanani, N., JT Ibrahim, and M. Purnomo, 2003. Agricultural |
| | Development Strategy (a new idea). Lappera Main Library. |
| | Yogyakarta. |
| | 7. Harahap, A., I. Manany, I. Anshari, I. Syam, D. Poetranto, Z. |
| | Hidayah, and T. Alamsyah, 1997. Islam and the Environment. |
| | Collaboration between the Office of the State Minister for |
| | the Environment, the Indonesian Ministry of Religion, MUI. |
| | Swarna Bhumy Foundation. Jakarta. |
| | 8. Harjadi, SS, 1979. Introduction to Agronomy. Scholastic. |

| Jakarta. |
|---|
| 9. Harun, S., D. Hafidhuddin, and Hasanuddin, 2004. Zakat Law. |
| Comparative Study Regarding the Status and Philosophy of |
| Zakat Based on the Qur'an and Hadith. Antarnusa Literary |
| Library. Jakarta. |
| 10. Hay, RKM and AH Fitter, 1994. Environmental Physiology of |
| Plants. Translation. Gadjah Mada University Press. |
| Yogyakarta. |
| 11. Heddy, S., WH Susanto, and M. Kurniati, 1994. Introduction |
| to Production and Post-Harvest Handling. Raja Grafindo |
| Persada. Jakarta. |
| 12. Ibrahim, AS, 2010. Encyclopedia of Scientific Miracles of |
| Prophetic Hadith. Secrets of Plants and Their Benefits. |
| Translation. Sygma Publishing. Bandung. |
| 13. Isbandi, D., 1983. Plant Growth and Development. |
| Department of Agricultural Cultivation. Fak. Agriculture. |
| UGM. Yogyakarta. |
| 14. Jumin, HB, 1994. Basics of Agronomy. Raja Grafindo Persada. |
| Jakarta. |
| 15. Kurnia, H and HA Hidayat, 2008. Smart Guide to Zakat. |
| Qultum Media. Jakarta. |
| 16. Martin JH & WH Leonard, 1959. Principles of Field Crop |
| Production. The Macmillan Company. New York. |
| 17. Palaniappan, 1985. Cropping Systems In The Tropics. Wiley |
| Estem Limited. New Delhi. |
| 18. Qardawi, MY, 1987. Zakat Law. Comparative Study of the |
| Status and Philosophy of Zakat Based on the Koran and |
| Hadith. Translation. Inter Nusa Litera. Bogor. |
| 19. Raharjo, D., 1996. Encyclopedia of the Qur'an. Social |

| | Interpretation Based on Key Concepts. Paramadina. Jakarta. |
|--------------------|---|
| | 20. Rahman, A., 2007. Encyclopedia of Knowledge in the Al- |
| | Quran. The Most Complete Reference to Scientific Signs in |
| | the Koran. Translation. Mizania. Bandung. |
| | 21. Shehab, M., 2009. Encyclopedia of Miracles of the Koran and |
| | Hadith. Miracles of Plants and Fruits. Translation. Sapta |
| | Sentosa. |
| | 22. Sutidjo, 1986. Introduction to Agronomic Crop Production |
| | Systems. Department of Agricultural Cultivation. Fak. IPB |
| | Agriculture. Bogor. |
| | 23. PS Dictionary Compilation Team, 2003. General Agricultural |
| | Dictionary. Self-Help Spreader. Jakarta. |
| | 24. Widyastuti, T., 2012. Agricultural Cultivation from the |
| | perspective of the Qur'an. LP3M UMY. Yogyakarta. |
| | 25. Williams, CN and KT Joseph, 1970. Climate, Soil and Crop |
| | Production in The Humid Tropics. Oxford University Press. |
| | Singapore. |
| | 26. Wisnubroto, S., 1999. Introduction to Traditional Time. |
| | Pranatamangsa and Wariga. According to the Meteorological |
| | Description. Benefits in Agriculture and Social Affairs. Mitra |
| | Gama Widya. Yogyakarta. |
| Date of amendement | 01 September 2022 |

Module Handbook of Ecosystems in Qur'an Perspective

| Designation module | Ecosystems in Qur'an Perspective (EPA), is a course on |
|-----------------------------|---|
| | internalizing the content of the Qur'an in ecosystem insight. The |
| | EPA course studies 4 main topics, namely the universe and |
| | humans as caliphs, ecosystems, environmental damage, and |
| | ecosystem analysis. The Ecosystems in Al-Qur'an Perspective |
| | course is given so that students achieve basic competencies, |
| | namely understanding the nature of the creation of the universe, |
| | the mandate of humans as caliphs on earth and preserving the |
| | environment for the survival of life. Ecosystem Learning in the |
| | Al-Qur'an Perspective is designed in such a way, to produce |
| | effective and efficient learning programs with appropriate |
| | learning strategies (methods and media) based on students, able |
| | to achieve basic course competencies and soft skills. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KP 112 |
| | |
| Semester(s) in which the | 1 |
| module is taught | |
| Person responsible for the | Dina Wahyu Trisnawati, SP., M.Agr., Ph.D |
| module | |
| Lecturers | 1. Dina Wahyu Trisnawati, SP, M.Agr., Ph.D |
| (Supporting lecturer) | 2. Ir. Agus Nugroho Setiawan, MP |
| Language | Indonesian |
| Relation to curriculum | Compulsory subjects for the 1st Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Essays |
| hours | 2. Group Assignment |

| | 3. Presentation |
|---------------------|--|
| Workloads | 1 CREDITS = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 2 CREDITS = 2 x 45,33hours |
| | = 90,67 hours |
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| Credit points | 2 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | 1. Able to master the principles of natural resource |
| learning outcomes | management and regional planning |
| | 2. Able to demonstrate Islamic values and Pancasila |
| | Course Learning Outcomes |
| | 1. Able to understand the basic principles of environmental |
| | management |
| | 2. Able to understand the mechanisms of environmental |
| | damage |
| | 3. Able to discuss Islamic values in environmental |
| | management |
| | Lesson Learning Outcomes |
| | 1. Able to explain environmental components and the |
| | relationships between components |
| | 2. Able to provide examples of the role of humans in the |
| | environment |
| | 3. Able to explain the causes and mechanisms of |

| | environmental damage |
|---------------------------|---|
| | 4. Able to discuss environmental management based on |
| | Islamic values |
| | 5. Able to convey an Islamic environmental management |
| | model |
| Content | 1. Universe and humans as leader |
| | 2. Humans and the environment |
| | 3. Environmental damage |
| | 4. Environmental management and conservation |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| | |
| Reading list | Main Reference: |
| Reading list | Main Reference: 1. Sengbusch, Peter V "The Flow of Energy in Ecosystems - |
| Reading list | Main Reference: 1. Sengbusch, Peter V "The Flow of Energy in Ecosystems - Productivity, Food Chain, and Trophic Level". Botany |
| Reading list | Main Reference: 1. Sengbusch, Peter V "The Flow of Energy in Ecosystems - Productivity, Food Chain, and Trophic Level". Botany online. University of Hamburg Department of Biology. |
| Reading list | Main Reference: 1. Sengbusch, Peter V "The Flow of Energy in Ecosystems - Productivity, Food Chain, and Trophic Level". Botany online. University of Hamburg Department of Biology. http://www.biologie.uni-hamburg.de/b- |
| Reading list | Main Reference: 1. Sengbusch, Peter V "The Flow of Energy in Ecosystems - Productivity, Food Chain, and Trophic Level". Botany online. University of Hamburg Department of Biology. http://www.biologie.uni-hamburg.de/b- online/e54/54c.htm. |
| Reading list | Main Reference: 1. Sengbusch, Peter V "The Flow of Energy in Ecosystems - Productivity, Food Chain, and Trophic Level". Botany online. University of Hamburg Department of Biology. http://www.biologie.uni-hamburg.de/b- online/e54/54c.htm. 2. Pidwirny, Michael (2006). "Introduction to the Biosphere: |
| Reading list | Main Reference: 1. Sengbusch, Peter V "The Flow of Energy in Ecosystems - Productivity, Food Chain, and Trophic Level". Botany online. University of Hamburg Department of Biology. http://www.biologie.uni-hamburg.de/b- online/e54/54c.htm. 2. Pidwirny, Michael (2006). "Introduction to the Biosphere: Introduction to the Ecosystem Concept". Fundamentals |
| Reading list | Main Reference: 1. Sengbusch, Peter V "The Flow of Energy in Ecosystems - Productivity, Food Chain, and Trophic Level". Botany online. University of Hamburg Department of Biology. http://www.biologie.uni-hamburg.de/b- online/e54/54c.htm. 2. Pidwirny, Michael (2006). "Introduction to the Biosphere: Introduction to the Ecosystem Concept". Fundamentals of Physical Geography (2nd Edition). |
| Reading list | Main Reference: 1. Sengbusch, Peter V "The Flow of Energy in Ecosystems - Productivity, Food Chain, and Trophic Level". Botany online. University of Hamburg Department of Biology. http://www.biologie.uni-hamburg.de/b- online/e54/54c.htm. 2. Pidwirny, Michael (2006). "Introduction to the Biosphere: Introduction to the Ecosystem Concept". Fundamentals of Physical Geography (2nd Edition). http://www.physicalgeography.net/fundamentals/9j.htm |
| Reading list | Main Reference: 1. Sengbusch, Peter V "The Flow of Energy in Ecosystems - Productivity, Food Chain, and Trophic Level". Botany online. University of Hamburg Department of Biology. http://www.biologie.uni-hamburg.de/b- online/e54/54c.htm. 2. Pidwirny, Michael (2006). "Introduction to the Biosphere: Introduction to the Ecosystem Concept". Fundamentals of Physical Geography (2nd Edition). http://www.physicalgeography.net/fundamentals/9j.htm I |
| Reading list | Main Reference: 1. Sengbusch, Peter V "The Flow of Energy in Ecosystems - Productivity, Food Chain, and Trophic Level". Botany online. University of Hamburg Department of Biology. http://www.biologie.uni-hamburg.de/b- online/e54/54c.htm. 2. Pidwirny, Michael (2006). "Introduction to the Biosphere: Introduction to the Ecosystem Concept". Fundamentals of Physical Geography (2nd Edition). http://www.physicalgeography.net/fundamentals/9j.htm I 3. Al Quran and Hadith |

Module Handbook of Information and Communication Technology

| Designation module | The Information and Communication Technology course is a |
|-----------------------------|---|
| | basic course designed to achieve students' basic competencies in |
| | understanding the direction of development of the information |
| | era, assessing information on websites, the latest information |
| | technology in the agricultural sector, the use of information in |
| | forming personal branding, and the use of software to support |
| | academic activities. This course is carried out in 16 lecture |
| | meetings and 16 practical meetings, which are divided into 16 |
| | weeks, so that in 1 week there will be 2 face-to-face meetings in |
| | class. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 211 |
| | |
| Semester(s) in which the | 1 |
| module is taught | |
| Person responsible for the | Ir. Nafi Ananda Utama, MS |
| module | |
| Lecturers | 1. Ir. Nafi Ananda Utama, MS |
| (Supporting lecturer) | 2. Taufiq Hidayat, SP, M.Sc. |
| | 3. Dr. Ir. Ihsan Nurkomar, SP. |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the Agrotechnology Study Program |
| | Semester 1 |
| Type of teaching, contact | Case Study, Lectures, Experiential Learning |
| hours | |
| Workloads | 1 credits = 170 minutes x 16 meetings |
| | = 2.720 minutes |

| | = 45,33hours |
|---------------------|--|
| | 3 credits = 3 x 45,33hours |
| | = 136 hours |
| | Workload = 136 hours/ 30 hours = 4,53 ECTS |
| Credit points | 3 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | 1. Able to master the principles of the scientific method |
| learning outcomes | 2. Able to communicate effectively |
| | Course Learning Outcomes |
| | 1. able to understand the development of the information |
| | era in the 21st century and its use in scientific methods |
| | 2. Able to practice the use of various means of |
| | communication based on the latest technology |
| | Lesson Learning Outcomes |
| | 1. Able to understand the impact of the information age on |
| | knowledge workers in the 21st century |
| | 2. Able to know how to determine a trustworthy website |
| | 3. Able to know the development of information technology |
| | in the 21st century |
| | 4. Able to practice using Microsoft Office as a medium for |
| | communication |
| | 5. Able to practice design software as support in |
| | communication media |
| | 6. able to practice social media as a means of personal |
| | branding |

| Content | 1. Character Information |
|---------------------------|--|
| | 2. Impact of ICT on Knowledge Workers |
| | 3. Understanding the Internet |
| | 4. The use of internet to search for information |
| | 5. Search Engine Operation |
| | 6. Internet Agriculture |
| | 7. Telecommunication |
| | 8. The basis for creating a UMY Blog and developing a UMY |
| | Blog |
| | 9. Descriptive writing filling |
| | 10. Types of hardware, how hardware works, types of |
| | software, how software works, work synchronization of |
| | hardware and software |
| | 11. Practice using MS Word for writing assignments, exams |
| | according to standards |
| | 12. Practice using MS Excel for assignments, exams according |
| | to standards |
| | 13. Practice using MS PPT for assignment presentations |
| | according to the standard |
| | 14. Practice using Corel Draw to support lectures activities |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Computer History Museum (Please CLICK to learn more |
| | about Computer history) |
| | 2. Baldauf and Stair. 2011. Succeeding with Technology. |
| | Course Technology. ISBN: 0-538-74578-9. |
| | 3. Alan Evans, Kendall Martin, Mary Anne Poatsy. 2015. |

| | Technology in Action. Pearson Education Limited |
|--------------------|---|
| | 4. Computer Hardware and software(Please CLICK to learn |
| | more about Computer devices) |
| | 5. Microsoft Word Tutorials(Please CLICK to learn Microsoft |
| | Word online) |
| | 6. <u>How stuff Works</u> (Please Click How Computer works) |
| Date of amendement | 01 September 2022 |

Module Handbook of Climate in Qur'an Perspective

| Designation module | The Climate Course in the Al-Qur'an Perspective is a learning |
|-----------------------------|--|
| | activity consisting of face-to-face teaching activities in class and |
| | psychomotor activities in the laboratory/field with a load of 2 |
| | credits. At length, this course is equipped with the internalization |
| | of Islamic values originating from the verses of the Qur'an in |
| | discussing various factors and conditions for the emergence of |
| | climate phenomena on earth, the position of the earth in the |
| | Galactic System and its influence on the emergence of climate |
| | components, as well as its effect on plant growth. Thus, the |
| | Climatology course can provide knowledge and understanding to |
| | students, that in order to obtain profitable plant products, |
| | climate is one of the aspects that determine the success of |
| | agricultural businesses. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KP 113 |
| Semester(s) in which the | 1 |
| module is taught | |
| Person responsible for the | Prof. Dr. Ir. Gunawan Budiyanto, MP, IPM |
| module | |
| Lecturers | 1. Dr. Ir. Lis Noer Aini, SP, M. Si. |
| (Supporting lecturer) | 2. Prof. Dr. Ir. Gunawan Budiyanto, MP, IPM |
| | 3. Dr. Ir. Gatot Supangkat, MP, IPM |
| Language | Indonesian |
| Relation to curriculum | Compulsory subjects for the 1st Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Self-Directed Learning: Brainstorming |
| hours | 2. Discovery learning |

| | 3. Small Group Discussion |
|---------------------|---|
| | 4. Case studies |
| | 5. Practice |
| | 6. Project Based Learning |
| Workloads | 1 credits = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 2 credits = 2 x 45,33hours |
| | = 90,67 hours |
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| Credit points | 2 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | 1. Able to master the principles of natural resource |
| learning outcomes | management and regional planning |
| | 2. Able to demonstrate Islamic values and Pancasila |
| | Course Learning Outcomes |
| | 1. Be able to describe the relationship between climate |
| | components and plant growth |
| | 2. Able to analyze the components that form climate and |
| | the process of rain occurrence |
| | 3. Able to explain what can be done to mitigate and adapt |
| | to climate change |
| | 4. Able to discuss the rationality of Al-Qur'an verses relating |
| | to heaven, earth, biosphere and climate elements |
| | |

| | Lessor | Learning Outcomes |
|---------|--------|--|
| | 1. | Able to describe the relationship between climate |
| | | components and plant growth |
| | 2. | Able to describe the components of climate cloud and |
| | | rain formation and determine climate type |
| | 3. | Able to explain what can be done to mitigate and adapt |
| | | to climate change |
| | 4. | Able to discuss the rationale of the verses of the Qur'an |
| | | relating to the creation and arrangement of heaven and |
| | | earth |
| | 5. | Able to discuss the rationality of Al-Qur'an verses relating |
| | | to the Biosphere and climate dynamics |
| Content | 1. | Basic cultivation of crops, ecosystems, and |
| | | agroecosystems, earth and the solar system. (al-a'raaf: |
| | | 54) (yaa-siin: 38) (al-baqarah: 255) |
| | 2. | Solar radiation, temperature, humidity, rainfall, and wind. |
| | | (Al-an'aam: 99) (al-a'raf: 58) (Al-anbiyaa ": 30) (Ar-ruum: |
| | | 48) (Al-hijr: 22) (Ar-ra'ad: 12-13) |
| | 3. | The power of allah in maintaining and regulating the |
| | | balance in heaven and on earth. (An-nisaa ': 132) |
| | 4. | Allah commands humans not to cause harm on earth. (Al- |
| | | baqarah: 11-12) |
| | 5. | Solar radiation, daily (maximum and minimum) |
| | | temperature fluctuations; humidity; wind direction and |
| | | speed. (Al-baqarah: 22 & 258) (Ar-ra'd: 2) |
| | 6. | Climate classification using mohr, schmidt and ferguson, |
| | | oldeman, bakosurtana, irri and agrohydrology |
| | | methodology |
| | 7. | Pragmatic case of land use in several locations |

| Study and examination | Lectures, projects, self-study, assignments, quizzes |
|---------------------------|--|
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Lakitan Benjamin. 1994. Basics of Climatology. PT Raja |
| | Grafindo Rersada. Jakarta175h. |
| | 2. Tjasyono Bayong. 1992 Applied Climatology Pioneer Jaya |
| | Bandung. 274h. |
| | 3. Gunawan Budiyanto. 2001. Diktat Basic Climatology |
| | Lecture.Faculty of Agriculture, Muhammadiyah University |
| | of Yogyakarta.52h. |
| | 4. Handoko (ed.). Basic Climatology. Pustaka |
| | Jaya.Jakarta.192h. |
| | 5. Hollinger, SE 2001. Agricultural Climatology.Dept. |
| | ofnatural Resources and Environmental Sc. |
| | www.aces.uiuc.edu.21p. |
| Date of amendement | 01 September 2022 |

Module Handbook of Entrepreneurship

| Designation module | Entrepreneurship is a mandatory subject aimed at fostering |
|-----------------------------|--|
| | students' interest and ability in entrepreneurship, especially in |
| | the agricultural sector, which is based on advances in science |
| | and technology and Islamic values. This course studies the |
| | principles of business planning, which include identifying |
| | problems and solutions, developing business ideas, preparing |
| | business frameworks (models), preparing business plans and |
| | business presentations. To achieve targeted learning outcomes, |
| | this MK is equipped with a number of mini project-based |
| | learning activities for one semester. During the learning process, |
| | MK is supported by an e-learning system (MyKlass) to optimize |
| | the quality of the learning process and support the achievement |
| | of course learning outcomes. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 127 |
| | |
| Semester(s) in which the | 1 |
| module is taught | |
| Person responsible for the | Ir. Sukuriyati Susilo Dewi, MS |
| module | |
| Lecturers | 1. Ir. Sukuriyati Susilo Dewi, MS |
| (Supporting lecturer) | 2. Dr. Siti Nur Aisyah, SP |
| | 3. Dr. Ir. Nur Rahmawati, MP |
| Language | Indonesian |
| Relation to curriculum | Agrotechnology Compulsory Course Semester 1 |
| Type of teaching, contact | 1. Collaborative learning |
| hours | 2. Experiential Learning |

| Workloads | 1 credits = 170 minutes x 16 meetings |
|---------------------|--|
| | = 2.720 minutes |
| | = 45,33hours |
| | 2 credits = 2 x 45,33hours |
| | = 90,67 hours |
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| Credit points | 2 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to develop innovative businesses in the field of agricultural |
| learning outcomes | cultivation technology |
| | Course Learning Outcomes |
| | 1. Able to design potential business ideas |
| | 2. Able to demonstrate precise business planning |
| | Lesson Learning Outcomes |
| | 1. Able to plan a potential business using a design thinking |
| | approach |
| | 2. Able to realize business ideas that have been prepared |
| Content | 1. Lecture Contracts and Entrepreneurship Insights |
| | 2. Entrepreneurial concepts and motivation in general as |
| | well as an Islamic perspective and the Entrepreneurial |
| | Assistance Program in the Campus Environment |
| | 3. Definition of Creativity, and Creative Ideas for Problem |
| | Solving |
| | 4. Business Plan Proposal |
| | 5. Business economic analysis |

| | 6. Business Feasibility Study |
|---------------------------|--|
| | 7. Marketing Techniques |
| | 8. Focus Group Discussion (FGD) / Technical Guidance |
| | 9. Sales Transaction Practice Presentation I |
| | 10. Sales Transaction Practice Presentation II |
| | 11. Sales Transaction Practice Presentation III |
| | 12. Sales Transaction Practice Presentation IV |
| | 13. Sales Transaction Practice Presentation V |
| | 14. Sales Transaction Practice Presentation VI |
| | 15. Market Gallery Program |
| | 16. Entrepreneurship Competency Test |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Lewrick, M., Link, P., & Leifer, L. (2018). The design thinking |
| | playbook: Mindful digital transformation of teams, products, |
| | services, businesses and ecosystems. John Wiley & Sons. |
| | 2. Osterwalder, A., & Pigneur, Y. (2010). Business model |
| | generation: a Handbook for visionaries, game changers, and |
| | challengers (Vol. 1). John Wiley & Sons. |
| | 3. Osterwalder, A., Pigneur, Y., Bernarda, G., & Smith, A. |
| | (2015). Value proposition design: How to create products |
| | and services customers want. John Wiley & Sons |
| Date of amendement | 01 September 2022 |

Module Handbook of Scientific Method

| Designation module | Scientific Methods is a MANDATORY course for students in the |
|-----------------------------|--|
| | Agrotechnology Study Program, Faculty of Agriculture, |
| | Yogyakarta Muhammadiyah University with 2/0 credits given for |
| | 12 weeks in online and offline form. This course will guide and |
| | guide students to get used to positive, critical and analytical |
| | thinking which in general prepares students to become part of a |
| | scientific community that has sufficient rationality in solving |
| | problems. Course competencies: Students are able to analyze |
| | problems comprehensively and provide recommendations for |
| | solving problems (hard skills), as well as having the courage to |
| | express opinions, be critical and able to work in teams (soft |
| | skills) |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 411 |
| | |
| Semester(s) in which the | 1 |
| module is taught | |
| Person responsible for the | Ir. Agung Astuti, M.Sc. |
| module | |
| Lecturers | 1. Ir. Agung Astuti, M.Sc. |
| (Supporting lecturer) | 2. Dr. Ir. Gunawan Budiyanto, MP |
| | 3. Ir. Indira Prabasari, MP, Ph.D. |
| Language | Indonesian |
| Relation to curriculum | Agrotechnology Compulsory Course Semester 1 |
| Type of teaching, contact | 1. Collaborative Learning |
| hours | 2. Case Study FGD |
| Workloads | 1 credits = 170 minutes x 16 meetings |

| | = 2.720 minutes |
|---------------------|--|
| | = 45,33hours |
| | 2 credits = 2 x 45,33hours |
| | = 90,67 hours |
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| Credit points | 2 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | 1. Able to master the principles of the scientific method |
| learning outcomes | 2. Able to communicate effectively |
| | Course Learning Outcomes |
| | 1. Able to show and explain scientific reasoning |
| | 2. Able to explain the relationship between scientific |
| | methods, science and theory of truth |
| | 3. Able to summarize Scientific Methods for research |
| | 4. Able to carry out logical thinking |
| | 5. Able to carry out thought processes |
| | Lesson Learning Outcomes |
| | 1. Able to demonstrate and explain scientific reasoning in |
| | knowledge |
| | 2. Able to explain the relationship between the scientific |
| | method and the theory of truth to obtain knowledge |
| | 3. Able to develop knowledge by summarizing scientific |
| | methods to design and carry out research |
| | 4. Able to carry out logical thinking and formulate findings |
| | within a team to be presented or communicated |

| | 5. Able to carry out the thinking process in acquiring |
|---------------------------|--|
| | knowledge and able to carry out reasoning in the thought |
| | process for presentation and communication. |
| Content | 1. Development of human thought and phenomena |
| | 2. Law of causality |
| | 3. Prejudice, intuition, trial and error and reasoning |
| | 4. Logic |
| | 5. Analytic |
| | 6. Rationalism |
| | 7. Empiricism |
| | 8. Deductive, inductive |
| | 9. Facts, theories, hypotheses |
| | 10. Various theory of truth |
| | 11. Problem discovery |
| | 12. Formulation of the problem |
| | 13. Hypothesis |
| | 14. Evidence and substantiation |
| | 15. Interpretation / meaning |
| | 16. Data / facts |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Sedarmayanti and Hidayat. 2011. Research Methodology. CV. |
| | Mandar Maju. Bandung |
| | 2. Sangadji, B. 2010. Scientific |
| | method. <u>http://baimsangadji.blogspot.com/2010/11/makalah</u> |
| | -method-ilmiah-14.html |
| | 3. Agus Chandra. 2010. Scientific |

| | | Method. <u>http://www/aguschandra/2010/10/method-ilmiah/</u> |
|--------------------|----|---|
| | 4. | Aditya Nugroho. 2011. Scientific |
| | | Method. <u>http://www.adityanugroho90.blogspot.com/2011/0</u> |
| | | 3/method-ilmiah-atau-produk-ilmiah.html |
| | 5. | Suryana, 2010. Research Methods. UI Press. |
| | 6. | Research Methods Book. |
| | 7. | Human Thought Process for Acquiring |
| | | Knowledge. <u>http://penelitianaksicepat.blogspot.com/2013/07</u> |
| | | /besar-berikir-human-untuk-peroleh-knowledge.html |
| Date of amendement | 01 | September 2022 |

Module Handbook of Pancasila and Civic Education

| Designation module | Citizenship education is actually developed throughout the world, |
|-----------------------------|--|
| | although with various terms and names. This course is often |
| | referred to as civic education, citizenship education and some even |
| | call it democracy education. This course has a strategic role in |
| | preparing intelligent, responsible and civilized citizens. Based on the |
| | formulation of "Civic International" in 1995, it was agreed that the |
| | spirit of the nation's struggle which was demonstrated at |
| | independence on August 17 1945 was based on faith and devotion |
| | to God Almighty and sincerity in making sacrifices. The foundation |
| | of this struggle is the values of the struggle of the Indonesian nation. |
| | This is the spirit that every citizen of the Republic of Indonesia must |
| | have in fulfilling independence. Apart from that, the values of the |
| | struggle of the Indonesian people are still relevant in solving every |
| | problem in the life of society, nation and state and have proven |
| | their reliability. However, the values of this struggle have now |
| | experienced ups and downs in accordance with the dynamics of |
| | social, national and state life. This Pancasila and Citizenship |
| | Education course is held for 16 weeks or 16 meetings. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 313 |
| Semester(s) in which the | 1 |
| module is taught | |
| Person responsible for the | Ir. Hariyono, MP |
| module | |
| Lecturers | 1. Ir. Hariyono, MP |
| (Supporting lecturer) | 2. Dr. Ir. Gatot Supangkat, MP |
| | |

| Language | Indonesian | | | |
|---------------------------|--|--|--|--|
| Relation to curriculum | Compulsory Subjects for the Agrotechnology Study Program | | | |
| | Semester 1 | | | |
| Type of teaching, contact | Collaborative Learning | | | |
| hours | | | | |
| Workloads | 1 credits = 170 minutes x 16 meetings | | | |
| | = 2.720 minutes | | | |
| | = 45,33 hours | | | |
| | 3 credits = 3 x 45,33hours | | | |
| | = 136 hours | | | |
| | Workload = 136 hours/ 30 hours = 4,53 ECTS | | | |
| Credit points | 3 credits | | | |
| Requirements | To pass the subject, the minimum attendance is 80% and collect all | | | |
| | the assignments given | | | |
| Recommended | | | | |
| prerequisites | | | | |
| Module | Learning Outcomes | | | |
| objectives/intended | Able to demonstrate Islamic values and Pancasila | | | |
| learning outcomes | Course Learning Outcomes | | | |
| | 1. Able to discuss the role of Pancasila as a philosophy, state | | | |
| | basis and paradigm in social, national and state life | | | |
| | 2. Able to discuss obligations and rights as citizens correctly | | | |
| | and wisely | | | |
| | 3. Able to discuss the spirit of nationalism and patriotism which | | | |
| | is reflected in efforts to defend the country based on the | | | |
| | agricultural profession | | | |
| | Lesson Learning Outcomes | | | |
| | 1. Able to discuss the role of Pancasila as a philosophy, state | | | |

| | | basis and paradigm in social, national and state life |
|---------|----|---|
| | 2. | Able to discuss the concept of democracy and its |
| | | transformation in the family and society |
| | 3. | Able to discuss human obligations and rights in the family |
| | | and society |
| | 4. | Able to discuss the government system and state |
| | | administration of the Republic of Indonesia |
| | 5. | Able to discuss that HAMKAMNAS as a system contains the |
| | | ability to overcome all threats, challenges, obstacles and |
| | | disturbances that endanger the integrity and survival of the |
| | | nation and state |
| | | |
| Content | 1. | Introduction: Introduction, educational background on |
| | | pancasila and citizenship |
| | 2. | The objectives of pancasila and citizenship education, the |
| | | scope of pancasila and citizenship education |
| | 3. | The urgency of learning pancasila and citizenship education: |
| | | Introduction, the urgency of pancasila and citizenship |
| | | education in indonesia, the concept of civil society, |
| | | actualization of civil society, development of citizenship |
| | | values |
| | 4. | Human rights: Introduction, definition of human rights, types |
| | | of human rights, history of human rights development, |
| | | human rights in an islamic perspective, historical dimensions |
| | | of human rights in islam, the medina charter, the cairo |
| | | declaration, human rights in ri legislation, upholding of |
| | | human rights as a means of realizing society civil. |
| | 5. | Democracy: Introduction, democratic values, freedom of |
| | | expression, freedom of group, freedom of participation, |

| | equality between citizens, gender equality, sovereignty of |
|---------------------------|---|
| | the people, the state and society. |
| | 6. Transformation of democratic values in family and society: |
| | Introduction, rights and responsibilities in the family, society, |
| | forms of support and protection in the family, society, |
| | development of moral values in the family, society, gender |
| | equality in the family, society. |
| | 7. The state administration system: Introduction, clean |
| | governance, government system, party system, electoral |
| | system, regional autonomy |
| | 8. Building a national identity: Introduction, understanding |
| | national identity, supporting factors for the birth of national |
| | identity, pluralism and national integration, pluralism, |
| | pancasila as an ideology. |
| | 9. Transformation of islamic values in globalization: Economic |
| | globalization, global political dilemmas, homogenization and |
| | cultural reproduction in globalization, conflict and peace in |
| | globalization, transformation of islamic values in |
| | globalization. |
| | 10. Transformation of islamic values in economic development: |
| | Introduction, history of the indonesian economy, the |
| | people's economic system, indonesian business ethics |
| | standards, empowerment of people's economy, |
| | transformation of islamic values of economic development. |
| | 11. 1945 constitution: Introduction, UUD 1945 and its |
| | amendments. |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
|--------------------|--|
| Reading list | 1. carewni.kemlu.go.id > UU_NO_12_TH_2006.pdf.html |
| | 2. https://bpip.go.id/bpip/download.html?file=2020/04/28/617FIL |
| | E.pdf |
| | |
| Date of amendement | 01 September 2022 |

Module Handbook of Al-Islam

| Designation module | In this course, we will discuss the essence of the creation of the |
|-----------------------------|--|
| | universe, humans as caliphs, humans and the environment, |
| | environmental damage and conservation, as well as |
| | environmental management efforts from an Islamic perspective. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KL 311 |
| Semester(s) in which the | 1 |
| module is taught | |
| Person responsible for the | Miftahulhag. SHI. MSI |
| module | |
| Lecturers | Miftahulhag, SHI, MSI |
| (Supporting lecturer) | |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the Agrotechnology Study Program |
| | Semester 1 |
| Type of teaching, contact | 1. Contextual Instruction |
| hours | 2. Cooperative Learning |
| Workloads | 1 credits = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 2 credits = 2 x 45,33hours |
| | = 90,67 hours |
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| Credit points | 2 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |

| prerequisites | |
|---------------------|--|
| Module | Learning Outcomes |
| objectives/intended | 1. Able to make decisions logically, systematically and |
| learning outcomes | innovatively in solving problems of sustainable |
| | agricultural cultivation systems |
| | 2. Able to demonstrate Islamic values and Pancasila |
| | 3. Able to communicate effectively in Indonesian and |
| | English |
| | Course Learning Outcomes |
| | 1. Students are expected to have confidence in the |
| | existence of Allah SWT, the Angels, Prophets and |
| | Apostles, the Life Guidelines written in His Books, Allah's |
| | Provisions (Qadha and Qadar), and the true Last Day. |
| | 2. Students are expected to have commitment and moral- |
| | ethical awareness (akhlaq) which is driven by true and |
| | strong belief in Allah SWT |
| | 3. Students are expected to have the right way of thinking |
| | and good behavior in relating to God, fellow humans and |
| | nature |
| | 4. Able to show the relevance of the Al-Qur'an and the |
| | knowledge of Capita Selecta Agricultural Production |
| | 5. Able to present Islamic values and Pancasila in national |
| | and international forums |
| | Lesson Learning Outcomes |
| | 1. Students are able to explain the nature of religion and |
| | the reasons why humans must be religious. And students |
| | have the ability to think analytically and act strategically |
| | 2. Students are able to explain the meaning, scope and |
| | characteristics of Islam as well as its superiority over |

| | | other religions. And students have the ability to think |
|---------|----|---|
| | | analytically and act strategically. |
| | 3. | Students are able to explain the concept of aqidah |
| | | (belief) in Islam. And students have the ability to think |
| | | analytically and act strategically. |
| | 4. | Students are able to explain the nature and principles of |
| | | monotheism in Islam. And students have the ability to |
| | | think analytically and act strategically. |
| | 5. | Students are able to explain the meaning of the creed |
| | | and its consequences. And students have the ability to |
| | | think analytically and act strategically. |
| | 6. | Students are able to explain the basic concepts of faith in |
| | | Islam and their applications in everyday life. And students |
| | | have the ability to think analytically and act strategically. |
| Content | 1. | Human and religious understanding; history and religious |
| | | classification; human need for religion |
| | 2. | Meaning of islam; the scope of islam; characteristics of |
| | | islam; the superiority of islam over other religions; islam |
| | | as the way of life |
| | 3. | The meaning of aqidah and its difference with other |
| | | similar terms; the scope of aqidah; sources of islamic |
| | | aqidah; the principles of aqidah; the urgency of aqidah |
| | 4. | Definition of tauhid; types of tauhid; the characteristics of |
| | | human tauhid; tauhid as the islamic worldview |
| | 5. | The meaning of syahadat; terms and pillars of syahadat; |
| | | consequences of syahadat; the case which invalidates |
| | | syahadat |
| | 6. | Definition of faith; pillars of faith and its branches; cases |
| | | of cancellation of faith; implications and applications of |

| | faith in everyday life. |
|---|--|
| Study and examination requirements and forms of examination | Lectures, projects, self-study, assignments, quizzes |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | AIK (Al Islam and Kemuhammadiyahan) Education Guidelines for Timggi Muhammadiyah College; RPS-UMY 5 Muhammadiyah Central Leadership Higher Education Council |
| Date of amendement | 01 September 2022 |

Module Handbook of Muhammadiyah Organization

| Designation module | In this Course, we will discuss the essence of the creation of the |
|-----------------------------|--|
| | universe, humans as caliphs, humans and the environment, |
| | environmental damage and conservation, as well as |
| | environmental management efforts from an Islamic and |
| | Muhammadiyah perspective. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KL 312 |
| | |
| Semester(s) in which the | 1 |
| module is taught | |
| Person responsible for the | Dr. Ir. Gatot Supangkat, M.P., IPM. |
| module | |
| Lecturers | 1. Dr. Ir. Gatot Supangkat, M.P., IPM. |
| (Supporting lecturer) | 2. Miftahulhaq, SHI, MSI |
| | |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the Agrotechnology Study Program |
| | Semester 1 |
| Type of teaching, contact | 1. Contextual Instruction |
| hours | 2. Cooperative Learning |

| Workloads | 1 credits = 170 minutes x 16 meetings |
|---------------------|--|
| | = 2.720 minutes |
| | = 45,33hours |
| | 2 credits = 2 x 45,33hours |
| | = 90,67 hours |
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| | |
| | |
| Credit points | 2 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | 1. Able to make logical, systematic, and innovative decisions |
| learning outcomes | in solving problems related to sustainable agricultural |
| | cultivation systems (M1). |
| | 2. Capable of developing networks and conducting |
| | evaluations of work under one's responsibility, both |
| | independently and in groups (M3). |
| | 3. Able to demonstrate Islamic values and the Pancasila |
| | principles (S1-S7) (M3). |
| | 4. Capable of communicating effectively in both Indonesian |
| | and English (M3). |
| | Course Learning Outcomes |
| | 1. Students are expected to have a commitment and moral- |
| | ethical consciousness (akhlaq) driven by their true and |
| | strong belief in Allah SWT. |
| | Lesson Learning Outcomes |

| | 1. | Able to understand the history of development and |
|------------------------|--------|---|
| | | renewal in the Muslim world, as well as the role and |
| | | reasons for the establishment of Muhammadiyah in the |
| | | process of renewal. |
| | 2. | Able to comprehend the philosophy of life and the groups |
| | | of verse study within Muhammadiyah. |
| | 3. | Capable of understanding the preamble and the basic |
| | | principles of Muhammadiyah's constitution. |
| | 4. | Able to understand the Text of Belief and Aspirations of |
| | | Muhammadiyah's way of life. |
| | 5. | Able to understand the changes and fundamental |
| | | differences in Muhammadiyah's thought in the second |
| | | century. |
| | 6. | Capable of comprehending Muhammadiyah's role as a |
| | | missionary and renewal movement, a social and |
| | | healthcare movement, an educational movement, a |
| | | women's empowerment movement, and in politics. |
| Content | 1. | History of muhammadiyah |
| | 2. | Muhammadiyah philosophy |
| | 3. | Muqadiimah of Muhammadiyah's articles of association |
| | 4. | Muhammadiyah beliefs and goals |
| | 5. | Muhammadiyah thought |
| | 6. | Muhammadiyah's role |
| | | |
| Study and examination | Lectur | es, projects, self-study, assignments, quizzes |
| requirements and forms | | |
| of examination | | |
| Media employed | Laptop | o, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| | | |

| Reading list | 1. Sejarah Muhammadiyah |
|--------------------|--|
| | https://muhammadiyah.or.id/sejarah-berdirinya- |
| | muhammadiyah/ |
| | 2. Muqaddimah |
| | https://muhammadiyah.or.id/muqaddimah-ad-art/ |
| Date of amendement | 01 September 2022 |

Compulsory Courses

(2nd Semester)

Module Handbook of **Biochemistry**

| Designation module | A course that studies various basic chemical reactions in the cells |
|-----------------------------|---|
| | of living creatures, especially plants, related to the metabolic |
| | processes of carbohydrates, proteins, lipids and nucleic acids. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 125 |
| | |
| Semester(s) in which the | 2 |
| module is taught | |
| Person responsible for the | Ir. Indira Prabasari, Ph.D. |
| module | |
| Lecturers | 1. Ir. Indira Prabasari, Ph.D. |
| (Supporting lecturer) | 2. Dr. Siti Nur Aisyah, SP |
| Language | Indonesian |
| Relation to curriculum | Compulsory subjects for the 2nd Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Self-Directed Learning |
| | 3. Brainstorming |
| | 4. Contextual Learning |
| | 5. Discussion |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 2 credits = 2 x 45.33 hours |
| | = 90.67 hours |
| | Workload = 90.67 hours / 30 hours = 3.02 ECTS |
| Credit points | 2 |

| Requirements | To pass the subject, the minimum attendance is 80% and collect |
|---------------------|--|
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to master the principles of agricultural cultivation |
| learning outcomes | technology in accordance with GAP |
| | Course Learning Outcomes |
| | 1. Able to explain the role of biochemistry in agriculture |
| | 2. Able to explain the results of primary metabolism in |
| | plants |
| | Lesson Learning Outcomes |
| | 1. Able to explain the role and implementation of |
| | biochemistry in the agricultural sector |
| | 2. Able to summarize the biosynthesis and catabolism of |
| | carbohydrates in cultivated plants |
| | 3. Able to summarize protein biosynthesis and catabolism in |
| | cultivated plants |
| | 4. Able to summarize lipid biosynthesis and catabolism in |
| | cultivated plants |
| | 5. Able to summarize the biosynthesis and catabolism of |
| | enzymes in cultivated plants |
| | 6. Able to summarize the biosynthesis and catabolism of |
| | nucleic acids in cultivated plants |
| Content | 1. Introduction |
| | 2. Metabolism |
| | 3. Carbohydrate |
| | 4. Lipids |
| | 5. Protein |

| | 6. Enzyme |
|---------------------------|--|
| | 7. Nucleic Acid |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Lehninger, Nelson DL, Cox MM. 2007. Principles of |
| | Biochemistry 6th ed. New York: Worth Publishers. |
| | 2. Hames D., Hooper N. 2005. Biochemistry. Third edition. |
| | New York (US): Taylor & Francis Group. Editor Elizabeth |
| | Owen. |
| | 3. Heldt HW., Piechulla B. 2011. Plant biochemistry. 4th |
| | edition. London (DE): Academic Press is an imprint of |
| | Elsevier. |
| | 4. Lehninger. 1982. Principles of Biochemistry. Maryland: |
| | Worth Publ. |
| | 5. Maggy Thenawidjaja. 1993. Basics of Biochemistry |
| | Volume 1. Jakarta: Erlangga Publishers, xv, 369 pp. illus. |
| | 23 cm |
| | 6. Poedjiadi A, Supriyanti T. 2005. Basics of biochemistry. |
| | Jakarta (ID): University of Indonesia Press. |
| | 7. Soeharsono. 1982. Biochemistry 1. Yogyakarta: Gama |
| | Press. |
| | 8. Wirahadikusumah M. 2012. Biochemistry of Proteins, |
| | Enzymes and Nucleic Acids. Bandung (ID): ITB. |
| Date of amendement | 01 September 2022 |

Module Handbook of Plant Physiology

| Designation module | The Plant Physiology course is a basic course that will discuss | | | | |
|-----------------------------|---|--|--|--|--|
| | how physiological processes occur in the plant body, starting | | | | |
| | from the absorption of water and nutrients by plant roots, | | | | |
| | transpiration, metabolic processes (photosynthesis and | | | | |
| | respiration). As well as the process of plant growth and | | | | |
| | development. | | | | |
| Module level, if applicable | Undergraduate | | | | |
| Code, if applicable | KU 121 | | | | |
| | | | | | |
| Semester(s) in which the | 2 | | | | |
| module is taught | | | | | |
| Person responsible for the | Ir. Sarjiyah, MS | | | | |
| module | | | | | |
| Lecturers | 1. Ir. Sarjiyah, MS | | | | |
| (Supporting lecturer) | 2. Ir. Gatot Supangkat, MP | | | | |
| | 3. Innaka Ageng Rineksane, SP, MP Ph.D | | | | |
| | 4. Genesiska, S.Sc., M.Sc. | | | | |
| Language | Indonesian | | | | |
| Relation to curriculum | Compulsory subjects for the 2nd Semester Agrotechnology Study | | | | |
| | Program | | | | |
| Type of teaching, contact | 1. Self-Directed Learning | | | | |
| hours | 2. Lecture, Brainstorming | | | | |
| | 3. Small group discussions | | | | |
| | 4. Practice | | | | |
| | 5. Cooperative learning | | | | |
| | 6. Contextual instruction | | | | |
| Workloads | 1 credit = 170 minutes x 16 meetings | | | | |

| | = 2,720 minutes |
|---------------------|--|
| | = 45.33 hours |
| | 4 credits = 4 x 45.33 hours |
| | = 181.33 hours |
| | Workload = 181.33 hours / 30 hours = 6.04 ECTS |
| Credit points | 4 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to master the principles of agricultural cultivation |
| learning outcomes | technology in accordance with GAP |
| | Course Learning Outcomes |
| | 1. Able to classify plants based on plant morphology and |
| | anatomy |
| | 2. Able to explain plant metabolic processes |
| | 3. Able to explain the process of plant growth and |
| | development |
| | Lesson Learning Outcomes |
| | 1. Explain the characteristics of living things from the |
| | structure and organization of cells |
| | 2. Able to classify plants by comparing the results of |
| | observations in the field and relevant literature |
| | 3. Able to explain the mechanisms of absorption and |
| | translocation of water and nutrients as well as symptoms |
| | of nutrient deficiency in plants |
| | 4. Able to explain the basic concepts of plant metabolism |
| | |

| | 5. Able to explain the plant growth process and its analysis |
|---------------------------|--|
| | 6. Able to explain the process of plant development |
| Content | Benefits of crop physiology and its scope |
| | Diversity of germplasm |
| | Crop anatomy: crop organization, cell organization |
| | Crop classification: C3, C4, CAM crops, crop habitus |
| | The mechanism of absorption of water, nutrients and their |
| | translation, diffusion, osmosis, and imbibition |
| | Function and nutrient deficiency |
| | Transpiration and influencing factors |
| | Metabolism and enzymes |
| | Physiological and photosynthetic biomol (synthesis of |
| | carbohydrates, fats, and proteins) |
| | Factors affecting the speed of photosynthesis |
| | Respiration |
| | Respiration biomol (carbohydrate, fat, protein catalysis) |
| | Factors affecting respiration |
| | Crop growth and analysis |
| | Growth hormone and regulator |
| | Seed development and dormancy, juvenility, flowering and |
| | fruiting, ripening and senescence and tuber formation. |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Audus, LJ 1972. Plant Growth Substances. Leonard Hill, |
| | London |
| | 2. Lawrence, G. H. M. (1959). Taxonomy of Vascular Plants. |
| | The Macmillan Company, New York. |

| | 3. | Leopold | and | Kriedman. | 1981. | Plant | Growth | and |
|--------------------|--------|-----------|---------|--------------|---------|---------|-----------|--------|
| | | Developr | nent | | | | | |
| | 4. | Salisbury | , FB | and CWRo | ss. 199 | 5. Pla | nt Physic | ology. |
| | | Translate | ed by E | Diah and Sum | aryono. | ITB, Ba | ndung | |
| Date of amendement | 01 Sep | tember 20 |)22 | | | | | |

Module Handbook of Soil Science

| Designation module | Crop production on the surface of the earth always includes land |
|-----------------------------|--|
| | as an important part of the basic capital of agriculture. The role |
| | of soil as basic capital is very clear, because almost all of the |
| | water and elements needed by plants are absorbed through the |
| | roots. This absorption process requires an interaction site |
| | between the soil surface and the root surface. So it is very clear |
| | that in the long process of plant production, soil functions as a |
| | reservoir for water and nutrients, and economically and in |
| | regional/national interests in providing plant products, soil |
| | cannot yet be replaced by other plant production components. |
| | An easy to understand connection is that crop production is |
| | largely determined by productivity. Soil is a natural formation on |
| | the surface of the earth, which is the result of the hook-and-loop |
| | process and is typical of several soil-forming factors (parent |
| | material, climate, vegetation/organisms, relief/slope and time). |
| | The interaction of these five factors will greatly determine the |
| | quality of the soil. Therefore, studying the process of formation, |
| | development and properties of soil is absolutely necessary for all |
| | parties who want land to support the success of the crops they |
| | are cultivating. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 122 |
| Semester(s) in which the | 2 |
| module is taught | |
| Person responsible for the | Ir. Mulyono, MP |
| module | |
| Lecturers | 1. Ir. Mulyono, MP |

| (Supporting lecturer) | 2. Prof. Dr. Ir. Gunawan Budiayanto, MP, IPM. ASEAN Eng. | | | |
|---------------------------|---|--|--|--|
| Language | Indonesian | | | |
| Relation to curriculum | Compulsory subjects for the 2nd Semester Agrotechnology Study | | | |
| | Program | | | |
| Type of teaching, contact | 1. Lecture | | | |
| hours | 2. Self-Directed Learning: Brainstorming | | | |
| | 3. Small Group Discussion | | | |
| | 4. Practice | | | |
| | 5. Field Studies | | | |
| Workloads | 1 credit = 170 minutes x 16 meetings | | | |
| | = 2,720 minutes | | | |
| | = 45.33 hours | | | |
| | 3 credits = 3 x 45.33 hours | | | |
| | = 136 hours | | | |
| | Workload = 136 hours/ 30 hours = 4.53 ECTS | | | |
| Credit points | 3 | | | |
| Requirements | To pass the subject, the minimum attendance is 80% and collect | | | |
| | all the assignments given | | | |
| Recommended | | | | |
| prerequisites | | | | |
| Module | Learning Outcomes | | | |
| objectives/intended | Able to apply technology in agricultural systems | | | |
| learning outcomes | Course Learning Outcomes | | | |
| | 1. Able to explain the potential of land as basic agricultural | | | |
| | capital from a soil health perspective | | | |
| | 2. Able to identify soil properties as a basis for determining | | | |
| | soil fertility | | | |
| | 3. Able to identify soil fertility in plant cultivation practices | | | |
| | Lesson Learning Outcomes | | | |

| | 1. Able to explain the position of land resources in the plant |
|---------------------------|--|
| | production process as an agricultural resource asset |
| | 2. Students are able to explain the properties of soil as a |
| | basis for determining soil fertility |
| | 3. Students understand aspects of soil fertility as a basis for |
| | plant cultivation practices |
| Content | 1. Biosphere system |
| | 2. Volcanic activity |
| | 3. Soil parent material |
| | 4. Weathering process |
| | 5. Horizontal differentiation |
| | 6. Soil properties and their performance |
| | 7. Interaction between soil properties and the concept of |
| | soil fertility. |
| | 8. The concept of soil as a natural bioreactor |
| | 9. Technical calculation of fertilizer requirements |
| | 10. Crop cultivation techniques |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. The book Basics of Soil Science by Dr. Ir. Kemas Ali Hanafi, |
| | MS |
| | 2. https://earth.gsfc.nasa.gov/bio/ |
| | 3. Soil Science Book by Hardjowigeno |
| Date of amendement | 01 September 2022 |

Module Handbook of Technology of Crop Production

| Designation module | Plant Cultivation Technology (KU 124), is a course to prepare |
|-----------------------------|--|
| | students to master effective plant cultivation methods and |
| | technology from pre-production, production, harvest to post- |
| | harvest) in sustainable agricultural systems both conventional |
| | and modern |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 124 |
| Semester(s) in which the | 2 |
| module is taught | |
| Person responsible for the | Ir. Hariyono, MP |
| module | |
| Lecturers | 1. Ir. Hariyono, MP |
| (Supporting lecturer) | 2. Ir. Sukuriyati Susilo Dewi, MS |
| | 3. Ir. Titiek Widyastuti, MS |
| Language | Indonesian |
| Relation to curriculum | Compulsory subjects for the 2nd Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Self-Directed Learning: Lecture, Brainstorming |
| hours | 2. Small Group Discussion |
| | 3. Field Studies |
| | 4. Practice |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 4 credits = 4 x 45.33 hours |
| | = 181.33 hours |
| | Workload = 181.33 hours / 30 hours = 6.04 ECTS |

| Credit points | 4 |
|---------------------|--|
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to master the principles of agricultural cultivation |
| learning outcomes | technology in accordance with GAP |
| | Course Learning Outcomes |
| | 1. Able to carry out pre-planting activities in accordance |
| | with GAP |
| | 2. Able to carry out planting and maintenance activities in |
| | accordance with GAP |
| | 3. Able to carry out primary harvest and post-harvest |
| | activities in accordance with GAP |
| | Lesson Learning Outcomes |
| | 1. Able to practice seeding and land processing techniques |
| | in accordance with GAP |
| | 2. Able to practice land processing techniques in accordance |
| | with GAP |
| | 3. Able to implement planting techniques that comply with |
| | GAP |
| | 4. Able to apply various plant care techniques in accordance |
| | with GAP |
| | 5. able to carry out primary harvest and post-harvest |
| | techniques for various agricultural commodities |
| | 6. Able to compare conventional and modern plant |
| | cultivation |
| Content | 1. Aspects of crop cultivation and alternative technology |

| | 2. Crop life cycle and crop utility |
|---------------------------|--|
| | 3. Supporting sciences for crop cultivation technology |
| | 4. Seeding: Preparation of cropping media, seeds, and |
| | maintenance |
| | 5. Know the types of production land |
| | 6. Land Preparation: Introduction to tillage tools and their |
| | techniques |
| | 7. Know the cropping system and cropping patterns |
| | 8. Transplanting (in paddy fields and moor) |
| | 9. Introduction of alternative crop cultivation technologies |
| | 10. Treatments including embroidery, fertilization, weeding, |
| | overgrowing and perempelan/wiwilan. |
| | 11. Post-harvest |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Complete & Practical Guide to the Most Profitable |
| | Hydroponic Cultivation by Elisa |
| | 2. Chili Cultivation in Narrow Land by Suriana and Neti |
| | 3. Rice cultivation in Java by Sajogyo |
| | 4. Cultivating Rice on Marginal Land Tips for Increasing Rice |
| | Production by Zulman Harja and Utama |
| Date of amendement | 01 September 2022 |

Module Handbook of **Plant Protection**

| Designation module | Plant Protection is a course to prepare students to master |
|-----------------------------|--|
| | integrated pest control in relation to cultivation systems to |
| | support Good Agricultural Practices (GAP) which are based on |
| | advances in Science and Technology. This course studies the |
| | types of plant pest organisms such as pests, diseases and weeds, |
| | plant cultivation systems and integrated pest management. To |
| | study this course students must have an understanding of |
| | agronomy and land management. This course is very important |
| | to introduce integrated control technology to support |
| | sustainable agriculture. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 128 |
| Semester(s) in which the | 2 |
| module is taught | |
| Person responsible for the | Dina Wahyu Trisnawati, SP, M.Agr., Ph.D. |
| module | |
| Lecturers | 1. Dina Wahyu Trisnawati, SP, M.Agr., Ph.D. |
| (Supporting lecturer) | 2. Dr. Ihsan Nurkomar, SP |
| | 3. Dr. Siti Nur Aisyah, SP |
| | 4. Ir. Agus Nugroho Setiawan, MP |
| Language | Indonesian |
| Relation to curriculum | Compulsory subjects for the 2nd Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Self Directed Learning: |
| | 3. Brainstorming |
| | 4. Small group discussions |

| | 5. Discovery learning |
|---------------------|--|
| | 6. Field observation |
| | 7. Practice |
| | |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 3 credits = 3 x 45.33 hours |
| | = 136 hours |
| | Workload = 136 hours/ 30 hours = 4.53 ECTS |
| Credit points | 3 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to master the principles of agricultural cultivation |
| learning outcomes | technology in accordance with GAP |
| | |
| | Course Learning Outcomes |
| | 1. Able to determine the basic concepts of OPT |
| | management |
| | 2. Able to determine pest management methods on |
| | cultivated plants |
| | 3. Able to determine disease management methods in |
| | cultivated plants |
| | 4. Able to determine weed management methods in |
| | cultivation systems |
| | |

| | Lesson Learning Outcomes | | | | | | | |
|--|--|--|--|--|--|--|--|--|
| | 1. Able to master the basic concepts of OPT management | | | | | | | |
| | 2. Able to determine the type of plant pest and | | | | | | | |
| | management methods | | | | | | | |
| | 3. Able to determine the type of plant disease and | | | | | | | |
| | management methods | | | | | | | |
| | 4. Able to determine the type of plant weeds and | | | | | | | |
| | management methods | | | | | | | |
| Content | 1 The importance of past in agriculture | | | | | | | |
| | 2. Posts on Cultivated Crons | | | | | | | |
| | 2. Presis on Cultivated Crops | | | | | | | |
| | Diseases in Cultivated Crops Moods in Cultivated Crops | | | | | | | |
| | 4. Weeus in cultivated crops | | | | | | | |
| | nosthan/est | | | | | | | |
| | postilarvest | | | | | | | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes | | | | | | | |
| | | | | | | | | |
| requirements and forms of | | | | | | | | |
| requirements and forms of examination | | | | | | | | |
| requirements and forms of examination Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board | | | | | | | |
| requirements and forms of examination Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. Kalshoven, LGE, (1981). The Pest of Crops in Indonesia. | | | | | | | |
| requirements and forms of examination Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. Kalshoven, LGE, (1981). The Pest of Crops in Indonesia. Revised and Translated By PA Van der laan. Jakarta: PT. | | | | | | | |
| requirements and forms of examination Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. Kalshoven, LGE, (1981). The Pest of Crops in Indonesia. Revised and Translated By PA Van der laan. Jakarta: PT. Ichtiar Baru-Van Hoeve. | | | | | | | |
| requirements and forms of examination Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. Kalshoven, LGE, (1981). The Pest of Crops in Indonesia. Revised and Translated By PA Van der Iaan. Jakarta: PT. Ichtiar Baru-Van Hoeve. 2. Agrios, G. N. (2005). Introduction to plant pathology. | | | | | | | |
| requirements and forms of examination Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. Kalshoven, LGE, (1981). The Pest of Crops in Indonesia. Revised and Translated By PA Van der Iaan. Jakarta: PT. Ichtiar Baru-Van Hoeve. 2. Agrios, G. N. (2005). Introduction to plant pathology. Elsevier Academic Press Publications. | | | | | | | |
| requirements and forms of examination Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. Kalshoven, LGE, (1981). The Pest of Crops in Indonesia. Revised and Translated By PA Van der Iaan. Jakarta: PT. Ichtiar Baru-Van Hoeve. 2. Agrios, G. N. (2005). Introduction to plant pathology. Elsevier Academic Press Publications. 3. Fang, Y., & Ramasamy, R. (2015). Current and prospective | | | | | | | |
| requirements and forms of examination Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. Kalshoven, LGE, (1981). The Pest of Crops in Indonesia. Revised and Translated By PA Van der Iaan. Jakarta: PT. Ichtiar Baru-Van Hoeve. 2. Agrios, G. N. (2005). Introduction to plant pathology. Elsevier Academic Press Publications. 3. Fang, Y., & Ramasamy, R. (2015). Current and prospective methods for plant disease detection. Biosensors, 5(3), | | | | | | | |
| requirements and forms of examination Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board Kalshoven, LGE, (1981). The Pest of Crops in Indonesia. Revised and Translated By PA Van der Iaan. Jakarta: PT. Ichtiar Baru-Van Hoeve. Agrios, G. N. (2005). Introduction to plant pathology. Elsevier Academic Press Publications. Fang, Y., & Ramasamy, R. (2015). Current and prospective methods for plant disease detection. Biosensors, 5(3), 537-561. | | | | | | | |
| requirements and forms of examination Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. Kalshoven, LGE, (1981). The Pest of Crops in Indonesia. Revised and Translated By PA Van der Iaan. Jakarta: PT. Ichtiar Baru-Van Hoeve. 2. Agrios, G. N. (2005). Introduction to plant pathology. Elsevier Academic Press Publications. 3. Fang, Y., & Ramasamy, R. (2015). Current and prospective methods for plant disease detection. Biosensors, 5(3), 537-561. 4. Ray, M., Ray, A., Dash, S., Mishra, A., Achary, K. G., Nayak, | | | | | | | |

| | Traditional assays, novel diagnostic techniques and | | | | | |
|--------------------|---|--|--|--|--|--|
| | biosensors. Biosensors and Bioelectronics, 87, 708-723. | | | | | |
| | 5. McCartney, H. A., Foster, S. J., Fraaije, B. A., & Ward, E. | | | | | |
| | (2003). Molecular diagnostics for fungal plant pathogens. | | | | | |
| | Pest Management Science: formerly Pesticide Science, | | | | | |
| | 59(2), 129-142. 5. Bebber, D. P., & Gurr, S. J. (2015). Crop-destroying fungal | | | | | |
| | | | | | | |
| | and oomycete pathogens challenge food security. Fungal | | | | | |
| | Genetics and Biology, 74, 62-64. | | | | | |
| Date of amendement | 01 September 2022 | | | | | |

Module Handbook of Agroecology

| Designation module | Agriculture is part of an ecosystem, in which there are various |
|-----------------------------|--|
| | components, including humans, animals, plants and non-living |
| | components. To fulfill various life needs, humans use agricultural |
| | land by utilizing technology. The demands of various needs cause |
| | humans to exploit agriculture beyond their capabilities so that |
| | the agricultural system is damaged. This occurs as a result of a |
| | lack of understanding and internalization of the concept of |
| | sustainable agriculture among agricultural actors, including |
| | students. Agroecology learning generally aims to obtain an |
| | effective and efficient learning program based on students and |
| | containing soft skills with appropriate learning methods and |
| | media to achieve basic subject competencies, namely |
| | understanding the principles of nature and biodiversity and |
| | being able to manage natural balance in the agricultural system |
| | towards sustainable agriculture. In particular, this course will |
| | provide insight and experience about agricultural ecosystems, |
| | sustainable agriculture, diversity and social aspects of |
| | sustainable agriculture (cognitive), provide students with skills in |
| | identifying and analyzing agroecological problems and applying |
| | various forms of sustainable agricultural technology |
| | (psychomotor), and provide motivation and example for |
| | students to manage agriculture according to natural rules |
| | towards a sustainable (affective) agricultural system. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 126 |
| Semester(s) in which the | 2 |
| module is taught | |

| Person responsible for the | Ir. Agus Nugroho Setiawan, MP | | | | | |
|----------------------------|--|--|--|--|--|--|
| module | | | | | | |
| Lecturers | 1. Dr. Lis Noer Aini, SP, M.Sc. | | | | | |
| (Supporting lecturer) | 2. Dina Wahyu Trisnawati, SP, M.Agr., Ph.D. | | | | | |
| | 3. Ir. Agus Nugroho Setiawan, MP | | | | | |
| Language | Indonesian | | | | | |
| Relation to curriculum | Compulsory subjects for the 2nd Semester Agrotechnology Study | | | | | |
| | Program | | | | | |
| Type of teaching, contact | 1. Self-Directed Learning: Lecture, Brainstorming | | | | | |
| hours | 2. Cooperative Learning | | | | | |
| | 3. Field Study | | | | | |
| | 4. Contextual Instruction | | | | | |
| Workloads | 1 credit = 170 minutes x 16 meetings | | | | | |
| | = 2,720 minutes | | | | | |
| | = 45.33 hours | | | | | |
| | 3 credits = 3 x 45.33 hours | | | | | |
| | = 136 hours | | | | | |
| | Workload = 136 hours/ 30 hours = 4.53 ECTS | | | | | |
| Credit points | 3 | | | | | |
| Requirements | To pass the subject, the minimum attendance is 80% and collect | | | | | |
| | all the assignments given | | | | | |
| Recommended | | | | | | |
| prerequisites | | | | | | |
| Module | Learning Outcomes | | | | | |
| objectives/intended | Able to master the principles of natural resource management | | | | | |
| learning outcomes | and regional governance | | | | | |
| | | | | | | |
| | Course Learning Outcomes | | | | | |
| | 1. Able to understand the concept of agricultural system | | | | | |

| | dynamics and agricultural system diversity | | | | | |
|---------------------------|--|--|--|--|--|--|
| | 2. Able to analyze problems in the agricultural system | | | | | |
| | 3. Able to analyze the principles of sustainable agricultural | | | | | |
| | systems | | | | | |
| | Lesson Learning Outcomes | | | | | |
| | 1. Students are able to explain agroecology and t | | | | | |
| | dynamics of agricultural systems | | | | | |
| | 2. Students are able to analyze agroecosystems | | | | | |
| | 3. Students are able to analyze problems in agricultural | | | | | |
| | systems | | | | | |
| | 4. Able to analyze the principles of sustainable agricultural | | | | | |
| | systems | | | | | |
| Content | 1. Agroecology and agricultural system dynamics | | | | | |
| | 2. Diversity of agricultural systems | | | | | |
| | 3. Agricultural systems and problems | | | | | |
| | 4. Sustainable agriculture systems | | | | | |
| | 5. Organic farming system | | | | | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes | | | | | |
| requirements and forms of | | | | | | |
| examination | | | | | | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board | | | | | |
| Reading list | 1. Wezel, A., Bellon, S., Doré, T., Francis, C., Vallod, D., | | | | | |
| | David, C. (2009). Agroecology as a science, a movement | | | | | |
| | or a practice. A review. Agronomy for Sustainable | | | | | |
| | Development (published online) | | | | | |
| | 2. Wibblemann et al. (2013) Mainstreaming Agroecology: | | | | | |
| | Implications for Global Food and Farming Systems. | | | | | |
| | "Archived copy" (PDF). Archived from the original (PDF) | | | | | |
| | on 2016-05-22. Retrieved 05-19-2015. | | | | | |

| | - | |
|--------------------|--------|---|
| | 3. | Pretty, Jules. 2008. Agricultural sustainability: concepts, |
| | | principles and evidence. Philosophical Transactions of the |
| | | Royal Society, 363, 447-465. |
| | 4. | Francis; et al. (2003). "Agroecology: the ecology of food |
| | | systems". Journal of Sustainable Agriculture. 22(3): 99- |
| | | 118. doi:10.1300/J064v22n03_10. |
| | 5. | Conway, Gordon R. 1985. Agroecosystem analysis. |
| | | Agricultural Administration, 20, 31-55. Conway, Gordon |
| | | R. 1985. Agroecosystem analysis. Agricultural |
| | | Administration, 20, 31-55. |
| | 6. | Dalgaard, Tommy, and Nicholas Hutchings, John Porter. |
| | | "Agroecology, Scaling and Interdisciplinarity." Agriculture |
| | | Ecosystems and Environment 100(2003): 39-51. |
| | 7. | Wojtkowski, Paul A. (2002) Agroecological Perspectives in |
| | | Agronomy, Forestry and Agroforestry. Science Publishers |
| | | Inc., Enfield, NH, 356p. |
| | 8. | Wojtkowski, Paul A. (2006) Introduction to Agroecology: |
| | | Principles and Practices. Haworth Press, Binghamton, NY, |
| | | 404p. IFOAM (International Federation for Organic |
| | | Agriculture Movements |
| Date of amendement | 01 Sep | itember 2022 |

Module Handbook of Technology of Planting Materials

| Designation module | Planting Material Technology is a course to prepare students to | | | | | |
|-----------------------------|--|--|--|--|--|--|
| | be able to apply science and technology in the field of planting | | | | | |
| | material technology to obtain quality planting material. This | | | | | |
| | course studies the basic concepts of genetics and plant breeding | | | | | |
| | cells, chromosomes, DNA, genes, transcription and translatio | | | | | |
| | processes. This course also studies the provision of planting | | | | | |
| | material through vegetative and in vitro culture, conventional | | | | | |
| | and modern plant breeding methods as well as an introduction | | | | | |
| | to genetic transformation. Apart from that, we also study the | | | | | |
| | characteristics of quality seeds, seed production, seed drying, | | | | | |
| | seed processing, seed testing, seed storage and packaging, seed | | | | | |
| | certification and marketing. | | | | | |
| Module level, if applicable | Undergraduate | | | | | |
| Code, if applicable | KU 123 | | | | | |
| Semester(s) in which the | 2 | | | | | |
| module is taught | | | | | | |
| Person responsible for the | Ir. Sarjiyah, MS | | | | | |
| module | | | | | | |
| Lecturers | 1. Innaka Ageng Rineksane, SP, MP, Ph.D. | | | | | |
| (Supporting lecturer) | 2. Ir. Sarjiyah, MS | | | | | |
| | 3. Genesiska, S.Sc., M.Sc. | | | | | |
| Language | Indonesian | | | | | |
| Relation to curriculum | Compulsory subjects for the 2nd Semester Agrotechnology Study | | | | | |
| | Program | | | | | |
| Type of teaching, contact | 1. Lecture | | | | | |
| hours | 2. Self-Directed Learning | | | | | |
| | 3. Brainstorming | | | | | |
| | | | | | | |

| | 4. group discussion | | | | | |
|---------------------|---|--|--|--|--|--|
| | 5. Practice | | | | | |
| Workloads | 1 credit = 170 minutes x 16 meetings | | | | | |
| | = 2,720 minutes | | | | | |
| | = 45.33 hours | | | | | |
| | 4 credits = 4 x 45.33 hours | | | | | |
| | = 181.33 hours | | | | | |
| | Workload = 181.33 hours / 30 hours = 6.04 ECTS | | | | | |
| Credit points | 4 | | | | | |
| Requirements | To pass the subject, the minimum attendance is 80% and collect | | | | | |
| | all the assignments given | | | | | |
| Recommended | | | | | | |
| prerequisites | | | | | | |
| Module | Learning Outcomes | | | | | |
| objectives/intended | 1. Able to master the principles of agricultural cultivation | | | | | |
| learning outcomes | technology in accordance with GAP | | | | | |
| | 2. Able to apply technology in agricultural systems | | | | | |
| | | | | | | |
| | Course Learning Outcomes | | | | | |
| | 1. Be able to categorize genetics and its relationship to | | | | | |
| | plant breeding | | | | | |
| | 2. Able to reproduce planting material either throug | | | | | |
| | generative or vegetative propagation | | | | | |
| | 3. Able to carry out the seed production process in the | | | | | |
| | context of seed certification | | | | | |
| | | | | | | |
| | Lesson Learning Outcomes | | | | | |
| | 1. Able to categorize the role of cells as genetic material and | | | | | |
| | its relationship to Mendel's laws | | | | | |

| | 2. Able to prove plant breeding both conventionally and | | | | | | |
|---------------------------|--|--|--|--|--|--|--|
| | modernly | | | | | | |
| | 3. Able to propagate plants through generative propagat | | | | | | |
| | 4. Able to propagate plants through vegetative propagation | | | | | | |
| | 5. Able to carry out the seed production process sta | | | | | | |
| | from seed multiplication, drying, processing, testi | | | | | | |
| | storage and packaging | | | | | | |
| | 6. Able to certify horticultural seeds and food plants | | | | | | |
| Content | 1. Basic concepts of genetics and crop breeding (pollination | | | | | | |
| | and Mendel's law), cells, chromosomes, DNA and genes, | | | | | | |
| | transcription-translation processes | | | | | | |
| | 2. Provision of vegetative cropping material (grafting, grafts, | | | | | | |
| | cuttings, etc.); and provision of cropping material by in | | | | | | |
| | vitro culture | | | | | | |
| | 3. Conventional (cross) and modern crop breeding methods | | | | | | |
| | (in vitro culture and introduction of genetic | | | | | | |
| | transformation) | | | | | | |
| | 4. Seed Technology: Characteristics of quality seeds, seed | | | | | | |
| | production, drying, seed processing, seed testing, seed | | | | | | |
| | storage and packaging, seed certification, seed marketing | | | | | | |
| | marketing. | | | | | | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes | | | | | | |
| requirements and forms of | | | | | | | |
| examination | | | | | | | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board | | | | | | |
| Reading list | 1. Draper, J., R. Scott, P. Armitage, R. Walden. 1988. Plant | | | | | | |
| | Genetic Transformation and Gene Expression. Blackwell | | | | | | |
| | Scientific Publications. London. | | | | | | |
| | 2. George & Sherington. 1984. Plant Propagation by Tissue | | | | | | |

| | | Culture. | Handook | & | Dictionary | of | Commercial | |
|--------------------|--------|---|---------------|--------|----------------|--------|---------------|--|
| | | Laboratories. Exegetic Limited. Ngland. | | | | | | |
| | 3. | Kardinan, | A. 2001. | In V | itro Plant E | Breedi | ng. Canisius. | |
| | | Yogyakarta | a. | | | | | |
| | 4. | Kuswanto, H. 1996. Basics of technology, production and | | | | | | |
| | | seed certif | ication. | | | | | |
| | 5. | Mangoend | lidjojo, W. | 200 |)3. Basics o | of Pla | nt Breeding. | |
| | | Canisius. Y | ogyakarta | | | | | |
| | 6. | Crowder, L | V. (1986) | . Plar | nt Genetics. 1 | Fransl | ation. Gadjah | |
| | | Mada Univ | versity Pres | s. | | | | |
| | 7. | Gardner, E | E. J. (1992). | Prin | ciples of Gen | etics. | 7th ed. John | |
| | | Wiley & So | ons, Inc. Ne | w Yo | rk. | | | |
| Date of amendement | 01 Sep | tember 202 | 22 | | | | | |

Compulsory Courses

(3rd Semester)
Module Handbook of **Postharvest Physiology**

| Designation module | This Compulsory Course is aimed at developing an |
|-----------------------------|--|
| | understanding of the factors that influence the quality of fruit |
| | and vegetables and understanding how to maintain the quality |
| | of fruit and vegetables during the post-harvest period. These |
| | factors include physiological, biochemical, physical and |
| | compositional changes during cooking and maturation. |
| | Understand harvesting, preparation, packaging, transportation |
| | and storage procedures in relation to biological principles and |
| | commodity needs |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 341 |
| Semester(s) in which the | 3 |
| module is taught | |
| Person responsible for the | Ir. Nafi Ananda Utama, MS |
| module | |
| Lecturers | 1. Ir. Chandra Kurnia Setiawan, SP., M.Sc. |
| (Supporting lecturer) | 2. Ir. Sukuriyati Susilo Dewi, MS |
| | 3. Ir. Indira Prabasari, Ph.D. |
| | 4. Ir. Nafi Ananda Utama, MS |
| | |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the 3rd Semester Agrotechnology |
| | Study Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Discussion |
| | 3. Experiential Learning |
| Workloads | 6.04 ECTS |

| | 4 credits = 170 minutes X 16 meetings |
|----------------------------|---|
| | Workload = 181.33 hours / 30 hours |
| | = 6.04 ECTS |
| Credit points | 4 |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended prerequisites | |
| Module objectives/intended | Learning Outcomes |
| learning outcomes | Capable control principles of agricultural cultivation |
| | technology in accordance with GAP |
| | |
| | Course Learning Outcomes |
| | 1. Able to relate internal and external influences to post- |
| | harvest losses |
| | 2. Able to relate post-harvest physiological processes to |
| | shelf life |
| | Lesson Learning Outcomes |
| | 1. Able to relate environmental impacts to post-harvest |
| | losses |
| | 2. Able to demonstrate the process of post-harvest losses |
| | due to internal and external influences |
| | 3. Able to conceptualize the physiological processes of |
| | post-harvest products regarding shelf life |
| | 4. Able to calculate the rate of respiration under various |
| | environmental influences |
| Content | 1. Impact of pre harvest on post harvest |
| | 2. Post harvest damage |
| | 3. Respiration process |
| | 4. Physiological changes |

| Study and examination | Lectures, projects, self-study, assignments, quizzes |
|---------------------------|--|
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board |
| Reading list | Yahia, Elhadi. 2017. Postharvest Physiology and Biochemistry |
| | of Fruits and Vegetables. Woodhead Publishing. Mexico. |
| Date of amendement | 01 September 2022 |
| | |

Module Handbook of Postharvest Technology

| Designation module | Post-harvest Technology is "Science and Engineering" which is |
|-----------------------------|--|
| | applied to agricultural products after they are harvested for |
| | protection, conservation, processing, packaging, distribution, |
| | marketing and utilization to meet the food and nutritional needs |
| | of the community. Post-Harvest Technology needs to be |
| | developed in line with community needs to stimulate agricultural |
| | production; prevent post-harvest losses, improve nutrition and |
| | add product value. The Post-harvest Technology course is |
| | designed with the aim that students are able to apply post- |
| | harvest handling technology for agricultural products, both fruit, |
| | vegetables and cereals, to prepare products that suit market |
| | needs. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 342 |
| Semester(s) in which the | 3 |
| module is taught | |
| Person responsible for the | Ir. Sukuriyati Susilo Dewi, MS |
| module | |
| Lecturers | 1. Ir. Sukuriyati Susilo Dewi, MS |
| (Supporting lecturer) | 2. Ir. Indira Prabasari, Ph.D. |
| | 3. Ir. Nafi Ananda Utama, MS |
| | 4. Chandra Kurnia Setiawan, SP. MSc |
| | |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the 3rd Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture |

| hours | 2. Brainstorming |
|---------------------|--|
| | 3. Theory search |
| | 4. small group discussions |
| Workloads | 1 credits = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 4 credits = 4 x 45,33hours |
| | = 181.33 hours |
| | Workload = 181.33 hours / 30 hours = 6,04 ECTS |
| Credit points | 4 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to apply technology in agricultural systems |
| learning outcomes | |
| | Course Learning Outcomes |
| | 1 Able to demonstrate pre- and post-barvest technology to |
| | 1. Able to demonstrate pre- and post harvest technology to |
| | extend the shelf life of agricultural products COURSE |
| | extend the shelf life of agricultural products COURSEAble to formulate appropriate technological solutions |
| | extend the shelf life of agricultural products COURSE Able to formulate appropriate technological solutions that suit the type of agricultural product |
| | extend the shelf life of agricultural products COURSE Able to formulate appropriate technological solutions that suit the type of agricultural product Lesson Learning Outcomes |
| | a. Able to demonstrate pre- and post nurvest technology to extend the shelf life of agricultural products COURSE 2. Able to formulate appropriate technological solutions that suit the type of agricultural product Lesson Learning Outcomes 1. Able to demonstrate pre-harvest technology related to |
| | a. Able to demonstrate pre- and post-nurvest technology to extend the shelf life of agricultural products COURSE 2. Able to formulate appropriate technological solutions that suit the type of agricultural product Lesson Learning Outcomes 1. Able to demonstrate pre-harvest technology related to the shelf life of agricultural product |
| | a. Able to demonstrate pre-and post nurvest technology to extend the shelf life of agricultural products COURSE 2. Able to formulate appropriate technological solutions that suit the type of agricultural product Lesson Learning Outcomes 1. Able to demonstrate pre-harvest technology related to the shelf life of agricultural product 2. Able to demonstrate post-harvest technology related to the shelf life of agricultural product |
| | a. Able to demonstrate pre- and post nurvest technology to extend the shelf life of agricultural products COURSE 2. Able to formulate appropriate technological solutions that suit the type of agricultural product Lesson Learning Outcomes Able to demonstrate pre-harvest technology related to the shelf life of agricultural product Able to demonstrate post-harvest technology related to the shelf life of agricultural product |

| | system to extend the shelf life of agricultural |
|---------|---|
| | commodities |
| | 4. Able to demonstrate a food safety system |
| Content | 1. The importance of post-harvest handling |
| | 2. The technology used in postharvest handling |
| | 3. Manual harvesting |
| | 4. Effect of temperature on damage |
| | 5. Chilling injury |
| | 6. Principles of MAP |
| | 7. Gas mixing method |
| | 8. Combination with active packaging |
| | 9. Land transportation, sea transportation, air |
| | transportation |
| | 10. Sub-tropic fruit characteristics, Post-harvest handling |
| | procedures for subtropical fruit, 3. Post-harvest |
| | handling procedures for avocado/mango |
| | 11. Characteristics of cereal plant and nuts, Post-harvest |
| | technology for rice, Post-harvest handling technology for |
| | nuts. |
| | 12. Post-harvest technology for apples, Pear fruit post- |
| | harvest technology |
| | 13. Harvesting, field packing, packinghouse operations, |
| | cooling, recommend storage conditions |
| | 14. Quality control |
| | 15. HACCP |
| | 16. Package characteristics, product characteristics, cost |
| | analysis, packaging marketing aspects, laboratory testing |
| | analysis |
| | |

| Study and examination | Lectures, projects, self-study, assignments, quizzes |
|---------------------------|--|
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. MAP Modified Atmosphere Packaging Technology |
| | (Modified Atmosphere Packaging). Journal of Agricultural |
| | Postharvest Research. Agricultural Research and |
| | Development Agency. |
| | 2. Nugraha, S. 2012. Postharvest Technology Innovation to |
| | Reduce Yield Losses and Maintain Grain/Rice Quality at |
| | Farmer Level. Agricultural Postharvest Technology |
| | Bulletin 8 (1). Center for Agricultural Postharvest |
| | Research and Development. |
| Date of amendement | 01 September 2022 |

Module Handbook of English 3

| Designation module | |
|-----------------------------|--|
| Module level, if applicable | Undergraduate |
| Code, if applicable | |
| | |
| Semester(s) in which the | |
| module is taught | |
| Person responsible for the | |
| module (| |
| Lecturers | |
| (Supporting lecturer) | |
| Language | Indonesian |
| Relation to curriculum | |
| Type of teaching, contact | See the forms/learning strategies section in RPS |
| hours | |
| Workloads | |
| Credit points | |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | CLO (COURSE LEARNING OUTCOMES) and PLO |
| objectives/intended | |
| learning outcomes | |
| Content | Lesson Learning Outcomes |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |

| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
|----------------|--|
| Reading list | |
| | |

Module handbook of Problems on Water-Soil-Crop Relations

| Designation module | Problems on Water-Soil-Crop Relations, is one of the mandator |
|-----------------------------|--|
| | courses given in the UMY Agrotechnology study program. Thi |
| | course is designed to form competencies in the ability t |
| | identify, analyze and solve problems regarding the status an |
| | supply of water for plant metabolic processes. The characte |
| | that you want to build from this course is: Able to analyze an |
| | solve problems regarding the status and supply of water fo |
| | plant metabolic processes |
| Module level, if applicable | Undergraduate |
| | |
| Code if applicable | KU 231 |
| | KU 251 |
| | |
| Semester(s) in which the | 3 |
| module is taught | |
| Person responsible for the | Ir. Hariyono, MP |
| module | |
| Lecturers | 1. Ir. Hariyono, MP |
| (Supporting lecturer) | 2. Ir. Sukuriyati Susilo Dewi, MS |
| | 3. Ir. Mulyono, MP |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the 3rd Semester Agrotechnology |
| | Study Program |
| Type of teaching, contact | 1. Self-directed Learning |
| hours | 2. Observation |
| | 3. Group discussion forums |
| | |

| Workloads | 1 credits = 170 minutes x 16 meetings |
|---------------------|--|
| | = 2.720 minutes |
| | = 45,33hours |
| | 2 credits = 2 x 45,33hours |
| | = 90,67 hours |
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| Credit points | 2 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to solve agricultural problems |
| learning outcomes | Course Learning Outcomes |
| | 1. Able to pattern water availability and uptake |
| | 2. Able to pattern nutrient availability and uptake |
| | 3. Able to pattern water management |
| | Lesson Learning Outcomes |
| | 1. Able to explain problems related to the availability and |
| | uptake of AI |
| | 2. Able to draw appropriate conclusions in dealing with |
| | problems that arise in AI availability and uptake |
| | 3. Able to explain problems related to nutrient availability |
| | and uptake |
| | 4. Able to draw appropriate conclusions in dealing with |
| | problems that arise in the availability and uptake of |
| | nutrients |
| | 5. Able to explain problems related to water management |
| | 6. Able to draw appropriate conclusions in dealing with |

| | problems that arise in Water Management |
|--|--|
| Content | 1. Problems of water availability in soil (hydrological cycle, |
| | soil texture and structure, water status) |
| | 2. Nutrient availability problems (chemical and biological |
| | properties) |
| | 3. Water uptake and transport problems and nutrients |
| | 4. Water management problems (irrigation and drainage) |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| | |
| | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. http://library.um.ac.id/free- |
| Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. http://library.um.ac.id/free- contents/index.php/buku/detail/hubungan-air-tanah- |
| Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. http://library.um.ac.id/free- contents/index.php/buku/detail/hubungan-air-tanah- dan-tanaman-titiek-islami-26703.html |
| Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. http://library.um.ac.id/free-contents/index.php/buku/detail/hubungan-air-tanah-dan-tanaman-titiek-islami-26703.html 2. https://search7.com/search.php?q=hubungan%20air,% |
| Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. http://library.um.ac.id/free-contents/index.php/buku/detail/hubungan-air-tanah-dan-tanaman-titiek-islami-26703.html 2. https://search7.com/search.php?q=hubungan%20air,% 20tanah%20dan%20tanaman |
| Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. http://library.um.ac.id/free-contents/index.php/buku/detail/hubungan-air-tanah-dan-tanaman-titiek-islami-26703.html 2. https://search7.com/search.php?q=hubungan%20air,%20tanah%20dan%20tanaman 3. https://slideplayer.info/slide/3665430/ |
| Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. http://library.um.ac.id/free-contents/index.php/buku/detail/hubungan-air-tanah-dan-tanaman-titiek-islami-26703.html 2. https://search7.com/search.php?q=hubungan%20air,% 20tanah%20dan%20tanaman 3. https://slideplayer.info/slide/3665430/ 4. https://search7.com/search.php?q=hubungan%20air,% |
| Media employed Reading list | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. http://library.um.ac.id/free-contents/index.php/buku/detail/hubungan-air-tanah-dan-tanaman-titiek-islami-26703.html 2. https://search7.com/search.php?q=hubungan%20air,% 20tanah%20dan%20tanaman 3. https://slideplayer.info/slide/3665430/ 4. https://search7.com/search.php?q=hubungan%20air,% 20tanah%20dan%20tanaman |
| Media employed Reading list Date of amendement | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board 1. http://library.um.ac.id/free- contents/index.php/buku/detail/hubungan-air-tanah- dan-tanaman-titiek-islami-26703.html 2. https://search7.com/search.php?q=hubungan%20air,% 20tanah%20dan%20tanaman 3. https://slideplayer.info/slide/3665430/ 4. https://search7.com/search.php?q=hubungan%20air,% 20tanah%20dan%20tanaman 01 September 2022 |

Module handbook of Problems on Modification of Crop Production

| Designation module | The Plant Cultivation Engineering Problems course is a |
|-----------------------------|---|
| | compulsory course with 2/2 credits. The aim of this |
| | course is to provide the ability to identify, analyze, |
| | formulate and solve problems in sustainable plant |
| | cultivation engineering. Learning will be carried out using |
| | a Problem Based Learning strategy, with case studies |
| | prepared or identified through field observations. The |
| | teaching and learning process (PBM) activities for the |
| | PRBT course are not only tutorials in class, but also |
| | include assignments such as observations, group |
| | discussions, presentations and, preparation of papers, |
| | both off-line and on-line. The results of assignments |
| | completed by students must be uploaded to e-learning. |
| Module level, if applicable | Undergraduate |
| | |
| Code, if applicable | KU 233 |
| | |
| Semester(s) in which the | 3 |
| module is taught | |
| Person responsible for the | Ir. Sarjiyah. M.Sc |
| module | |
| Lecturers | 1. Ir. Sarjiyah. M.S |
| | 2. Ir. Titiek Widyastuti, MS |
| | 3. Innaka Ageng Rineksane, SP, MP, Ph.D |
| Language | Indonesian |
| Relation to curriculum | Compulsory Agrotechnology Course Semester 3 |
| | |

| Type of teaching, contact | 1. Self-directed Learning |
|---------------------------|--|
| hours | 2. Observation |
| | 3. Group discussion forums |
| | |
| Workloads | 1 credits = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 4 credits = 4 x 45,33hours |
| | = 181.33 hours |
| | Workload = 181.33 hours / 30 hours = 6,04 ECTS |
| Credit points | 4 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcome |
| objectives/intended | Able to solve agricultural problems |
| learning outcomes | Course learning Outcomes |
| | 1. Able to overcome problems that arise during pre- |
| | planting in the agricultural production series |
| | 2. Able to overcome problems that arise during post- |
| | planting in the agricultural production series |
| | Lesson Learning Outcomes |
| | 1. Able to overcome problems in aspects of planting |
| | materials, land preparation, as well as planting and |
| | cropping systems |
| | 2. Able to overcome problems in aspects of pest |
| | control, plant maintenance as well as harvest and |
| | post-harvest. |

| Content | 1. Soil processing (land preparation) |
|---------------------------|--|
| | 2. Preparation of cropping material |
| | 3. Cropping and cropping systems |
| | 4. Crop maintenance |
| | 5. Crop protection |
| | 6. Post-harvest |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board |
| Reading list | 1. Copeland, L.O. 1986. Principle of Seed Science and |
| | Technology. Burgess Publishing Company, |
| | Minneapolis, Minnesota, USA. |
| | 2. Leopold and Kriedman. 1981. Plant Growth and |
| | Development. |
| | 3. Heddy, S., W.H. Susanto, dan M. Kurniati, 1994. |
| | Pengantar Produksi dan Penanganan Pasca Panen. |
| | Raja Grafindo Persada. Jakarta. |
| | 4. Palaniappan. 1985. Cropping Systems in The |
| | Tropics. Wiley Estern Limited. New Delhi. |
| | 5. Salisbury, F.B. and C.W. Ross.1995. Plant |
| | Physiology. Terjemahan Diah dan Sumaryono. ITB, |
| | Bandung. |
| | 6. Supriyadi, A. dan T. Widyastuti, 2014. Organisme |
| | Pengganggu Tanaman dan Pengendaliannya. LP3M |
| | UMY. Yogyakarta |
| | 7. Widyastuti, T., 2017. Teknologi Budidaya dan |
| | Agribisnis Tanaman Hias. CV Min. Yogyakarta. |

| | 8. Williams. 1982. The Agronomy of The Major |
|-------------------|--|
| | Tropical Crops. |
| | 9. Williams, C.N. and K.T. Joseph, 1970. Climate, Soil |
| | and Crop Production in The Humid Tropics. Oxford |
| | University Press. Singapore. |
| | 10. Yayock et.al. 1988. Crop Science and Production in |
| | Warm Climates |
| Date of amendment | 01 September 2022 |
| | |

Module handbook of Problems on Agroecosystem

| Designation module | Agriculture is a system of means of producing biomass (food, |
|--------------------|---|
| | clothing and shelter) which is widely influenced by the |
| | environmental quality conditions where the plants grow. |
| | AGROECOSYSTEM is an ecosystem needed in the biomass |
| | production process. AGROECOSYSTEM can also be defined as |
| | populations of plants and animals that interact with each other |
| | in a physical, chemical and biological environment that can |
| | produce sources of food, fiber, fuel and other forms of |
| | biomass products that can be further processed by humans. |
| | The main elements in an agroecosystem are the resilience, |
| | evenness and sustainability of the ecosystem in a production |
| | process. The decline in the quality of agroecosystems, whether |
| | caused by policy errors, low levels of farmer knowledge, |

| | environmental damage caused by humans or natural disasters, |
|---------------------------|---|
| | are AGROECOSYSTEM PROBLEMATICS that must be included in |
| | every regional development plan. Therefore, development |
| | from an agroecosystem perspective and an agrarian country |
| | (such as Indonesia) will always seek to link the environment, |
| | culture, economy, social type and local agricultural model. |
| Module level, if | Undergraduate |
| applicable | |
| Code, if applicable | KU 232 |
| Semester(s) in which the | 3 |
| module is taught | |
| Person responsible for | Dr. Ir. Lis Noer Aini, SP, M.Sc. |
| the module | |
| Lecturers | 1. Dr. Lis Noer Aini, SP, M.Sc. |
| (Supporting lecturer) | 2. Prof. Dr. Ir. Gunawan Budiyanto, MP |
| | 3. Dina Wahyu Trisnawati, SP, M.Agr., Ph.D |
| Language | Indonesian |
| Relation to curriculum | Compulsory Agrotechnology Course Semester 3 |
| Type of teaching, contact | 1. Self-directed Learning |
| hours | 2. Cooperative Learning |
| Workloads | 1 credits = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 2 credits = 2 x 45,33hours |
| | = 90,67 hours |
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| Credit points | 2 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and |

| | collect all the assignments given |
|---------------------|--|
| Recommended | |
| prerequisites | |
| Module | Learning Outcome |
| objectives/intended | Able to solve agricultural problems |
| learning outcomes | Course Learning Outcome |
| | 1. Able to overcome environmental problems and solutions |
| | in the agricultural ecosystem |
| | 2. Able to show the relationship between climate change |
| | and its consequences on agroecosystems |
| | 3. Able to overcome land degradation carried out |
| | systematically and logically in accordance with applicable |
| | regulations |
| | 4. Able to carry out agroecosystem management and solve |
| | problems within it |
| | Lesson Learning Outcome |
| | 1. Able to overcome existing problems in agroecosystems |
| | 2. Able to show the relationship between problems in |
| | changes and their consequences on agroecosystems |
| | 3. Being able to overcome the problem of environmental |
| | degradation is communicated effectively for the benefit |
| | of humans |
| | 4. Able to carry out agroecosystem management and solve |
| | problems within it and communicate effectively in |
| | accordance with applicable regulations |
| Content | 1. Crop, soil and ecosystem relationship |
| | 2. Climate change and agroecosystem |
| | 3. Environmental degradation |
| | 4. Agroecosystem technology management |

| Study and examination | Lectures, projects, self-study, assignments, quizzes |
|------------------------|--|
| requirements and forms | |
| of examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board |
| Reading list | 1. http://hortikultura.litbang.pertanian.go.id/Modul%20PT |
| | T/Bawang Merah/Agroekosistem.pdf |
| | 2. https://www.socla.co/wp-content/uploads/2014/socla- |
| | contribution-to-FAO.pdf |
| | 3. https://www.academia.edu/Documents/in/Ecological_a |
| | nd_Environment_problems_of_agroecosystem |
| Date of amendment | 01 September 2022 |

Module handbook of Management of Natural Resources

| Designation module | Understanding the term natural resources refers to all |
|-----------------------------|--|
| | materials (both physical and non-physical) that are useful for |
| | humans. Physical natural resources are usually related to |
| | human needs to fulfill human needs, while non-physical |
| | natural resources are related to the spiritual quality of human |
| | life, the psychological atmosphere and human will. The limits |
| | of understanding natural resources come from the ability of |
| | creativity, initiative and work of a civilization. It may be that in |
| | the past the benefits of the materials in the biosphere were |
| | not/were not yet known, and had not yet become natural |
| | resources, but with the increasing demands of humans on |
| | nature's services, and the progress of human creativity, |
| | initiative and work, these materials became useful for |
| | humans, and thus turned into natural resources. The Natural |
| | Resources Management course aims to enable students to |
| | understand the importance of natural resources for humans |
| | and the sustainability of human life, as well as understanding |
| | the basic concepts of natural resource management in order |
| | to achieve ecological balance in the biosphere. |
| Module level, if applicable | Undergraduate |
| Codo if continents | KU 425 |
| Code, if applicable | KU 135 |
| | |
| Semester(s) in which the | 3 |
| module is taught | |
| Person responsible for the | Dr. Ir. Lis Noer Aini, SP, M.Sc. |
| module | |

| Lecturers | 1. Dr. Ir. Lis Noer Aini, SP, M.Sc. |
|---------------------------|--|
| | 2. Prof. Dr. Ir. Gunawan Budiyanto, MP |
| Language | Indonesian |
| Relation to curriculum | Compulsory Agrotechnology Course Semester 3 |
| Type of teaching, contact | 1. Self-directed Learning |
| hours | 2. Discovery Learning |
| | 3. Small group discussions |
| | 4. Experience-based learning |
| Workloads | 1 credits = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 3 credits = 3 x 45,33hours |
| | = 136 hours |
| | Workload = 136 hours/ 30 hours = 4,53 ECTS |
| Credit points | 3 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended | |
| prerequisites | |

| Module | Learning Outcome |
|---------------------|--|
| objectives/intended | 1. Able to master the principles of natural resource |
| learning outcomes | management and regional planning |
| | 2. Able to solve agricultural problems |
| | Course Learning Outcome |
| | 1. Able to understand natural resource components as |
| | agroecosystem assets |
| | 2. Able to analyze problems in natural resource |
| | management logically and systematically |
| | 3. Able to manage natural resources and integrate in |
| | sustainable development |
| | Lesson Learning Outcome |
| | 1. Students can explain the parts of planet Earth and |
| | natural cycles, their relationship as natural resources |
| | 2. Students are able to explain natural resources and |
| | social/cultural resources as part of nature |
| | 3. Students are able to carry out climate element analysis |
| | as part of natural resource management |
| | 4. Students are able to analyze problems that arise in |
| | natural resource management |
| | 5. Students are able to manage natural resources |
| | 6. Students are able to integrate natural resource |
| | management as part of sustainable development |
| Content | 1. Planet earth and natural cycles |
| | 2. Unrenewable and renewable natural resources |
| | 3. Social / cultural resources |
| | 4. Natural resource management |
| | 5. Natural resources and sustainable development |

| Study and examination | Lectures, projects, self-study, assignments, quizzes |
|------------------------|--|
| requirements and forms | |
| of examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board |
| Reading list | 1. https://www.slideserve.com/victor-moody/sistem- |
| | alam-semesta |
| | 2. https://www.researchgate.net/publication/281240926_ |
| | Natural_Resource |
| | Management_and_Biodiversity_Conservation_in_the_D |
| | rylands_of_Easte n_and_Central_Africa |
| | 3. http://library.um.edu.mo/ebooks/b28112672.pdf |
| | https://ejournal.undip.ac.id/index.php/politika/article/v |
| | <u>iewFile/4864/4412</u> |
| | 4. https://www.researchgate.net/publication/323384269_ |
| | KONSEP_PENGELOLAAN_LINGKUNGAN_DAN_PERTANIA |
| | N_YANG_BERKELANJUTAN_DI_INDONESIA |
| Date of amendement | 01 September 2022 |
| | |

Compulsory Courses

(4th Semester)

Module Handbook of Isolation and Cultivation Technique of Biological Agents

| Designation module | Isolation Techniques for the Propagation of Biological Agents |
|-----------------------------|---|
| | (TIPA) (KP 421) is a course to prepare students to master the |
| | technology of isolation and propagation of biological agents in |
| | order to study the application of biotechnology in the field of |
| | industrial activities and agricultural business. This course |
| | studies the methods and techniques for isolating and |
| | multiplying biological agents used in the production of |
| | biological fertilizers, biopesticides and plant engineering. To |
| | study this course, students must have an understanding of the |
| | principles of management of microorganisms, land and |
| | biological resources. This course is very important for |
| | introducing technology in the post-harvest field and is very |
| | useful in implementing and developing innovative businesses |
| | in the field of plant cultivation technology. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KP 241 |
| Semester(s) in which the | 4 |
| module is taught | |
| Person responsible for the | Dr. Siti Nur Aisyah, SP |
| module | |
| Lecturers | 1. Ir. Agung Astuti, M.Sc. |
| | 2. Ir. Mulyono, MP |
| | 3. Dr. Innaka Ageng Rineksane, SP, MP |
| | 4. Dr. Siti Nur Aisyah, SP |
| Language | Indonesian |
| Relation to curriculum | Compulsory subjects for the 4th Semester Agrotechnology |
| | Study Program |

| Type of teaching, contact | 1. Lecture |
|----------------------------|--|
| hours | 2. Self-directed learning: |
| | 3. Brainstorming |
| | 4. Discovery learning |
| | 5. Small group discussions |
| | 6. Laboratory experiments |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 4 credits = 4 x 45.33 hours |
| | = 181.33 hours |
| | Workload = 181.33 hours / 30 hours = 6.04 ECTS |
| Credit points | 4 |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended prerequisites | |
| Module objectives/intended | Learning Outcomes |
| learning outcomes | Able to apply technology in agricultural systems |
| | Course Learning Outcomes |
| | 1. Able to apply isolation and multiplication techniques |
| | for biological fertilizer agents correctly |
| | 2. Able to apply appropriate isolation and multiplication |
| | techniques for biopesticide agents |
| | 3. Able to apply plant engineering methods to improve |
| | plant quality |
| | 4. Able to study the application of isolation and |
| | |
| | multiplication techniques for biological agents for |
| | multiplication techniques for biological agents for large-scale production |

| Lesso | n Learning Outcomes |
|-----------------------------|--|
| 1 | . Able to carry out isolation and multiplication of |
| | biological fertilizer agents |
| 2 | Able to carry out isolation and multiplication of |
| | biopesticide agents |
| 3 | Able to carry out genetic modification to improve plant |
| | quality |
| 4 | Able to analyze biological agent multiplication |
| | procedures for industrial scale |
| | |
| Content 1 | . Inoculum development to modern biological fertilizer |
| | biotechnology; population of soil microorganisms and |
| | soil fertility; biogeochemical cycle; the role of biological |
| | agents in the nutrient cycle |
| 2 | . Decomposition of organic matter; symbiotic and non- |
| | symbiotic nitrogen fixation; phosphorous |
| | transformation in soil by microbes; role of rhizobacteria |
| | in drought stress and plant growth regulator. |
| 3 | . Biological control; biological control agents; natural |
| | enemies |
| 4 | . Biological control fungi; biological control bacteria; |
| | biological control viruses; biological control weeds; |
| | biological control vegetable extract |
| 5 | . GMO; Gene cloning |
| 6 | . PCR; Transformation of genes into bacteria; |
| | Propagation of plasmids in bacteria |
| 7 | . Isolates & biopesticides and biofertilizer products; GMO |
| | Products |
| Study and examination Lectu | res, projects, self-study, assignments, quizzes |

| requirements and forms of | |
|---------------------------|---|
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board |
| Reading list | Main References: |
| | 1. Riaz, U., Murtaza, G., Anum, W., Samreen, T., Sarfraz, |
| | M., & Nazir, M. Z. (2021). Plant Growth-Promoting |
| | Rhizobacteria (PGPR) as biofertilizers and biopesticides. |
| | Microbiota and biofertilizers: a sustainable continuum |
| | for plant and soil health, 181-196. |
| | 2. Dhir, B. (2017). Biofertilizers and biopesticides: eco- |
| | friendly biological agents. Advances in environmental |
| | biotechnology, 167-188. |
| | 3. Pathak, D. V., & Kumar, M. (2016). Microbial inoculants |
| | as biofertilizers and biopesticides. Microbial Inoculants |
| | in Sustainable Agricultural Productivity: Vol. 1: |
| | Research Perspectives, 197-209. |
| | 4. Raman, R. (2017). The impact of Genetically Modified |
| | (GM) crops in modern agriculture: A review. GM crops |
| | & food, 8(4), 195-208. |
| | 5. Van Esse, H. P., Reuber, T. L., & van der Does, D. (2020). |
| | Genetic modification to improve disease resistance in |
| | crops. New Phytologist, 225(1), 70-86. |
| | 6. Arora, L., & Narula, A. (2017). Gene editing and crop |
| | improvement using CRISPR-Cas9 system. Frontiers in |
| | plant science, 8, 1932. |
| | 7. Georges, F., & Ray, H. (2017). Genome editing of crops: |
| | a renewed opportunity for food security. GM Crops & |
| | Food, 8(1), 1-12. |

| 8. | Abdallah, N.A., Prakash, C.S., & McHughen, A.G. (2015). |
|-------|--|
| | Genome editing for crop improvement: challenges and |
| | opportunities. GM Crops & Food, 6(4), 183-205. |
| 9. | Yadav, A.K., & Chandra, K. (2014). Mass production and |
| | quality control of microbial inoculants. In Proc Indian |
| | Natn Sci Acad (Vol. 80, No. 2, pp. 483-489). |
| | |
| Suppo | rting References: |
| 1. | Seenivasagan, R., & Babalola, O.O. (2021). Utilization of |
| | microbial consortia as biofertilizers and biopesticides |
| | for the production of feasible agricultural products. |
| | Biology, 10(11), 1111. |
| 2. | Roychowdhury, D., Paul, M., & Banerjee, S. K. (2014). A |
| | review on the effects of biofertilizers and biopesticides |
| | on rice and tea cultivation and productivity. |
| | International Journal of Science, Engineering and |
| | Technology, 2(8), 96-105. |
| 3. | Rajput, M., Vivekanand, V., & Pareek, N. (2021). |
| | Biofertilizers and Biopesticides: A Whole New |
| | Dimension for Ameliorating Soil Fertility and Organic |
| | Agriculture Practice. Plants, Soil and Microbes in |
| | Tropical Ecosystems, 369-389. |
| 4. | Rajput, M., Choudhary, K., Kumar, M., Vivekanand, V., |
| | Chawade, A., Ortiz, R., & Pareek, N. (2021). RNA |
| | interference and CRISPR/Cas gene editing for crop |
| | improvement: Paradigm shift towards sustainable |
| | agriculture. Plants, 10(9), 1914. |
| 5. | Vassilev, N., Vassileva, M., Lopez, A., Martos, V., Reyes, |
| | A., Maksimovic, I., & Malusa, E. (2015). Unexploited |
| | 8. 9. Suppo 1. 2. 3. 4. 5. |

| | potential of some biotechnological techniques for |
|--------------------|--|
| | biofertilizer production and formulation. Applied |
| | Microbiology and Biotechnology, 99, 4983-4996. |
| | 6. Chittora, D., Meena, M., Barupal, T., Swapnil, P., & |
| | Sharma, K. (2020). Cyanobacteria as a source of |
| | biofertilizers for sustainable agriculture. Biochemistry |
| | and biophysics reports, 22, 100737. |
| | |
| Date of Amandement | 01 September 2022 |

Module Handbook of Production and Formulation Technique of Biofarming

| Designation module | Biofarming Formulation & Production Techniques (TFPB) (KP |
|-----------------------------|---|
| | 422). This course is intended to prepare students to master |
| | Biofarming Formulation and Production Technology to study the |
| | application of biotechnology in the field of industrial activities |
| | and agricultural business. This course studies various ways of |
| | formulating biological agents as commercial biofertilizers and |
| | biopesticides, as well as producing biofertilizers and |
| | biopesticides used in industrial and agricultural businesses. To |
| | study this course students must have an understanding of the |
| | principles of microorganism management, isolation and |
| | multiplication techniques of biological agents, land and biological |
| | resources. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KP 242 |
| Semester(s) in which the | 4 |
| module is taught | |
| Person responsible for the | Ir. Agung Astuti, M.Sc. |
| module | |
| Lecturers | 1. Ir. Agung Astuti, M.Sc. |
| | 2. Ir. Mulyono, MP |
| | 3. Dr. Innaka Ageng Rineksane, SP, MP |
| | 4. Dr. Siti Nur Aisyah, SP |
| Language | Indonesian |
| Relation to curriculum | Compulsory subjects for the 4th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Small Group Discussion |

| | 3. Practice | |
|---------------------|--|--|
| Workloads | 1 credit = 170 minutes x 16 meetings | |
| | = 2,720 minutes | |
| | = 45.33 hours | |
| | 4 credits = 4 x 45.33 hours | |
| | = 181.33 hours | |
| | Workload = 181.33 hours / 30 hours = 6.04 ECTS | |
| Credit points | 4 | |
| Requirements | To pass the subject, the minimum attendance is 80% and collect | |
| | all the assignments given | |
| Recommended | | |
| prerequisites | | |
| Module | Learning Outcomes | |
| objectives/intended | Able to apply technology in agricultural systems | |
| learning outcomes | Course Learning Outcomes | |
| | 1. Able to develop and apply biological fertilizer products | |
| | 2. Able to develop and apply Biopesticide products | |
| | 3. Able to develop transgenic plants | |
| | 4. Able to design Biofarming Products using active | |
| | ingredients from Biological Agents or transgenic plants | |
| | Lesson Learning Outcomes | |
| | 1. Master the principles of bioprospecting and be able to | |
| | develop biofertilizer product formulations and apply | |
| | them in agricultural systems | |
| | 2. Master the principles of bioprospecting and be able to | |
| | develop Bioprotection product formulations and apply | |
| | them in agricultural systems | |
| | 3. Master the principles of bioprospecting and be able to | |
| | develop transgenic plants and apply them in agricultural | |

| | systems |
|---------------------------|--|
| | 4. Able to design labels and packaging for Biofarming |
| | Products with active ingredients from Biological Agents or |
| | GMO plants |
| Content | 1. Inoculum development; Carrier medium; Formula (liquid, |
| | pellet, granule, powder etc.); Product packaging |
| | 2. Production of activator & compost (POP), POC; Nitrogen |
| | Fixation Inoculum Production (Symbiotic and non- |
| | symbiotic); Phosphate solvent inoculum production; |
| | Production of rhizobacterial inoculum |
| | 3. Inoculum development (carrier medium, product formula |
| | and packaging) |
| | 4. Fungal biopesticide products; Bacterial biopesticide |
| | products; Vegetable biopesticide products for fungi, |
| | bacteria and insects |
| | 5. Crop transformation |
| | 6. Expression of resistance genes; GMO production and |
| | detection |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | Main References: |
| | 1. Prescott et al. 2000. Microbiology |
| | 2. Brock. 1988. Biology of Microorganisms |
| | 3. Ingold, CT & HJ Hudson. 1993. The Biology of Fungi. |
| | Chapman & Hall. |
| | 4. Ratna Siri et al. 1982. Basics of Microbiology |
| | 5. Tortora et al. 2007. Microbiology An Introduction. |

| | Pearson Int'l Edition. |
|--------------------|--|
| | 6. Mantell, Mathews and McHee. 1985. Principles of plant |
| | Biotechnology. London |
| | 7. Sardjoko. 1991. Biotechnology. Scholastic. Jakarta |
| | |
| | Supporting References: |
| | 1. Journals of Plant Biotechnology |
| Date of Amandement | 01 September 2022 |

Module Handbook of Research Methodology

| Designation module | This course explains the basic principles of scientific activities, | | |
|-----------------------------|---|--|--|
| | preparation and preparation of research proposals and how to | | |
| | write research reports and other scientific writing. | | |
| Module level, if applicable | Undergraduate | | |
| Code, if applicable | KU 442 | | |
| | | | |
| Semester(s) in which the | 4 | | |
| module is taught | | | |
| Person responsible for the | Ir. Agung Astuti, MSi. | | |
| module | | | |
| Lecturers | 1. Prof. Dr. Ir. Gunawam Budiyanto, MP. HDI. | | |
| | 2. Dr. Ir. Lis Noer Aini, SP.MSi. | | |
| | 3. Ir. Agung Astuti, MSi. | | |
| Language | Indonesian | | |
| Relation to curriculum | Compulsory subjects for the 4th Semester Agrotechnology Study | | |
| | Program | | |
| Type of teaching, contact | 1. Self Directed Learning: Lecture, | | |
| hours | 2. Brainstorming | | |
| | 3. Small Group Discussion | | |
| | 4. Discussion and Presentation | | |
| Workloads | 1 credit = 170 minutes x 16 meetings | | |
| | = 2,720 minutes | | |
| | = 45.33 hours | | |
| | 2 credits = 2 x 45.33 hours | | |
| | = 90.67 hours | | |
| | Workload = 90.67 hours / 30 hours = 3.02 ECTS | | |
| Credit points | 2 | | |

| Requirements | To pass the subject, the minimum attendance is 80% and collect |
|---------------------|--|
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | 1. Able to master the principles of the scientific method |
| learning outcomes | 2. Able to solve agricultural problems |
| | Course Learning Outcomes |
| | 1. Able to understand philosophy and master the basic |
| | principles of scientific methods in research |
| | 2. Able to complete research proposals according to |
| | scientific principles |
| | 3. Able to design and evaluate research |
| | Lesson Learning Outcomes |
| | 1. Able to formulate research problems |
| | 2. Able to master observational and experimental research |
| | 3. Able to create research designs and determine variables |
| | from phenomena in research |
| | 4. Able to complete research proposals according to |
| | scientific principles |
| | 5. Able to carry out library searches and citations |
| | 6. Able to interpret research results and present research |
| | results in a scientific work |
| Content | 1. The phenomenon, problem statement and problem |
| | formulation |
| | 2. Observative and experimental research, descriptive |
| | methods, explanative, comparative |
| | 3. Empirical reasoning; various models and processes of |
| | causality; independent and dependent variables; pattern |
| | of relationship between variables (simple regression and |
|---------------------------|--|
| | multiple regression); SPSS |
| | 4. Thesis preparation guide; Observational and |
| | experimental research; Determination of research |
| | methods and sampling methods; Observation design and |
| | treatment design; Experimental design and |
| | environmental design; SPSS and SAS. |
| | 5. Research management and job security |
| | 6. Papers, Powerpoints, journal articles and posters |
| | 7. An understanding of observational and/or experimental |
| | research |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | Main References: |
| | 1. Gunawan AW, EH Nugraheni, L Arianti, M Rachmaniah, R |
| | Boer, Siswadi, SS Achmadi, 1996. Guidelines for |
| | Presenting Scientific Work. Faculty of Mathematics and |
| | Natural Sciences. IPB. Bogor. 59 p. |
| | 2. NasutionS and Thomas M., 2000. Theses, theses, |
| | dissertations, papers. Literary Earth. Jakarta. 120 p. |
| | 3. Natsir, 1996. Research Methods. Scholastic. Jakarta. 688 |
| | р. |
| | 4. Saifuddin A. 2001. Research Methods. Student Library. |
| | Yogyakarta. 146 p |
| | 5. TejoyuwonoN. 1985. Research Methods and Scientific |
| | Communication. UGM |
| | Supporting References: |

| | 1. | UMY | Agrotechnology | Team, | 2019. | Thesis | Writing |
|--------------------|--------|--------|----------------------|----------|----------|----------|---------|
| | | Guide | lines. UMY Faculty | of Agric | ulture A | grotechr | ology. |
| | 2. | Variou | us Scientific Journa | ls | | | |
| Date of Amandement | 01 Sep | otembe | r 2022 | | | | |

Module Handbook of Statistics

| Designation module | The Agricultural Statistics course is a mandatory course that |
|-----------------------------|---|
| | discusses research design, survey methods and experimental |
| | methods in agricultural research, types of data distribution, |
| | data analysis, and data problems and how to overcome them. |
| | Apart from that, various types of further tests and group |
| | comparisons (Orthogonal Contrast) are also studied as well as |
| | how to interpret data. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 343 |
| Semester(s) in which the | 4 |
| module is taught | |
| Person responsible for the | Dr. Ihsan Nurkomar, SP |
| module | |
| Lecturers | 1. Dina Wahyu Trisnawati, SP, M.Agr., Ph.D. |
| | 2. Taufiq Hidayat, SP, M.Sc. |
| | 3. Dr. Ihsan Nurkomar, SP |
| Language | Indonesian |
| Relation to curriculum | Compulsory subjects for the 4th Semester Agrotechnology |
| | Study Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Small Group discussions |
| | 3. Discovery learning |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 3 credits = 3 x 45.33 hours |
| | = 136 hours |

| | Workload = 136 hours/ 30 hours = 4.53 ECTS | | |
|----------------------------|---|--|--|
| Credit points | 3 | | |
| Requirements | To pass the subject, the minimum attendance is 80% and | | |
| | collect all the assignments given | | |
| Recommended prerequisites | | | |
| Module objectives/intended | Learning Outcomes | | |
| learning outcomes | Able to master the principles of the scientific method | | |
| | Course Learning Outcomes | | |
| | 1. Able to understand the basic concepts of agricultural | | |
| | statistics | | |
| | 2. Able to design, analyze and evaluate research in the | | |
| | agricultural sector | | |
| | Lesson Learning Outcomes | | |
| | 1. Able to understand the basic concepts of agricultural | | |
| | statistics and descriptive statistics | | |
| | 2. Able to create research hypotheses in the agricultural | | |
| | sector | | |
| | 3. Able to examine the relationship between two | | |
| | variables through correlation and regression analysis | | |
| | 4. Able to choose appropriate research by considering the | | |
| | research design adopted | | |
| | 5. Able to explain differences in data based on further | | |
| | tests | | |
| | 6. Able to interpret the results of statistical analysis in | | |
| | scientific language | | |
| Content | 1. Data sampling | | |
| | 2. Descriptive statistics | | |
| | 3. Regression and correlation analysis | | |
| | 4. Hypothesis testing | | |

| | E Data problems |
|--------------------------|--|
| | 5. Data problems |
| | 6. Environmental design |
| | 7. Treatment design |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirement and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board |
| Reading list | 1. Efren C. Altoveros. Applied Experimental Designs for |
| | Agriculture Research (Lecture Notes) |
| | 2. Gomez, Kwanchai A and AA Gomez. 1984. Statistical |
| | procedures for agricultural research. A Wiley- |
| | Interscience publication. New York. " Previously |
| | published as: Statistical procedures for agricultural |
| | research with emphasis on rice/KA Gomez, AA Gomez. |
| | 3. Gomez Kwancahai A and Arturo Gomez, 1995. |
| | Statistical Procedures for Agricultural Research. Second |
| | edition. |
| | 4. Singarimbun, Masri and Sofian Effendi. 1989. Survey |
| | Research Methods. LP3ES. Jakarta. |
| | 5. Yitno Sumarto Suntoyo, 1993. Experiment: Analysis |
| | Design and interpretation. |
| | |
| Date of Amandement | 01 September 2022 |

Module Handbook of Landscape Analysis and Planning

| Designation module | Analysis and analysis courses Landscape Planning with CREDITS |
|-----------------------------|--|
| | 3/1, this study examines the steps landscape planning |
| | sustainably and sustainably. The competencies that will be |
| | achieved in this course are students being able to carry out |
| | analysis of sites and landscapes and their application |
| | landscape planning which is functional. To fulfill these |
| | competencies, the hard skills that students will achieve are |
| | being able to analyze the shape, character and potential of |
| | landscapes and being able to plan sustainable landscapes. |
| | Meanwhile, the soft skills that will be achieved by students are |
| | the ability to communicate to meet community needs; Ability |
| | to actualize one's potential to collaborate; and Ability to |
| | implement Islamic values in everyday life |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KP 352 |
| | |
| Semester(s) in which the | Fourth Semester |
| module is taught | |
| Person responsible for the | Dr. Ir. Bambang Heri Isnawan, MP |
| module | |
| Lecturers | Dr. Ir. Lis Noer Aini, SP, M.Si |
| (Supporting lecturer) | Dr. Ir. Bambang Heri Isnawan, MP |
| Language | Indonesian |
| Relation to curriculum | Compulsory Courses. Related to Land Use and Evaluation, |
| | Landscape Planning Analysis, Landscape Design |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Self-Directed Learning |

| | 3. Brainstorm |
|----------------------------|--|
| | 4. Contextual Learning |
| | 5. Field Study |
| | 6. Small Group Discussion |
| | 7. Written Exam |
| | 8. Description Questions |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 4 credits = 4 x 45.33 hours |
| | = 181.33 hours |
| | Workload = 181.33 hours/ 30 hours = 6.04 ECTS |
| Credit points | 4 |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended prerequisites | |
| Module objectives/intended | Learning Outcome |
| learning outcomes | Able to apply technology in agricultural systems |
| | Course Learning Outcome |
| | 1. Able to analyze the shape, character and potential of |
| | the landscape rationally |
| | 2. Able to analyze the site and landscape and apply them |
| | in functional planning in accordance with applicable |
| | regulations |
| | 3. Able to communicate the results of site analysis |
| | through work and mapping |
| | Lesson Learning Outcomes |
| | 1. Able to describe the site/landscape forming elements |
| | used as a basis for landscape planning |

| | 2. Able to carry out biophysical and social analysis of the |
|---------------------------|---|
| | site |
| | 3. Able to estimate the value of carrying capacity and land |
| | potential |
| | 4. Able to estimate the value of carrying capacity and land |
| | potential |
| Content | 1. Definition of landscape |
| | 2. Natural resources and cultural resources |
| | 3. Biophysical |
| | 4. Social footprint |
| | 5. Potential land |
| | 6. Carrying capacity |
| | 7. Crops and land |
| | 8. Climate |
| | 9. Topography |
| | 10. Geomorphology |
| | 11. Socio-cultural |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board, ArcGIS |
| Reading list | 1. Site Analysis – White |
| | 2. Site Planning – Brooks |
| | 3. Landscape Handbook for the Tropics – Hill |
| | 4. Landscape Planning– Marsh |
| | 5. Plants in the Landscape – Carpenter |
| | 6. Understanding Social Problems – Mooney, Knox & |
| | Schacht |

| | 7. Site Planning – Chiara |
|--------------------|--|
| | 8. Hydrological Aspects in Site Analysis – Nurisyah |
| | 9. Regional Planning for Preserving Landscapes and |
| | Historical Parks – Nurisyah & Qodarian |
| | 10. Carrying capacityinLandscape Planning– Nurisyah, |
| | Qodarian, Siswantinah |
| Date of Amandement | 01 September 2022 |

Module Handbook of Information and Technology in Agriculture

| Designation module | This course is designed to achieve students' basic |
|-----------------------------|---|
| | competencies in understanding precision agriculture with |
| | supporting technology such as digital maps,GPS (Global |
| | Positioning System), GIS (Geographic Information System) and |
| | VRT (Variable Rate Technology). Precision agriculture is an |
| | agricultural management concept based on observation, |
| | measurement and response to land diversity. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KL 211 (in MyKlass) - KU 553 (in Excel from Mr. Ihsan) |
| | |
| Semester(s) in which the | Fourth Semester |
| module is taught | |
| Person responsible for the | Ir. Nafi Ananda Utama, MS |
| module | |
| Lecturers | 1. Ir. Nafi Ananda Utama, MS |
| (Supporting lecturer) | 2. Dr. Lis Noer Aini, SP., MSi, |
| | 3. Taufiq Hidayat. SP, M.Sc. |
| Language | Indonesian |
| Relation to curriculum | The Agricultural Informatics in a Global Setting course is one of |
| | |
| | the mandatory courses almed at enabling students to |
| | understand and utilize the latest information technology for |
| | the mandatory courses aimed at enabling students to understand and utilize the latest information technology for the development of agricultural products and their marketing |
| | the mandatory courses aimed at enabling students to understand and utilize the latest information technology for the development of agricultural products and their marketing at the global level. This course is designed to support the |
| | the mandatory courses aimed at enabling students to understand and utilize the latest information technology for the development of agricultural products and their marketing at the global level. This course is designed to support the achievement of main competencies so that graduates are able |
| | the mandatory courses aimed at enabling students to understand and utilize the latest information technology for the development of agricultural products and their marketing at the global level. This course is designed to support the achievement of main competencies so that graduates are able to master information technology in a career, apart from that, |
| | the mandatory courses aimed at enabling students to understand and utilize the latest information technology for the development of agricultural products and their marketing at the global level. This course is designed to support the achievement of main competencies so that graduates are able to master information technology in a career, apart from that, it also serves as a basis for achieving the main competencies of |

| | and interpret data professionally. |
|----------------------------|--|
| Type of teaching, contact | 1. Self Directed Learning |
| hours | 2. Lecture |
| | 3. Brainstorming |
| | 4. Cooperative Learning |
| | 5. Simulation |
| | 6. Field |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 3 credits = 3 x 45.33 hours |
| | = 136 hours |
| | Workload = 136 hours/ 30 hours = 4.53 ECTS |
| Credit points | 3 |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended prerequisites | |
| Module objectives/intended | Learning Outcome |
| learning outcomes | Able to apply technology in agricultural systems |
| | Course Learning Outcomes |
| | 1. Ability in positioning the concept of precision |
| | agriculture in decision making in agricultural systems |
| | 2. Able to build the concept of applying variable rate |
| | technology in precision agriculture |
| | Lesson Learning Outcomes |
| | 1. Ability in positioning the concept of precision |
| | agriculture in decision making in agricultural systems |
| | 2. Able to demonstrate ability to use maps through the |
| | use of scale and coordinate points |

| | 3. Able to practice the use of the Global Positioning |
|---------------------------|---|
| | System |
| | 4. Able to combine coordinate points and land evaluation |
| | results in application maps |
| | 5. Able to pattern precision agricultural applications in the |
| | field based on application maps |
| Content | 1. Precision farming: basic objectives and concepts |
| | 2. Devices in precision agriculture (Maps, GPS, GIS, VRT) |
| | 3. IT for agricultural development |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board |
| Reading list | 1. GPS Library |
| | 2. NASA Precision Farming |
| | PrecisionAg |
| | 3. Precision Agriculture Australia |
| | 4. Top Con Precision Agriculture |
| | 5. Using GPS 1 |
| | 6. Using GPS 2 |
| | 7. Using Garmin Montana 650t GPS |
| | ArcGIS Tutorials |
| | Precision Agriculture |
| Date of Amandement | 01 September 2022 |

Module Handbook of Bioenergy & Sustainable Environment

| Designation module | The Bioenergy and Sustainable Environment course was |
|-----------------------------|---|
| | created so that students master the methods used to utilize |
| | biomass as an energy source and how it impacts the |
| | environment. The topics given in this course range from an |
| | introduction to new, renewable energy to an assessment of |
| | sustainable bioenergy projects. To be able to take the course |
| | well, students must understand biochemical processes, waste |
| | management and agroecosystems |
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 664 |
| | |
| Semester(s) in which the | Fourth Semester |
| module is taught | |
| Person responsible for the | Ir. Indira Prabasari, MP, Ph.D. |
| module | |
| Lecturers | 1. Ir. Indira Prabasari, MP, Ph.D. |
| (Supporting lecturer) | 2. Ir. Tony K. Hariadi, MT, IPM |
| | 3. Genesiska, S.Sc., M.Sc. |
| Language | Indonesian |
| Relation to curriculum | The Bioenergy and Sustainable Environment course is one of |
| | the mandatory courses aimed at supporting the achievement |
| | of key competencies so that graduates are able to understand, |
| | plan and evaluate the Bioenergy Program and its impact on the |
| | environment. |
| Type of teaching, contact | 1. Self Directed Learning: Lectures, Brainstorming |
| hours | 2. Literature review |

| | 3. Discussion |
|----------------------------|--|
| | 4. Field study Literature study |
| | 5. Practical class |
| | 6. Presentation |
| | 7. Demonstration |
| | 8. Written test |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 2 credits = 2 x 45.33 hours |
| | = 90.67 hours |
| | Workload = 90.67 hours / 30 hours = 3.02 ECTS |
| Credit points | 2 |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended prerequisites | |
| Module objectives/intended | Learning Outcome |
| learning outcomes | Able to solve agricultural problems |
| | Course Learning Outcomes |
| | 1. Able to develop sustainable bioenergy concepts |
| | 2. Able to create project designs and product processing |
| | methods that are used in a sustainable manner |
| | Lesson Learning Outcomes |
| | 1. Able to analyze the advantages and disadvantages of |
| | bioenergy compared to fossil energy |
| | 2. Able to design bioenergy projects from various |
| | commodities along with economic analysis |
| | 3. Able to compare the advantages and disadvantages of |
| | first, second, third and fourth generation biofuels |

| Content | 1. Sustainable environment |
|---------------------------|--|
| | 2. Agriculture and environment |
| | 3. Energy and environment |
| | 4. Bioenergy, agriculture and food safety |
| | 5. Bioenergy production |
| | 6. Microbial applications in solid waste |
| | 7. Environmental impacts of bioenergy production |
| | 8. Biomass assessment |
| | 9. Bioenergy creation |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board |
| Reading list | 1. Botkin, DB and Keller, EA 2000. Part I Environment as |
| | an idea. In Environmental Science, Earth as a Living |
| | Planet. John Willey and Sons, USA. pp. 1-12. |
| | 2. Kirkels, A. 2007. Course materials: Technology and |
| | Sustainability. Chapter 2. Environmental Problems. |
| | TU/e. |
| | 3. Botkin, DB and Keller, EA 2000. Part V.16. Fossil Fuels |
| | and The Environment. In Environmental Science, Earth |
| | as a Living Planet. John Willey and Sons, USA. pp. 352- |
| | 338. |
| | 4. Van der Berg, NW 1995. Beginning of LCA. |
| | 5. Ramjeawon, T. 2004. LCA of Cane-Sugar on the Island |
| | of Mauritius. Int J LCA 9 (4) 254-260 |
| | 6. Bioenergy and Agriculture: promises and Challenges. |
| | 2006. Report from IFPRI (International Food Policy |

| | Research Institute. |
|--------------------|---|
| | 7. The State of Food and Agriculture. 2008. FAO |
| | 8. Van Eijck, J. and Romijn, H. 2008. Prospects for |
| | Jatropha biofuels in Tanzania: An analysis with Strategic |
| | Niche Management. Energy Policy 36: 311-325 |
| | 9. Advancing bioenergy for sustainable development. |
| | Guidance for policy makers and investors. ESMAP. |
| | 10. The Nepal Biogas Support program: A successful model |
| | of public private partnership for rural household energy |
| | supply. RPS- UMY 5 |
| | 11. Barnett, A. 1990. The diffusion of energy technology in |
| | the rural areas of developing countries: A synthesis of |
| | recent experience. World Development 18 (4): 539- |
| | 553. |
| Date of Amandement | 01 September 2022 |

Compulsory Courses

(5th Semester)

Module Handbook of Land Use and Evaluation

| Designation module | Land is geographically defined as a specific area on the earth's |
|-----------------------------|--|
| | surface that rationally describes the biosphere system including |
| | the atmosphere above it and the geological situation beneath it |
| | including hydrological conditions, existing flora and fauna |
| | populations. In a broad sense, land is the natural landscape on |
| | the earth's surface, including the results of human creation and |
| | activity. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KP 351 |
| | |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Ir. Mulyono, MP |
| module | |
| Lecturers | 1. Ir. Mulyono, MP |
| (Supporting lecturer) | 2. Dr. Ir. Gunawan Budiyanto, MP, IPM. |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the 5th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Self Directed Learning |
| | 3. Brainstorming |
| | 4. Small group discussions |
| | 5. Discovery learning |
| | 6. Case study/presentation |
| | 7. Surveys |
| Workloads | 1 CREDITS = 170 minutes x 16 meetings |

| | = 2.720 minutes |
|---------------------|---|
| | = 45,33hours |
| | 4 CREDITS = 4 x 45,33hours |
| | = 181.33 hours |
| | Workload = 181.33 hours / 30 hours = 6,04 ECTS |
| Credit points | 4 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to evaluate the implementation of agricultural systems and |
| learning outcomes | cultivation technology |
| | Course Learning Outcomes |
| | 1. Able to understand the principles of land resources as a |
| | life asset |
| | 2. Able to evaluate land resources in accordance with the |
| | principles of natural and environmental sustainability |
| | 3. Able to evaluate land resources in accordance with the |
| | principles of natural and environmental sustainability. |
| | Lesson Learning Outcomes |
| | 1. Able to formulate the position of land resources in |
| | biosphere sustainability |
| | 2. Able to formulate land supply forms and land functions in |
| | the context of crop production |
| | 3. Able to manage land use based on evaluation results |
| | 4. Able to carry out land suitability analysis |
| Content | 1. Ecosystem and agroecosystem |
| | 2. Biosphere |

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| of dysfunction of land productivity |
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| study, assignments, quizzes |
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| , Wi-Fi, MyKlass, stationary, white board |
| ment book by Dr. Ir. Gunawan Budiyanto, |
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| d Suitability for Agricultural Development |
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| for Land Evaluation for Agricultural |
| enter for Research and Development of |
| rces |
| and resources components on Jation bach h of land use in several locations study, assignments, quizzes , Wi-Fi, MyKlass, stationary, white boar ment book by Dr. Ir. Gunawan Budiyan d Suitability for Agricultural Development ri for Land Evaluation for Agricultu enter for Research and Development irces |

| Date of amendment | 1 September 2022 |
|-------------------|------------------|

Module Handbook of Agriculture Waste Management

| Designation module | The Agricultural Waste Management course is a course designed |
|-----------------------------|---|
| | for 5th semester Agrotechnology students. This course studies |
| | the relationship between agricultural waste, the environment |
| | and humans. In this Constitutional Court, the types of waste, |
| | their origin and physical form are discussed and discussed in |
| | depth. Evaluation of the choice of waste handling method, |
| | whether converted into fertilizer or bioenergy such as briquettes |
| | and biogas, is studied in detail so that students will be able to |
| | evaluate the type of waste handling needed in an integrated |
| | agricultural system. How to manage it properly, the technical |
| | obstacles faced and not endangering the environment. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 661 |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Prof. Dr. Ir. Gunawan Budiyanto, MP IPM |
| module | |
| Lecturers | 1. Prof. Dr. Ir. Gunawan Budiyanto, MP, IPM |
| (Supporting lecturer) | 2. Ir. Indira Prabasari, MP., PhD. |
| | 3. Ir. Mulyono, MP. |
| | |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the 5th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture/Lecture |
| hours | 2. Small Group Discussion |
| | 3. Field Studies |

| | 4. Small Group Discussion |
|---------------------|--|
| | 5. Contextual Learning |
| | |
| Workloads | 1 CREDITS = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 2 CREDITS = 2 x 45,33hours |
| | = 90,67 hours |
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| Credit points | 2 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to solve agricultural problems |
| learning outcomes | Course Learning Outcomes |
| | Able to create the most appropriate waste handling method |
| | according to the characteristics of the waste |
| | Lesson Learning Outcomes |
| | Create a concept for environmentally friendly handling of |
| | agricultural waste |
| Content | 1. Characteristics of waste based on its intent and origin |
| | 2. Difference between solid and liquid waste |
| | 3. Handling food waste |
| | 4. Solid waste treatment |
| | 5. Liquid waste treatment |
| | 6. Animal manure becomes organic fertilizer |
| | 7. Conversion of agricultural waste into briquettes and |

| | biogas |
|---------------------------|--|
| | 8. Energy conversion that is environmentally friendly, |
| | affordable and efficient. |
| | 9. Upstream processes |
| | 10. Downstream processes |
| | 11. Anaerobic digestion crop |
| | 12. Handling agricultural waste |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Ghosh, Sadhan Kumar (Eds). 2019. Waste Management |
| | and Resource Efficiency. Proceedings of the 6th |
| | IConSWM 2016. Springer Publisher. |
| | 2. Bosso, Thelma (Ed). 2016. Agricultural Waste |
| | Management. Callisto Reference Publisher |
| | 3. Pal, Mahendra. 2015. Waste Treatment Technology. NIIR |
| | Project Consultancy Services Publisher |
| | |
| | |

| Designation module | Landscape Design is a Compulsory Course with 2/1 credits, |
|-----------------------------|--|
| | namely 2 lecture credits and 1 practicum credit. This course is |
| | part of the supporting competency which oversees regional |
| | planning and land evaluation. The material presented is |
| | expected to provide an understanding of the basics of design and |
| | implementation for agricultural landscapes. The material |
| | provided consists of 4 topics, namely Basic Design, Plant |
| | Construction, Human Interaction with the Landscape, and |
| | Sustainable Landscape Design. Lecture patterns are carried out |
| | either through face-to-face, online lectures, or independent |
| | assignments. At the end of the course, it is carried |
| | out <u>competence test</u> in writing and projects to create sustainable |
| | landscape designs. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KP 353 |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Dr. Lis Noer Aini, SP, M. Si. |
| module | |
| Lecturers | Dr. Lis Noer Aini, SP, M. Si. |
| (Supporting lecturer) | |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the 5th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Interactive lecture |
| hours | 2. Self Directed Learning: |
| | 3. Brainstorming |

| | 4. Tutorials |
|---------------------|---|
| | 5. Field Survey |
| | 6. Small Group Discussion |
| Workloads | 1 CREDITS = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 3 CREDITS = 3 x 45,33hours |
| | = 136 hours |
| | Workload = 136 hours/ 30 hours = 4,53 ECTS |
| Credit points | 3 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to evaluate the implementation of agricultural systems and |
| learning outcomes | cultivation technology |
| | Course Learning Outcomes |
| | 1. Ability to analyze landscape elements and their |
| | application to the character of a site |
| | 2. Ability to create functional and sustainable landscape |
| | designs |
| | Lesson Learning Outcomes |
| | 1. Able to describe basic design principles and differentiate |
| | landscape formations |
| | 2. Able to analyze forms of human interaction with the |
| | landscape |
| | 3. Able to analyze landscape formations and plants for |
| | functional landscape design |

| | 4. Able to create sustainable landscape designs by bringing |
|---------------------------|--|
| | out the beauty of the area |
| Content | 1. Design Basics: The basic elements of design and the basic |
| | principles of design |
| | 2. Classification of crops for design needs |
| | 3. Construction for cropping design |
| | 4. Human interaction with landscapes |
| | 5. Sustainable landscape design |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Plants in the Landscape – Carpenter et all, 2008- WH |
| | Freeman & Co. San Francisco |
| | 2. Landscape Handbook for the Tropics – Hill, 1995 – |
| | Garden Art Press New York |
| | 3. Landscape Architecture – Siamond, 2013 |
| Date of amendment | 1 September 2022 |

Module Handbook of Agribusiness Management of Food Crops and Horticulture

| Designation module | Agribusiness Managementis the entire agricultural business |
|-----------------------------|--|
| | activity including manufacturing, distribution of needs, |
| | production processes, storage, processing and distribution of |
| | results or commodities from farming and other types. |
| | Subjectagribusiness managementFood and Horticultural crops |
| | (2/2 CREDITS) discusses agribusiness and aspects of its |
| | development, market surveys and cultivation technology for |
| | Food and Horticultural crops, financial aspects of Food and |
| | Horticultural crops and their analysis, production management, |
| | and business planning. The role of management in agribusiness |
| | is so broad, starting from preparing (ordering) inputs before |
| | production starts, looking for workers and firing them, to |
| | marketing. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KP 454 |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Ir. Hariyono, MP |
| module | |
| Lecturers | 1. Ir. Hariyono, MP |
| (Supporting lecturer) | 2. Ir. Sukuriyati Susilo Dewi, MS |
| | 3. Ir. Lestari Rahayu, MP |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the 5th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Self Directed Learning |

| | 3. Brainstorming |
|---------------------|---|
| | 4. Contextual Instruction |
| | 5. Field Study |
| | 6. Collaborative Learning |
| Workloads | 1 CREDITS = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 4 CREDITS = 4 x 45,33hours |
| | = 181.33 hours |
| | Workload = 181.33 hours / 30 hours = 6,04 ECTS |
| Credit points | 4 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | 1. Able to develop innovative businesses in the field of |
| learning outcomes | agricultural cultivation technology |
| | 2. Able to demonstrate an attitude of working together in |
| | multidisciplines |
| | Course Learning Outcomes |
| | 1. Able to prepare market surveys and feasibility of Farming |
| | Business Analysis |
| | 2. Able to act in accordance with the tacredits given |
| | Losson Loorning Outcomos |
| | Lesson Learning Outcomes |
| | 1. Able to prepare market and farmer surveys |
| | Able to prepare market and farmer surveys Able to prepare feasibility analysis of farming business |
| | Able to prepare market and farmer surveys Able to prepare feasibility analysis of farming business Able to demonstrate the ability to work in groups in |

| Content | 1. Introduction to food crop agribusiness and horticulture |
|---------------------------|--|
| | 2. Agribusiness and its development aspects |
| | 3. Food crop and horticultural business plans |
| | 4. Survey method |
| | 5. Market survey and production technology for food crops |
| | and horticulture |
| | 6. Data analysis and preparation of survey results reports |
| | 7. Financial analysis of food crop and horticultural |
| | agribusiness management |
| | 8. Farm management and records (farm analysis) |
| | 9. Cash flow (cash flow) of horticultural farming and food |
| | crops |
| | 10. Financial analysis (continued) |
| | 11. Management of food crop production and horticulture |
| | 12. Marketing strategy and plan |
| | 13. Food crop and horticultural business planning and |
| | finance |
| | 14. Preparation of business proposals |
| | 15. Presentation and review of business proposals |
| | |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. John Willey & Sonc Inc. Gail L. & Douglas D. SCramer, |
| | Clarence W. Jensen & Douglas |
| | 2. D Southgate, Jr. Agriculture Economics and Agribusiness. |
| | John H. Davis and Ray A. Goldberg. 1957. A Concept of |

| | | Agribusiness. Boston. Mass.: Research Devision, Harvard |
|-------------------|--------|---|
| | | Business School) |
| | 3. | Ronald D. Knutson, JB Penn & Barry L. Flinchbaugh. |
| | | Agriculture and Food Policy. Prentice Hall. |
| | 4. | Ricketts Cliff, Dr & Dr. Omri Rawlins. Introduction to |
| | | Agribusiness. Thomson Learning |
| | 5. | Gatot Supangkat & Lestari Rahayu. 2007. Agribusiness |
| | | Management. Teaching materials. |
| Date of amendment | 1 Sept | ember 2022 |

Module Handbook of Plantation Plant Cultivation

| Designation module | The BTP course is a Compulsory Course with 2 credits. The aim of |
|-----------------------------|--|
| | this course is for students to be able to evaluate aspects of |
| | effective superior plantation crop cultivation practices in a |
| | sustainable agricultural system (modern and based on local |
| | wisdom), to be able to analyze and solve problems in cultivation |
| | of superior plantation crops. Learning will be carried out using |
| | cooperative learning strategies, small group discussions. The |
| | results of assignments completed by students must be uploaded |
| | to Myklass. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KL 665 |
| | |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Ir. Agus Nugroho Setiawan, MP |
| module | |
| Lecturers | 1. Ir. Agus Nugroho Setiawan, MP |
| (Supporting lecturer) | 2. Ir. Sarjiyah, MS |
| | |
| Language | Indonesian |
| Relation to curriculum | Compulsory Subjects for the 5th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Discussion |
| | 3. Collaborative Learning |
| | 4. Case Studies |
| | |

| Workloads | 1 CREDITS = 170 minutes x 16 meetings |
|---------------------|---|
| | = 2.720 minutes |
| | = 45,33hours |
| | 2 CREDITS = 2 x 45,33hours |
| | = 90,67 hours |
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| Credit points | 2 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to master the principles of agricultural cultivation |
| learning outcomes | technology in accordance with GAP |
| | Course Learning Outcomes |
| | Able to evaluate the technical cultivation of superior plantation |
| | crops |
| | Lesson Learning Outcomes |
| | 1. Able to provide arguments regarding technical problems |
| | in cultivating superior plantation crops |
| | 2. Able to evaluate cultivation practices for superior |
| | plantation crops |
| | 3. Able to evaluate issues and problems in plantations |
| Content | 1. Cultivation of tea crops |
| | 2. Rubber cultivation |
| | 3. Plantation cultivation |
| | 4. Cocoa cultivation |
| | 5. Oil palm cultivation |
| | |

| Study and examination | Lectures, projects, self-study, assignments, quizzes |
|---------------------------|--|
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | Main References: |
| | 1. Anonymous. 1993. Vademacum Rubber, Cocoa, Palm Oil, |
| | The |
| | 2. Williams. 1982. The Agronomy of The Major Tropical |
| | Crops. |
| | 3. Yayock. 1988. Crop Science and Production in Warm |
| | Climates |
| | 4. Gibbon and Pain. 1985. Crop of The Drier Regions of The |
| | Tropics. |
| | Supporting References: |
| | 1. Widyastuti, T., 2012. <u>Agricultural Cultivation in the</u> |
| | Perspective of the Qur'an. LP3M. UMY. Yogyakarta |
| | 2. Directorate General of Plantations. 2015. Indonesian |
| | Plantation Statistics 2015-2017. Cocoa |
| | 3. Supriyadi, A. and T. Widyastuti, 2014. <u>Plant Pest</u> |
| | Organisms and Their Control. LP3M UMY. Yogyakarta |
| | 4. Webster and Wilson. 1980. Agriculture in the Tropics. |
| Date of amendment | 1 September 2022 |

Module Handbook of English 5

| Designation module | |
|-----------------------------|--|
| Module level, if applicable | Undergraduate |
| Code, if applicable | |
| | |
| Semester(s) in which the | |
| module is taught | |
| Person responsible for the | |
| module | |
| Lecturers | |
| (Supporting lecturer) | |
| Language | Indonesian |
| Relation to curriculum | |
| Type of teaching, contact | See the forms/learning strategies section in RPS |
| hours | |
| Workloads | |
| Credit points | |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | CLO (COURSE LEARNING OUTCOMES) and PLO |
| objectives/intended | Lesson Learning Outcomes |
| learning outcomes | |
| Content | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |

| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
|-------------------|--|
| Reading list | |
| | |
| Date of amendment | 1 September 2022 |
Compulsory Courses

(6th Semester)

Module Handbook of Capita Selecta Agricultural Production

| Designation module | The Capita Selecta Agricultural Production course examines the |
|-----------------------------|---|
| | complexity of agricultural production, starting from legislation, |
| | government policies, to SWOT analysis of agricultural production. |
| | The potential of the concept of sustainable agriculture is also |
| | deepened in this course. The learning process is carried out |
| | through RPS-UMY 4 SWOT analysis methods in the classroom |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 561 |
| | |
| Semester(s) in which the | Sixth Semester |
| module is taught | |
| Person responsible for the | Dr. Ir. Gunawan Budiyanto, MP, IPM. |
| module | |
| Lecturers | Dr. Ir. Gunawan Budiyanto, MP, IPM. |
| | Dr. Lis Noer Aini, SP, M.Sc. |
| Language | Indonesian |
| Relation to curriculum | Compulsory Courses |
| | |
| Type of teaching, contact | 1. Self Directed Learning |
| hours | 2. Lecture |
| | 3. Brainstorming |
| | 4. Small Group Discussion |
| | 5. Case Study/Presentation |
| | 6. Presentations |
| | 7. Discovery and collaborative learning |
| | 8. Problem based learning |
| Workloads | 1 credit = 170 minutes x 16 meetings |

| | = 2,720 minutes |
|---------------------|---|
| | = 45.33 hours |
| | 4 credits = 4 x 45.33 hours |
| | = 181.33 hours |
| | Workload = 181.33 hours / 30 hours = 6.04 ECTS |
| Credit points | 4 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to evaluate the implementation of agricultural systems and |
| learning outcomes | cultivation technology |
| | Course Learning Outcomes |
| | 1. Able to analyze agricultural production processes on a |
| | regional and global scale |
| | 2. Able to analyze government policies in the field of |
| | agricultural production |
| | 3. Able to utilize global issues in planning the agricultural |
| | development process |
| | Lesson Learning Outcomes |
| | 1. Students are able to provide arguments for the position of |
| | agricultural resources in the long process of agricultural |
| | production |
| | 2. Students are able to analyze the position of agricultural |
| | products in the Indonesian economic cycle |
| | 3. Students are able to carry out a SWOT analysis of the |
| | agricultural production system in Indonesia |
| | 4. Students are able to understand and analyze government |

| | policies in the field of agricultural production |
|---------------------------|--|
| | 5. Students are able to understand and utilize global issues in |
| | planning the agricultural development process |
| Content | |
| | 1. Land, water and planting materials |
| | 2. Environment and agroecosystem |
| | 3. Human resources and technology |
| | 4. Subsistence and industrial-scale agriculture |
| | 5. Agricultural revitalization 2005 and ministry of agriculture |
| | renstra |
| | 6. Food security policies and programs |
| | 7. Pod. National / regional gross domestic product |
| | 8. The position of indonesia's main commodity production in |
| | the projected increase in state income |
| | 9. Laws and regulations in the field of agricultural production |
| | 10. Bulog authorization in handling the main food sources. |
| | 11. Egosectoral inter-ministerial policy |
| | 12. Issues of the world of agriculture (FAO) and liberalization |
| | of agricultural production (WTO, AFTA, ACFTA) |
| | 13. Capitalism and market liberalization, ecolabelling and |
| | damage to agroecosystems and climate change |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Lingkup KSPP : |
| | https://myklassagric.umy.ac.id/pluginfile.php/18536/mod |
| | <pre>_ resource/content/1/KAPITA01.pdf</pre> |
| | 2. Peraturan Perundang-undangan : |

| | https://myklassagric.umy.ac.id/mod/folder/view.php?id= |
|--------------------|--|
| | <u>5273</u> |
| | 3. Analisa SWOT : |
| | https://myklassagric.umy.ac.id/mod/resource/view.php?i |
| | d=7677 |
| Date of Amandtment | 1 September 2022 |

Module Handbook of Capita Selecta Plant Cultivation

| Designation module | Sustainable Development Goals(SDGs) mandates that all aspects |
|-----------------------------|--|
| | of development must be sustainable or sustainable so that they |
| | have a meaningful impact on human life. This mandate must also |
| | be ratified in agricultural development which must also be |
| | sustainable. There are three paradigms in sustainable |
| | development, namely economic growth, social and |
| | environmental conservation. Based on this paradigm, all aspects |
| | of development, including agriculture, must have a positive |
| | impact on economic, social growth and at the same time a |
| | sustainable environment. Agriculture is the management of |
| | environmental resources, both biological and non-biological, to |
| | meet human needs related to yield, productivity, production and |
| | in-kind (financial) profits. Environmental resources are the main |
| | component in agricultural development or development so that |
| | agricultural businesses are sustainable or sustainable, |
| | agricultural businesses must be run by considering the |
| | sustainability of environmental resources. Therefore, agricultural |
| | development in all aspects must be carried out with the concept |
| | of sustainable development. Plant cultivation technology is a |
| | main aspect in agricultural development, so any technology |
| | applied in plant cultivation activities must be based on |
| | environmental sustainability. Based on this, this course will |
| | comprehensively explain plant cultivation technology based on |
| | sustainable agricultural development. This means that input into |
| | plant cultivation activities must take into account environmental |
| | sustainability as a form of sustainable agricultural development. |
| Module level, if applicable | Undergraduate |

| Code, if applicable | KU 562 |
|----------------------------|--|
| Semester(s) in which the | Sixth Semester |
| module is taught | |
| Person responsible for the | Ir. Sarjiyah, MS |
| module | |
| Lecturers | 1. Ir. Sarjiyah, MS |
| (Supporting lecturer) | 2. Dr. Ir. Gatot Supangkat, MP, IPM. |
| | 3. Dr. Ir. Ihsan Nurkomar, SP |
| | 4. Ir. Agus Nugroho Setiawan, MP |
| Language | Indonesian |
| Relation to curriculum | Compulsory Courses. Related to Post-Harvest, Plant Cultivation |
| | Technology, Plant Physiology |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Brainstorming |
| | 3. Self Directed |
| | 4. Contextual Instruction |
| | 5. Project Based Learning |
| | 6. Cooperative Learning |
| | 7. Competence test |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 4 credits = 4 x 45.33 hours |
| | = 181.33 hours |
| | Workload = 181.33 hours / 30 hours = 6.04 ECTS |
| Credit points | 4 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |

| Recommended | |
|-----------------------|---|
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to evaluate the implementation of agricultural systems and |
| learning outcomes | cultivation technology |
| | Course Learning Outcomes |
| | 1. Able to carry out a comprehensive assessment of plant |
| | cultivation practices based on GAP |
| | 2. Able to make an assessment report on plant cultivation |
| | practices based on GAP |
| | Lesson Learning Outcomes |
| | 1. Able to assess aspects of land management in plant |
| | cultivation based on GAP |
| | 2. Able to assess aspects of preparing planting materials in |
| | plant cultivation based on GAP |
| | 3. Able to assess protection aspects in plant cultivation |
| | based on GAP |
| | 4. Able to assess post-harvest aspects in crop cultivation |
| | based on GAP |
| | 5. Able to make written and oral reports regarding the |
| | assessment of plant cultivation practices based on GAP |
| Content | 1 Diant cultivation overview |
| | 2 Lond management everyiew |
| | 2. Latiu Indiagement overview |
| | 3. Seeu preparation overview |
| | 4. Plant protection overview |
| | 5. Post-narvest overview |
| | 6. Field study |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |

| requirements and forms of | |
|---------------------------|--|
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Al Quran and Hadith |
| | 2. Agrios, G.N., (1988). Plant Pathology. San Diego: Acad. |
| | Press |
| | 3. Copeland, LO 1986. Principle of Seed Science and |
| | Technology. Burgess Publishing Company, Minneapolis, |
| | Minnesota, USA. |
| | 4. Ghazali, YA, F. Kurnianto, MKFath, and J. Ismail, 2011. |
| | Encyclopedia of the Qur'an and Hadith by Theme. Alita |
| | Aksara Media. Jakarta. |
| | 5. Goldsworthy, PR and NM Fisher, 1996. Translational |
| | Physiology of Tropical Cultivated Plants. Gadjah Mada |
| | University Press. Yogyakarta. |
| | 6. Hay, RKM and AH Fitter, 1994. Environmental Physiology |
| | of Plants. Translation. Gadjah Mada University Press. |
| | Yogyakarta. |
| | 7. Kalshoven, LGE, 1951. Pests of crops in Indonesia. |
| | 8. Kamariyani, 1986. Post-Harvest Physiology, Handling and |
| | Utilization of Tropical and Sub-Tropical Fruits and |
| | Vegetables. Translation. Gadjah Mada University Press. |
| | Yogyakarta. |
| | 9. Martin JH & WH Leonard, 1959. Principles of Field Crop |
| | Production. The Macmillan Company. New York. |
| | 10. Sánchez-Bayo, F., & Wyckhuys, K. A. (2019). Worldwide |
| | decline of the entomofauna: A review of its drivers. |
| | Biological Conservation, 232, 8-27. |
| | 11. Supriyadi, A., and T. Widyastuti, 2014. Plant Pest |

| | Organisms and Their Control. LP3M UMY. Yogyakarta. |
|--------------------|---|
| | 12. Plant Cultivation System Law. |
| | 13. Widyastuti, T., 2012. Agricultural Cultivation in the |
| | Perspective of the Koran. LP3M UMY. Yogyakarta. |
| | 14. Widyastuti, T., 2018. Ornamental Plant Cultivation |
| | Technology and Agribusiness. CV Mine. Yogyakarta |
| | |
| | |
| Date of Amandtment | 1 September 2022 |

Module Handbook of Agribusiness Management Application

| Designation module | Agribusiness Management Application is one of the |
|-----------------------------|--|
| | concentration courses which is a compilation of economics and |
| | plant cultivation. In this course, each student will apply their |
| | knowledge in a particular agricultural commodity business by |
| | making project proposals starting from obtaining funds, |
| | cultivation technology and marketing. Lectures are held face-to- |
| | face, with practice and discussion of practical results for one |
| | semester. In the face-to-face section, theory about agribusiness |
| | is given, especially for horticultural commodities, which includes |
| | production planning, financial analysis and marketing. Apart |
| | from that, guest lecturers from agribusiness and banking |
| | practitioners also held lectures. Practical activities are held in the |
| | laboratory for financial analysis and in the field for |
| | cultivationpractices. After completing the Agribusiness |
| | Management course, students can make plans, make decisions |
| | and apply business in the agribusiness field. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KP 464 |
| | |
| Semester(s) in which the | 6th Semester |
| module is taught | |
| Person responsible for the | Ir. Sukuriyati Susilo Dewi, MS |
| module | |
| Lecturers | 1. Ir. Sukuriyati Susilo Dewi, MS |
| | 2. Ir. Hariyono, MP |
| | 3. Dr. Ir. Gatot Supangkat, MP, IPM |
| Language | Indonesian |

| Relation to curriculum | Compulsory courses. Related to Agribusiness Management of |
|---------------------------|--|
| | Food Crops and Horticulture courses |
| Type of teaching, contact | 1. Self Directed Learning: Lectures, Brainstorming |
| hours | 2. Project Based Learning |
| | 3. Class discussion |
| | 4. Presentation |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 3 credits = 3 x 45.33 hours |
| | = 136 hours |
| | Workload = 136 hours / 30 hours = 4.53 ECTS |
| Credit points | 3 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | 1. Able to develop innovative businesses in the field of |
| learning outcomes | agricultural cultivation technology |
| | 2. Able to demonstrate an attitude of collaboration in |
| | multidisciplines |
| | COURSE LEARNING OUTCOMES |
| | 1. Able to carry out economic analysis and marketing of |
| | agricultural products |
| | 2. is able to carry out presentations of the results of |
| | innovative businesses in the agricultural sector |
| | 3. Able to demonstrate teamwork in plant cultivation |
| | Lesson Learning Outcomes |

| | 1. Able to carry out economic analysis as a basis for |
|---------------------------|--|
| | determining selling prices |
| | 2. able to develop marketing strategies that suit the market |
| | 3. Able to make reports and presentations on agricultural |
| | business results |
| | 4. Able to demonstrate good teamwork in cultivating plants |
| | in accordance with the business proposal |
| Content | |
| | 1. Introduction to food crop agribusiness and horticulture |
| | 2. Agribusiness and its development aspects |
| | 3. Food crop and horticultural business plans |
| | 4. Survey method |
| | 5. Market survey and production technology for food crops |
| | and horticulture |
| | 6. Data analysis and preparation of survey results reports |
| | 7. Financial analysis of food crop and horticultural |
| | agribusiness management |
| | 8. Farm management and records (farm analysis) |
| | 9. Cash flow (cash flow) of horticultural farming and food |
| | crops |
| | 10. Financial analysis (continued) |
| | 11. Management of food crop production and horticulture |
| | 12. Marketing strategy and plan |
| | 13. Food crop and horticultural business planning and |
| | finance |
| | 14. Preparation of business proposals |
| | 15. Presentation and review of business proposals |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |

| examination | |
|--------------------|--|
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Downey, WD, and SP. Erickson. 1998. Agribusiness |
| | Management. Erlangga, Jakarta |
| | 2. Kadarsan, Halimah W. 1995. Agricultural Finance and |
| | Financing of Agribusiness Companies. PT Gramedia, |
| | Jakarta |
| | 3. Krisnamurthi, Bayu and Lusi Fausia. 2002. Steps to |
| | Successfully Starting an Agribusiness. Agriwawasan |
| | Series, Penebar Swadaya, Jakarta |
| | 4. Rahardi, F; Rony Palungkun and Asiani Budiarti. 1999. |
| | Vegetable Crop Agribusiness. Self-Help Spreader, Jakarta |
| | 5. Rahardi, F; Yovita Hety Indriani and Haryono. 2000. |
| | Vegetable Crop Agribusiness. Self-Help Spreader, Jakarta |
| | 6. Supari Dh. 2001. Management of Horticultural |
| | Agribusiness Production and Operations. PT. Gramedia, |
| | Jakarta |
| | 7. Supari Dh. 2004. Building Business Challenges to Fill Your |
| | Life. |
| Date of Amandtment | 1 September 2022 |

Module Handbook of Agricultural English

| Designation module | Agricultural English is a course to prepare students to be able to |
|-----------------------------|--|
| | understand and use English according to the context of |
| | agriculture in a career. The study material in this course focuses |
| | on three main materials, namely scientific articles, abstracts and |
| | presentations of research results in English. At the end of the |
| | lesson, students are expected to be able to understand and |
| | practice how to compose scientific articles and abstracts and |
| | make presentations in English according to their scientific |
| | context. Agricultural English MK has 2 lecture credits without |
| | practicum. The MK instructors are team teaching, consisting of |
| | three lecturers from the Agrotechnology Study Program. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 167 |
| | |
| Semester(s) in which the | 6th Semester |
| module is taught | |
| Person responsible for the | Dr. Siti Nur Aisyah, SP |
| module | |
| Lecturers | 1. Innaka Ageng Rineksane, SP, MP, Ph.D. |
| (Supporting lecturer) | 2. Ir. Indira Prabasari, MP, Ph.D. |
| | 3. Dr. Siti Nur Aisyah, SP |
| Language | Indonesian |
| Relation to curriculum | Compulsory courses |
| Type of teaching, contact | Effective and efficient learning process, the Agricultural English |
| hours | MK learning process utilizes the concept of blended learning. |
| | This concept combines face-to-face and online learning |
| | processes. All material and information on learning activities can |

| | be accessed easily by students via this e-learning page. All |
|---------------------|---|
| | students are required to participate actively during the learning |
| | process, both during face-to-face meetings and through e- |
| | learning activities (in the form of assignments, forums and |
| | quizzes). |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 2 credits = 2 x 45.33 hours |
| | = 90.67 hours |
| | Workload = 90.67 hours / 30 hours = 3.02 ECTS |
| Credit points | 2 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to communicate effectively |
| learning outcomes | Course Learning Outcomes |
| | 1. Able to compose scientific articles based on research |
| | results that refer to the systematics of scientific |
| | publications in international journals |
| | 2. Able to prepare scientific presentations based on |
| | research results in English |
| | Lesson Learning Outcomes |
| | 1. Able to compose scientific articles based on research |
| | results according to international publication standards |
| | 2. Able to make scientific presentation materials based on |
| | research results in English |

| | 3. Able to make presentations in English effectively |
|---------------------------|--|
| Content | Criteria for preparation of abstract research results in english Principles of preparation and writing of scientific articles in english Presentation theory and the compilation of communicative presentation materials Designing presentation materials of research results in english |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | Alley, M. 2009. Rethinking the design of presentation slides.<u>http://web.mit.edu/me-</u> <u>ugoffice/communication/slides_talk.pdf</u> Andrade, C. (2011). How to write a good abstract for a scientific paper or conference presentation. Indian journal of psychiatry, 53(2), 172. |
| | 3. Anonymous. 2014. Scientific Papers.<u>https://www.nature.com/scitable/topicpage/scientific-papers-13815490/</u> 4. Borja, A. 2014. 11 Steps to structuring a science paper editors will take it seriously.<u>https://www.elsevier.com/connect/11-steps-to-structuring-a-science-paper-editors-will-take-seriously</u>. |

| | 5. | Larkin, | М. | 2015. | How | to | give | a dy | namic | scientific |
|--------------------|-----|-----------------|----------------|-----------------|----------|--------|--------|---------|---------|-------------------|
| | | present | ation | . <u>https:</u> | //ww | w.els | sevier | .com/ | connec | <u>ct/how-to-</u> |
| | | <u>give-a-c</u> | dynam | <u>nic-scie</u> | entific- | -pres | sentat | tion. | | |
| | 6. | McKee, | К. | 2018 | 3. Н | low | to | Writ | e a | Scientific |
| | | Abstrac | t. <u>http</u> | s://wv | vw.wi | ley.c | :om/n | etwor | k/rese | archers/p |
| | | <u>reparin</u> | g-you | <u>r-articl</u> | e/hov | w-to- | -write | -a-scie | ntific- | <u>abstract</u> |
| | 7. | Paiva, I | RP 20 | 13. Ho | w to | Writ | te Go | od Sci | entific | Papers: A |
| | | Compre | ehensi | ive | Guide | э. | Tuto | orial: | http | ://rppaiva. |
| | | dei.uc.p | ot/puł | olicatio | ns/Tu | itoria | als/go | odPap | ers. po | df. |
| | | | | | | | | | | |
| Date of Amandtment | 1 5 | eptemb | er 202 | 22 | | | | | | |

Compulsory Courses

(7th Semester)

| Designation module | A thesis is a scientific written work in the form of a written |
|-----------------------------|--|
| | presentation of research results that discusses a problem in a |
| | particular field of science using the rules that apply in a field of |
| | science. A thesis is a scientific paper that must be done by |
| | every student taking the undergraduate study program (S-1) at |
| | the Faculty of Agriculture, Agrotechnology Study Program as |
| | the final assignment in the student's studies. The thesis is also |
| | evidence that shows the academic abilities of the student |
| | concerned in research related to educational problems |
| | according to their field of study. The weight of credits for a |
| | thesis varies between 4-6 credits depending on the level of |
| | work carried out by the student. Preparing a thesis starts from |
| | preparing a proposal, seminar proposal, research |
| | (observation/experimental), |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KU 474 |
| | |
| Semester(s) in which the | |
| module is taught | |
| Person responsible for the | |
| module | |
| Lecturers | |
| (Supporting lecturer) | |
| Language | Indonesian |
| Relation to curriculum | |
| | |
| Type of teaching, contact | Self Directed Learning |

| hours | Discovery Learning | | | | | |
|----------------------------|---|--|--|--|--|--|
| | Experimental Learning | | | | | |
| | Contextual Learning | | | | | |
| | Presentations | | | | | |
| Workloads | 1 credit = 170 minutes x 16 meetings | | | | | |
| | = 2,720 minutes | | | | | |
| | = 45.33 hours | | | | | |
| | 5 credits = 5 x 45.33 hours | | | | | |
| | = 226.666667 hours | | | | | |
| | Workload = 226.666667 hours/ 30 hours = 7.56 ECTS | | | | | |
| Credit points | 5 | | | | | |
| Requirements | To pass the subject, the minimum attendance is 80% and | | | | | |
| | collect all the assignments given | | | | | |
| Recommended prerequisites | | | | | | |
| Module objectives/intended | CLO (COURSE LEARNING OUTCOMES) and PLO | | | | | |
| learning outcomes | Lesson Learning Outcomes | | | | | |
| Content | 1 Prenaration of Pronosals | | | | | |
| | 2 Application of research designs in the field | | | | | |
| | 2. Writing scientific papers | | | | | |
| | 4 Procentation of scientific papers | | | | | |
| | 4. Presentation of scientific papers | | | | | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes | | | | | |
| requirements and forms of | | | | | | |
| examination | | | | | | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white | | | | | |
| | board | | | | | |
| Reading list | Buku Panduan Penyusunan Skripsi Program Studi Agroteknologi, Fakultas Pertanian UMY. | | | | | |

| Date of Amandtment | 1 September 2022 |
|--------------------|------------------|
| | |

Module Handbook of Professional Internships

| Designation module | Professional internships are activities carried out in the field, |
|-----------------------------|---|
| | namely in a company or agency in order to improve knowledge |
| | and skills. The aim of professional internships is to provide |
| | additional insight into actual agricultural activities in the field |
| | and improve the quality of graduates in terms of work |
| | experience/skills and develop community commitment |
| | through the Learning by Doing process. |
| | There are two professional apprenticeship models, namely the |
| | collective model and the independent model. The collective |
| | model is where participants are in groups (based on location), |
| | placed in the same location (can be specific to one department |
| | or mixed), the place, time and number of participants are |
| | determined by the faculty. The faculty provides complete |
| | information about location conditions, accommodation and |
| | living costs as well as permits. The independent professional |
| | internship model means that participants are individuals (can |
| | be in groups), participants have the right to determine their |
| | own location, provided that they are not in a collective model |
| | professional internship location. The time and number of |
| | independent model professional apprentices is determined by |
| | yourself. The faculty helps with administration and licensing. |
| | Participants first carry out a location survey, to determine the |
| | feasibility of a professional internship location. |
| | |
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 471 |
| Semester(s) in which the | |

| module is taught | |
|----------------------------|--|
| Person responsible for the | Taufiq Hidayat, SP, M.Sc. |
| module | |
| Lecturers | |
| (Supporting lecturer) | |
| Language | Indonesian |
| Relation to curriculum | |
| Type of teaching, contact | Self Directed Learning |
| hours | Discovery Learning |
| | Contextual Learning |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 3 credits = 3 x 45.33 hours |
| | = 136 hours |
| | Workload = 136 hours/ 30 hours = 4.53 ECTS |
| Credit points | 3 |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended prerequisites | |
| Module objectives/intended | CLO (COURSE LEARNING OUTCOMES) and PLO |
| learning outcomes | Lesson Learning Outcomes |
| Content | Soft skills (attitude, socialization, sincerity, leadership, innovation, creativity, communication, cooperation, entrepreneurship, English, IT) Mastery of competence |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |

| examination | |
|--------------------|--|
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board |
| Reading list | https://lppmp.uns.ac.id/wp- |
| | content/uploads/2020/03/Kampus-Merdeka-ver17-FEBpdf |
| | https://agrotechnology.umy.ac.id/wp-content/uploads/ |
| | 2016/07/PANDUANMAGANG-PROFESI-FAKULTAS-PERTANIAN- |
| | UMY.pdf |
| Date of Amandtment | 1 September 2022 |

Elective Courses

Module Handbook of Marginal Land Management

| Designation module | |
|-----------------------------|---|
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 672 |
| | |
| Semester(s) in which the | |
| module is taught | |
| Person responsible for the | Dr. Ir. Gunawan Budiyanto, MP, IPM., ASEAN.Eng. |
| module | |
| Lecturers | Dr. Ir. Gunawan Budiyanto, MP, IPM., ASEAN.Eng. |
| (Supporting lecturer) | Ir. Mulyono, MP |
| Language | Indonesian |
| Relation to curriculum | Elective courses. Related to Soil Science Courses, Soil and Plant |
| | Analysis. |
| Type of teaching, contact | 1. Self Directed Learning |
| hours | 2. Presentation |
| | 3. Problem Based Learning4. Small Group Discussion |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 2 credits = 2 x 45.33 hours |
| | = 90.67 hours |
| | Workload = 90.67 hours / 30 hours = 3.02 ECTS |
| Credit points | 2 |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended prerequisites | |
| Module objectives/intended | Learning Outcomes |

| learning outcomes | Able to evaluate the implementation of agricultural systems |
|---------------------------|---|
| | and cultivation technology |
| | Course Learning Outcomes |
| | 1. Able to analyze the causes of marginal land |
| | 2. Able to manage marginal land use according to |
| | environmental sustainability principles |
| | 3. Able to implement appropriate regional planning |
| | technology in the use of various types of marginal land |
| | Lesson Learning Outcomes |
| | 1. Able to identify and analyze the causes of marginal land |
| | 2. Able to manage the use of various types of marginal |
| | land in accordance with local wisdom |
| | 3. Able to implement regional planning technology in |
| | various types of management |
| Content | 1 Sand land management |
| | Swampland management |
| | 3 Peatland management |
| | 4 Management of ex-mining land |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board, ArcGIS |
| Reading list | 1. Agus, F., Hairiah, K., & Mulyani, A. (2010). Measuring |
| | carbon stock in peat soils: practical guidelines. World |
| | Agroforestry Centre. |
| | 2. Osaki, M., Nursyamsi, D., Noor, M., & Segah, H. (2016). |
| | Peatland in Indonesia. In Tropical peatland ecosystems |

| | (pp. 49-58). Springer, Tokyo. |
|----|---|
| 3. | Segah, H. (2015). Peatland in Indonesia. Tropical |
| | Peatland Ecosystems, 49. |
| 4. | Yuwono, NW (2009). Building soil fertility on marginal |
| | land. Journal of Soil and Environmental Sciences, 9(2), |
| | 137- 141. |
| 5. | Ekowati, D., & Nasir, M. (2011). The Growth of Maize |
| | Crop (Zea Mays, L.) Bisi-2 Variety on Rejected and Non |
| | Rejected Sand at Trisik Kulon Progo Beach (the Growth |
| | of Maize Crop (Zea Mays L.) Bisi-2 Variety on Rejected |
| | and Non Rejected Sand at Trisik Kulon Beach Progo). |
| | Journal of Man and the Environment, 18(3), 220-231. |
| 6. | Yudono, P., Sulistyaningsih, E., & Hanudin, E. (2008). |
| | The Effect of Soil Improvement on Soil Physical |
| | Properties and Shallot Yield on the Sand Land of Bugel |
| | Beach, Kulon Progo Regency. Agrin, 12(1), 67-77. |
| 7. | Alihamsyah, T. (2005). Development of Lebak Swamp |
| | Land for Agricultural Businesses. Balittra. |
| 8. | Utama, MZH, Haryoko, W., & Munir, R. (2009). |
| | Screening of salinity tolerant rice varieties on swamp |
| | land in Pesisir Selatan district. Indonesian Journal of |
| | Agronomy, 37(2). |
| 9. | Suharno, S., Sancayaningsih, RP, Soetarto, ES, & |
| | Kasiamdari, RS (2014). The Presence of Arbuscular |
| | Mycorrhizal Fungi in the Tailings of Timika Gold Mining |
| | as an Environmentally Friendly Attempt. Journal of Man |
| | and Environment, 21(3), 295- 303. (2008). The Effect of |
| | Soil Improvement on Soil Physical Properties and |
| | Shallot Yield on the Sand Land of Bugel Beach, Kulon |

| | Progo Regency. Agrin, 12(1), 67-77. |
|-------------------|-------------------------------------|
| Date of amendment | 1 September 2022 |

Module Handbook of In Vitro Culture

| Designation module | The in vitro culture course discusses factors that influence the |
|-----------------------------|--|
| | success of in vitro culture, plant morphogenesis in in vitro |
| | culture, in vitro propagation, organogenesis, embryogenesis, |
| | embryo culture, organ culture, haploid culture, protoplast |
| | culture, cryopreservation, culture for metabolite production |
| | secondary. techniques for improving plant quality, making |
| | plants disease free. the role of in vitro culture in plant |
| | engineering, acclimatization of cultured plants. The final part |
| | of this course studies the application of in vitro culture |
| | techniques for plant propagation and its problems. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KL 666 |
| | |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Innaka Ageng Rineksane, SP, MP, Ph.D. |
| module | |
| Lecturers | 1. Etty Handayani, SP, M.Sc. |
| (Supporting lecturer) | 2. Innaka Ageng Rinesane, SPMP, Ph.D. |
| | |
| Language | Indonesian |
| Relation to curriculum | Elective Subjects for the 5th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Self Directed Learning |
| hours | 2. Brainstorming |
| | 3. Small group discussions |
| | 4. Discovery learning |
| | |

| | 5. Interactive Lectures |
|----------------------------|--|
| | 6. Laboratory experiments |
| | 7. Project-based learning |
| | 8. Learning by doing |
| Workloads | 1 CREDITS = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 3 CREDITS = 3 x 45,33hours |
| | = 136 hours |
| | Workload = 136 hours/ 30 hours = 4,53 ECTS |
| Credit points | 3 |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended prerequisites | |
| Module objectives/intended | Learning Outcomes |
| learning outcomes | Able to apply technology in agricultural systems |
| | Course Learning Outcomes |
| | 1. Able to integrate the role of in vitro culture in plant |
| | |
| | propagation |
| | propagation 2. Able to carry out plant micropropagation using in vitro |
| | propagation2. Able to carry out plant micropropagation using in vitro culture techniques |
| | propagation 2. Able to carry out plant micropropagation using in vitro culture techniques 3. Able to design in vitro culture applications in the fields |
| | propagation 2. Able to carry out plant micropropagation using in vitro culture techniques 3. Able to design in vitro culture applications in the fields of agriculture and conservation |
| | propagation 2. Able to carry out plant micropropagation using in vitro culture techniques 3. Able to design in vitro culture applications in the fields of agriculture and conservation Lesson Learning Outcomes |
| | propagation 2. Able to carry out plant micropropagation using in vitro culture techniques 3. Able to design in vitro culture applications in the fields of agriculture and conservation Lesson Learning Outcomes Able to integrate the principles and methods of both |
| | propagation 2. Able to carry out plant micropropagation using in vitro culture techniques 3. Able to design in vitro culture applications in the fields of agriculture and conservation Lesson Learning Outcomes 1. Able to integrate the principles and methods of both vegetative and generative propagation in plant |
| | propagation 2. Able to carry out plant micropropagation using in vitro culture techniques 3. Able to design in vitro culture applications in the fields of agriculture and conservation Lesson Learning Outcomes 1. Able to integrate the principles and methods of both vegetative and generative propagation in plant micropropagation |

| | generative in vitro culture |
|---------------------------|--|
| | 3. Able to design in vitro culture applications, both |
| | vegetative and generative cultures, to improve plant |
| | quality and conservation efforts |
| Content | 1. Preparation of tools, materials and sterilization |
| | 2. Inoculation and incubation |
| | 3. Sub-culture |
| | 4. Multiplication |
| | 5. Acclimatization |
| | 6. Organogenesis |
| | 7. Embryogenesis |
| | 8. Application of in vitro culture technology |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board |
| Reading list | Main References: |
| | 1. George, EF and Sherrington, PD (1984) Plant Propagation |
| | by Tissue Culture: A Hand Book and Dictionary of |
| | Commercial Laboratories. Exgetics Ltd., England. |
| | 2. Anis, M., A. Naseem. (2016). Plant tissue culture: |
| | propagation, conservation and crop improvement. |
| | Springer., Singapore. 616p |
| | |
| | Supporting References: |
| | 1. George, E.F., MA Hall, Klerk, GJ.D. (2008). Plant |
| | Propagation by Tissue Culture 3rd Edition. Springer. |

| | Netherlands.504p. | |
|-------------------|---|--|
| | 2. Bhojwani, SS and PK Dantu. (2012). Plant Tissue Culture: | |
| | An Introductory Text. Springer. India. 309p | |
| Date of amendment | 1 September 2022 | |

Module Handbook of Plant Growth Regulator

| Designation module | Subject Plant Growth Regulator study the types and |
|-----------------------------|--|
| | characteristics of natural and synthetic growth regulators. This |
| | course also studies active ingredients and mechanisms of |
| | action growth regulator in plants. Apart from that, there are |
| | benefits growth regulator in increasing plant growth is also |
| | discussed in this lecture. The final part of this course studies |
| | applications growth regulator natural and synthetic in plant |
| | cultivation. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KL 670 |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Innaka Ageng Rineksane, SP, M.Sc., Ph.D. |
| module | |
| Lecturers | 1. Innaka Ageng Rineksane, SP, M.Sc., Ph.D. |
| (Supporting lecturer) | 2. Dr. Ir. Gatot Supangkat, MP, IPM |
| Language | Indonesian |
| Relation to curriculum | Elective Subjects for the 5th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Brainstorming |
| Workloads | 1 CREDITS = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 2 CREDITS = 2 x 45,33hours |
| | = 90,67 hours |
| | |

| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
|----------------------------|--|
| Credit points | 2 |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |
| Recommended prerequisites | |
| Module objectives/intended | Learning Outcomes |
| learning outcomes | Able to apply technology in agricultural systems |
| | Course Learning Outcomes |
| | 1. Able to determine the type, biosynthesis, and |
| | mechanism of use of growth regulators in cultivated |
| | plants |
| | 2. Able to design the use of growth regulators in |
| | agricultural cultivation |
| | Lesson Learning Outcomes |
| | 1. Able to determine the type, biosynthesis and |
| | mechanism of use of growth regulators in cultivated |
| | plants |
| | 2. Able to use growth regulators in plant cultivation |
| Content | 1. Biosynthesis and hormone metabolism |
| | 2. Potential utilization of growth hormones |
| | 3. Hormone analysis |
| Study and examination | Locturos projects self study accignments quizzes |
| requirements and forms of | Lectures, projects, sen-study, assignments, quizzes |
| evention and forms of | |
| | |
| Media employed | Laptop, LCD, Ms. Office, WI-FI, MyKlass, stationary, white |
| | board |
| Reading list | 1. <u>http://ncert.nic.in/NCERTS/I/kebo115.pdf</u> |
| | 2. <u>https://www.cdpr.ca.gov/docs/license/grthreg.pdf</u> |
| | 3. Bhatla, SC and MA Lal. 2018. Plant Physiology, |
|-------------------|---|
| | Development and Metabolism. Springer Nature |
| | Singapore Pte Ltd. |
| | 4. Srivastava, LM 2002. Plant Growth and Development: |
| | Hormones and Environment. Academic Press. San |
| | Diego, California, USA |
| | |
| Date of amendment | 1 September 2022 |

Module Handbook of Agricultural Pest

| Designation module | This course studies the taxonomy and bioecology of pests/natural |
|---|---|
| | enemies in relation to integrated pest management to support |
| | sustainable agricultural systems. |
| Module level, if | Undergraduate |
| applicable | |
| Code, if applicable | CL 671 |
| | |
| Semester(s) in which | 5 |
| the module is taught | |
| Person responsible for | Dina Wahyu Trisnawati, SP, M.Agr., Ph.D. |
| the module | |
| Lecturers | 1. Dr. Ihsan Nurkomar, SP |
| (Supporting lecturer) | 2. Dina Wahyu Trisnawati, SP, M.Agr., Ph.D. |
| | |
| | |
| Language | Indonesian |
| Language Relation to curriculum | Indonesian Elective Subjects for the 5th Semester Agrotechnology Study Program |
| Language Relation to curriculum | Indonesian Elective Subjects for the 5th Semester Agrotechnology Study Program |
| Language Relation to curriculum Type of teaching, | Indonesian Elective Subjects for the 5th Semester Agrotechnology Study Program 1. Lecture |
| Language Relation to curriculum Type of teaching, contact hours | Indonesian Elective Subjects for the 5th Semester Agrotechnology Study Program 1. Lecture 2. Self Directed Learning |
| Language Relation to curriculum Type of teaching, contact hours | Indonesian Elective Subjects for the 5th Semester Agrotechnology Study Program 1. Lecture 2. Self Directed Learning 3. Brainstorming |
| Language Relation to curriculum Type of teaching, contact hours | Indonesian Elective Subjects for the 5th Semester Agrotechnology Study Program 1. Lecture 2. Self Directed Learning 3. Brainstorming 4. Small group discussions |
| Language Relation to curriculum Type of teaching, contact hours | Indonesian Elective Subjects for the 5th Semester Agrotechnology Study Program 1. Lecture 2. Self Directed Learning 3. Brainstorming 4. Small group discussions 5. Discovery learning |
| Language Relation to curriculum Type of teaching, contact hours | Indonesian Elective Subjects for the 5th Semester Agrotechnology Study Program 1. Lecture 2. Self Directed Learning 3. Brainstorming 4. Small group discussions 5. Discovery learning 6. Field study |
| Language Relation to curriculum Type of teaching, contact hours Workloads | IndonesianElective Subjects for the 5th Semester Agrotechnology Study Program1. Lecture2. Self Directed Learning3. Brainstorming4. Small group discussions5. Discovery learning6. Field study1 CREDITS = 170 minutes x 16 meetings |
| Language Relation to curriculum Type of teaching, contact hours Workloads | IndonesianElective Subjects for the 5th Semester Agrotechnology Study Program1. Lecture2. Self Directed Learning3. Brainstorming4. Small group discussions5. Discovery learning6. Field study1 CREDITS = 170 minutes x 16 meetings= 2.720 minutes |
| Language Relation to curriculum Type of teaching, contact hours Workloads | IndonesianElective Subjects for the 5th Semester Agrotechnology Study Program1. Lecture2. Self Directed Learning3. Brainstorming4. Small group discussions5. Discovery learning6. Field study1 CREDITS = 170 minutes x 16 meetings= 2.720 minutes= 45,33hours |

| | = 90,67 hours |
|---------------------|--|
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| Credit points | 2 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect all |
| | the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to apply technology in agricultural systems |
| learning outcomes | Course Learning Outcomes |
| | 1. Able to determine the character and morphology of insect |
| | pests and natural enemies |
| | 2. Able to design pest management methods based on the |
| | bioecology of natural enemies |
| | Lesson Learning Outcomes |
| | 1. Able to determine the character and morphology of insect |
| | pests |
| | 2. Able to determine the character and morphology of insects. |
| | Natural enemies |
| | 3. Able to design pest control methods using parasitoids |
| | 4. Able to design pest control methods using predators |
| Content | 1. Identification of natural pests/enemies |
| | 2. The role and function of natural pests/enemies in the |
| | agroecosystem |
| | 3. Biology of pests / natural enemies and their natural enemies |
| | 4. Biology of pests / natural enemies and their natural enemies |
| Study and | Lectures, projects, self-study, assignments, quizzes |
| examination | |

| requirements and | |
|----------------------|--|
| forms of examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Borror, D. J., & DeLong, D. M. (1964). An introduction to the |
| | study of insects.Rev. ed. Holt, Rinehart and Winston, New |
| | York. |
| | 2. Chapman, R.F., & Chapman, R.F. (1998). The insects: |
| | structure and function. Cambridge university press. |
| | 3. Godfray, H. C. J., & Godfray, H. C. J. (1994). Parasitoids: |
| | behavioral and evolutionary ecology. Princeton University |
| | Press. |
| Date of amendment | 1 September 2022 |

Module Handbook of Medicinal Plant Cultivation

| Designation module | Medicinal Plant Cultivation is a course that provides students |
|-----------------------------|--|
| | with an overview, insight and knowledge about medicinal |
| | plants that have not been optimally explored. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KL 662 |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Ir. Sarjiyah, MS |
| module | |
| Lecturers | 1. Ir. Sarjiyah, MS |
| (Supporting lecturer) | 2. Etty Handayani, SP, M.Sc. |
| Language | Indonesian |
| Relation to curriculum | Elective courses |
| Type of teaching, contact | 1. Tutorials |
| hours | 2. Discovery Learning |
| | 3. Small Group Discussion |
| | 4. Self-Directed Learning |
| | 5. Quiz |
| Workloads | 2 |
| Credit points | 1 CREDITS = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 2 CREDITS = 2 x 45,33hours |
| | = 90,67 hours |
| | Workload = 90,67 hours / 30 hours = 3,02 ECTS |
| Requirements | To pass the subject, the minimum attendance is 80% and |
| | collect all the assignments given |

| Recommended prerequisites | |
|----------------------------|--|
| Module objectives/intended | Learning Outcomes |
| learning outcomes | Able to master the principles of agricultural cultivation |
| | technology in accordance with GAP |
| | Course Learning Outcomes |
| | 1. Able to analyze the potential, prospects and |
| | development of medicinal plants in Indonesia |
| | 2. Able to design medicinal plant cultivation in a |
| | sustainable agricultural system |
| | Lesson Learning Outcomes |
| | 1. Able to explain the meaning of medicinal plants and the |
| | history of the use of medicinal plants in Indonesia. |
| | 2. Able to explain the meaning of medicinal plants and the |
| | history of the use of medicinal plants in Indonesia. |
| | 3. Able to explain the meaning of medicinal plants and the |
| | history of the use of medicinal plants in Indonesia. |
| | 4. Able to explain the meaning of medicinal plants and the |
| | history of the use of medicinal plants in Indonesia. |
| Content | 1. Definition of medicinal plants |
| | 2. Classification of medicinal plants |
| | 3. History of medicinal plants in indonesia |
| | 4. Human resource potential |
| | 5. Natural resource potential |
| | 6. Market opportunity |
| | 7. Land preparation techniques |
| | 8. Seed preparation technique |
| | 9. Planting technique |
| | 10. Plant maintenance techniques |

| | 11. Harvesting technique |
|---------------------------|--|
| | 12. Post harvest handling |
| | 13. The part that is utilized |
| | 14. Active ingredients |
| | 15. Efficacy |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| avamination | |
| | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white |
| | board |
| Reading list | 1. Dalimartha, S. 2006. Atlas of Indonesian Medicinal |
| | Plants. Trubus Agriwidya |
| | 2. Agromedia Editorial. 2006. Traditional Herbal Medicine |
| | for Treating Disease. Agromedia Library. |
| | 3. Syamsuhidayat, SS, JR Hutapea. 1999. Inventory of |
| | Indonesian Medicinal Plants. Farmer's Son |
| | |

Module Handbook of Agricultural Mechanization

| Designation module | The Agricultural Mechanization course is an advanced elective |
|-----------------------------|---|
| | course. This course is designed to achieve basic competency in |
| | courses based on the application of mechanization technology |
| | in the agricultural sector. The final achievement of this course is |
| | that each student is expected to be able to plan, design, |
| | implement and evaluate agricultural mechanization in |
| | supporting conventional and modern agricultural cultivation |
| | activities in accordance with GAP |
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 674 |
| | |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Ir. Sukuriyati Susilo Dewi, MS |
| module | |
| Lecturers | 1. Ir. Sukuriyati Susilo Dewi, MS |
| (Supporting lecturer) | 2. Ir. Mulyono, MP |
| | 3. Taufiq Hidayat, SP, M.Sc. |
| | |
| Language | Indonesian |
| Relation to curriculum | Elective Subjects for the 5th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Collaborative Learning |
| | 3. Visual Learning |
| | 4. Experiential Learning |
| | |

| Workloads | 1.51 ECTS |
|---------------------|--|
| | 1 credit = 170 minutes X 16 meetings |
| | Workload = 45.33333 hours / 30 hours |
| | = 1.51 ECTS |
| Credit points | 1 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to apply technology in agricultural systems |
| learning outcomes | Course Learning Outcomes |
| | 1. Able to determine the differences between various types |
| | of combustion engines and their application in |
| | agricultural mechanization |
| | 2. Able to operate various agricultural mechanization |
| | machines |
| | Lesson Learning Outcomes |
| | 1. Able to determine the important role of mechanization |
| | in the agricultural sector |
| | 2. Able to determine the differences between various types |
| | of combustion engines |
| | 3. Capable to operate agricultural land processing |
| | machines |
| | 4. Capable designing irrigation systems |
| | 5. Capable developing the concept of agricultural |
| | mechanization at the plant maintenance stage |
| | 6. Capable to operate various harvesting and post-harvest |
| | machines |

| Content | 1. Engine burn |
|---------------------------|--|
| | 2. Pumps and irrigation |
| | 3. Land processing |
| | 4. Care |
| | 5. Harvest and postharvest |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | Introduction to gasoline engines: https://myklass- agric.umy.ac.id/pluginfile.php/19889/mod_resource/con tent/1/power-point-motor-bensin_compressed.pdf Combustion motorbike: https://drive.google.com/file/d/1ICGREZ9R1BOVqMwAl P0zTrhB5h8ofBcH/view |
| Date of amendment | 1 September 2022 |

Module Handbook of Agricultural Biotechnology

| Designation module | Agricultural Biotechnology (KL-675) is a science that studies the |
|-----------------------------|--|
| | use of living creatures in part or in full to produce goods/services |
| | for the benefit of increasing agricultural products. This course is |
| | one of the elective courses aimed at supporting the achievement |
| | of graduates' main competencies in terms of technology |
| | applications in agricultural systems (LEARNING OUTCOMES 5). |
| | The study material in this course is focused on two main topics, |
| | namely the basic concepts of biotechnology and the application |
| | of biotechnology in the agricultural sector (especially for the |
| | purpose of improving the quality of plant cultivation and |
| | agroecosystem management). The course has a weight of 3 |
| | credits consisting of 2 lecture credits and 1 practicum credit. The |
| | implementation of this MK was carried out in 16 meetings, both |
| | face-to-face and online. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KL 675 |
| | |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Innaka Ageng Rineksane, Ph.D. |
| module | |
| Lecturers | 1. Ir. Agung Astuti, M.Sc. |
| (Supporting lecturer) | 2. Dr. Siti Nur Aisyah, SP |
| | 3. Innaka Ageng Rineksane, SP, MP, Ph.D. |
| | 4. Etty Handayani, SP, M.Sc. |
| | 5. Prof. Dr. Ir. Rina Laksmi Hendrati |
| Language | Indonesian |

| Relation to curriculum | Elective Subjects for the 5th Semester Agrotechnology Study |
|---------------------------|--|
| | Program |
| Type of teaching, contact | 1. Interactive lecture |
| hours | 2. Case study |
| | 3. Small group discussions |
| | 4. Discovery learning |
| | 5. Laboratory experiments |
| | 6. Interactive lecture |
| Workloads | 1.51 ECTS |
| | 1 credit = 170 minutes X 16 meetings |
| | Workload = 45.33333 hours / 30 hours |
| | = 1.51 ECTS |
| Credit points | 1 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to apply technology in agricultural systems |
| learning outcomes | Course Learning Outcomes |
| | 1. Able to determine the application of biotechnology in the |
| | production of biological fertilizer |
| | 2. Able to determine the application of biotechnology in |
| | agroecosystem management |
| | 3. Able to determine the application of biotechnology in |
| | plant breeding |
| | Lesson Learning Outcomes |
| | 1. Able to determine the application of modern and |
| | conventional biotechnology in the production of |

| | biological fertilizer |
|---------------------------|--|
| | 2. Able to determine the application of modern and |
| | conventional biotechnology in increasing plant resistance |
| | to stress |
| | 3. Able to determine the application of biotechnology for |
| | handling contaminated environments |
| | 4. Able to determine the application of modern and |
| | conventional biotechnology in improving plant quality |
| Content | 1. Conventional and modern agricultural biotechnology |
| | 2. Biotechnology for biofertilizer development |
| | 3. Biotechnology for land remediation |
| | 4. Biotechnology for plant breeding |
| | 5. Biotechnology for increasing plant resistance to biotic |
| | environmental stresses |
| | 6. Biotechnology for increasing plant resistance to abiotic |
| | environmental stresses |
| | 7. Introduction to the concept of bioinformatics, biosafety |
| | and bioethics |
| | 8. Problematic use of biotechnology products in the field |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | Main References: |
| | 1. Mahanty, T., Bhattacharjee, S., Goswami, M., |
| | Bhattacharyya, P., Das, B., Ghosh, A., & Tribedi, P. (2017). |
| | Biofertilizers: a potential approach for sustainable |
| | agricultural development. Environmental Science and |

| | Pollution Research, 24(4), 3315-3335. |
|----|--|
| 2. | Reddy, G.C., Goyal, R.K., Puranik, S., Waghmar, V., |
| | Vikram, K.V., & Sruthy, K.S. (2020). Biofertilizers toward |
| | sustainable agricultural development. In Plant microbe |
| | symbiosis (pp. 115-128). Springer, Cham. |
| 3. | Herdt, R. W. (2006). Biotechnology in agriculture. Annual |
| | Review of Environment and Resources, 31(1), 265-295. |
| 4. | Zhu, H., Li, C., & Gao, C. (2020). Applications of CRISPR- |
| | Cas in agriculture and plant biotechnology. Nature |
| | Reviews Molecular Cell Biology, 21(11), 661-677. |
| 5. | Munawar, S., Mustafa, G., Khan, M.S., & Joyia, F.A. |
| | (2020). Role of biotechnology in climate resilient |
| | agriculture. In Environment, climate, plant and vegetation |
| | growth (pp. 339-365). Springer, Cham. |
| | |
| 6. | Yadav, A.N., Singh, J., Singh, C., & Yadav, N. (2021). |
| | Current trends in microbial biotechnology for sustainable |
| | agriculture. Springer Singapore. |
| 7. | Nayak, S. K., Dash, B., & Baliyarsingh, B. (2018). Microbial |
| | remediation of persistent agro-chemicals by soil bacteria: |
| | an overview. Microbial biotechnology, 275-301. |
| 8. | Agathos, S., & Reineke, W. (Eds.). (2002). Biotechnology |
| | for the environment: Soil remediation (Vol. 3). Springer |
| | Science & Business Media. |
| 9. | Kaushal, M., & Prasad, R. (2021). Microbial Biotechnology |
| | in Crop Protection. Springer. |
| 10 | . Collinge, D. B. (Ed.). (2016). Plant pathogen resistance |
| | biotechnology. John Wiley & Sons. |
| | |
| | |

| | Suppo | rting References: |
|-------------------|--------|---|
| | 1 | Zhao I Lu I Wang A Zhang H Huang M Wu H |
| | 1. | |
| | | & JI, R. (2020). Nano-biotechnology in agriculture: use of |
| | | nanomaterials to promote plant growth and stress |
| | | tolerance. Journal of agricultural and food chemistry, |
| | | 68(7), 1935-1947. |
| | 2. | Aggani, S.L. (2013). Development of bio-fertilizers and its |
| | | future perspective. Scholars Academic Journal of |
| | | Pharmacy, 2(4), 327-332. |
| | 3. | Usman, MM, Dadrasnia, A., Lim, KT, Mahmud, AF, & |
| | | Ismail, S. (2016). Application of biosurfactants in |
| | | environmental biotechnology; remediation of oil and |
| | | heavy metal. AIMS Bioengineering, 3(3), 289-304. |
| | 4. | El-Ramady, H., Abdalla, N., Fawzy, Z., Badgar, K., Llanaj, |
| | | X., Törős, G., & Prokisch, J. (2022). Green |
| | | Biotechnology of Oyster Mushroom (Pleurotus ostreatus |
| | | L.): A Sustainable Strategy for Myco-Remediation and |
| | | Bio-Fermentation. Sustainability, 14(6), 3667. |
| | 5. | Munaweera, ICT, Jayawardana, NU, Rajaratnam, R., & |
| | | Dissanayake, N. (2022). Modern plant biotechnology as a |
| | | strategy in addressing climate change and attaining food |
| | | security. Agriculture & Food Security, 11(1), 1-28. |
| Date of amendment | 1 Seot | ember 2022 |

Module Handbook of Urban Farming

| Designation module | Land conversion is occurring so rapidly, resulting in increasingly |
|-----------------------------|---|
| | limited land that can be used for plant cultivation. Urban areas |
| | are synonymous with limited land that can be used for |
| | cultivating plants. The solution that can be taken is to utilize |
| | limited land as a place for cultivating plants through plant |
| | cultivation techniques on narrow land. The Urban Agriculture |
| | course is an elective course that teaches agricultural systems |
| | using limited land. In this course, apart from providing the theory |
| | of cultivating plants on limited land, practice is also carried out |
| | to support students' skills. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 677 |
| | |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Dr. Ir. Lis Noer Aini, SP, M.Sc. |
| module | |
| Lecturers | 1. Dr. Lis Noer Aini, SP, M. Si. |
| | 2. Ir. Hariyono, MP |
| | 3. Ir. Sukuriyati Susilo Dewi, MP |
| Language | Indonesian |
| Relation to curriculum | Elective Subjects for the 5th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Self Directed Learning |
| | 3. Brainstorming |
| | |

| | 5. Discovery Learning |
|---------------------|---|
| | 6. Simulation |
| | 7. Project Based Learning |
| Workloads | 1 CREDITS = 170 minutes x 16 meetings |
| | = 2.720 minutes |
| | = 45,33hours |
| | 3 CREDITS = 3 x 45,33hours |
| | = 136 hours |
| | Workload = 136 hours/ 30 hours = 4,53 ECTS |
| Credit points | 3 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to evaluate the implementation of agricultural systems and |
| learning outcomes | cultivation technology |
| | Course Learning Outcomes |
| | 1. Able to analyze profitable plant cultivation systems |
| | 2. Able to apply a narrow land crop cultivation system |
| | Lesson Learning Outcomes |
| | 1. Able to analyze profitable plant cultivation systems on |
| | limited land |
| | 2. Able to apply plant cultivation technology on narrow land |
| | 3. Able to apply modern plant cultivation technology |
| Content | 1. Verticulture |
| | 2. NFT |
| | 3. Hydroponics |
| | 4. Tabulampot |

| | 5. Aeroponics |
|---------------------------|--|
| | 6. Bonsai plant |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | Swastika, S., Yulfid, A., Sumitro, Y. 2017. Technical Manual for |
| | Hydroponic Vegetable Cultivation. Agricultural Technology |
| | Assessment Center. Riau. |
| Date of amendment | 1 September 2023 |

Module Handbook of Soil and Crops Analysis

| Designation module | Soil and plant analysis is needed to determine the nutrient status |
|-----------------------------|---|
| | and condition of soil fertility and nutrient uptake in plants. This |
| | course provides knowledge about how to take soil samples and |
| | plant tissue to measure their nutrient status, how to analyze |
| | nutrient content, and how to determine nutrient status. The |
| | practicum is carried out to provide students with expertise in |
| | determining the nutritional status of soil and plants |
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 678 |
| | |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Ir. Mulyono, MP |
| module | |
| Lecturers | 1. Dr. Lis Noer Aini, SP, M. Si. |
| (Supporting lecturer) | 2. Dr. Ir. Gunawan Budiyanto, MP |
| | 3. Ir. Mulyono, MP |
| Language | Indonesian |
| Relation to curriculum | Selected subjects for the 5th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Lecture |
| hours | 2. Self Directed Learning |
| | 3. Brainstorming |
| | 4. Contextual Learning |
| | 5. Small Group Discussion |
| | 6. Practice |
| | |

| Workloads | 1 credit = 170 minutes x 16 meetings |
|---------------------|---|
| | = 2,720 minutes |
| | = 45.33 hours |
| | 3 credits = 3 x 45.33 hours |
| | = 136 hours |
| | Workload = 136 hours/ 30 hours = 4.53 ECTS |
| Credit points | 3 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to apply technology in agricultural systems |
| learning outcomes | Course Learning Outcomes |
| | 1. Able to understand and take soil and plant samples |
| | according to scientific principles |
| | 2. Able to carry out soil analysis according to procedures |
| | 3. able to carry out plant tissue analysis according to plant |
| | type and age |
| | Lesson Learning Outcomes |
| | 1. Able to take soil and tissue samples properly and |
| | correctly to support effective plant cultivation |
| | 2. Able to carry out soil analysis, both physical and chemical, |
| | according to procedures |
| | 3. Able to carry out plant tissue analysis according to |
| | procedures for different types and ages of plants |
| | |
| Content | 1. Macronutrient analysis |
| | 2. Micronutrient analysis |

| | 3. Macronutrient uptake analysis |
|---------------------------|--|
| | 4. Micronutrient uptake analysis |
| | 5. Plant tissue analysis |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Sulaeman, Suparto, Eviati. 2005. Technical Instructions for |
| | Chemical Analysis of Soil, Plants, Water and Fertilizer. Soil |
| | Research Institute. Agricultural Research and Development |
| | Agency. Agriculture |
| | department. <u>http://balittanah.litbang.deptan.go.id</u> |
| | 2. Soil Science basics book |
| Date of amendment | 1 September 2022 |

Module Handbook of Diagnosis of Plant Diseases

| Designation module | Plant Disease Diagnosis (KL 676) is a course that discusses the |
|-----------------------------|---|
| | principles and procedures for diagnosing diseases that attack |
| | plants. The study material in this course focuses on the basic |
| | concepts of disease diagnosis, the stages of implementation for |
| | various types of diseases and procedures for evaluating disease |
| | incidence in plants. After taking this course, students are |
| | expected to (1) be able to carry out plant disease diagnosis |
| | procedures, and (2) be able to operate event surveys and |
| | forecast disease development in the field. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 676 |
| | |
| Semester(s) in which the | 5 |
| module is taught | |
| Person responsible for the | Dr. Siti Nur Aisyah, SP |
| module | |
| Lecturers | 1. Taufiq Hidayat, SP, M.Sc. |
| (Supporting lecturer) | 2. Dr. Siti Nur Aisyah, SP |
| Language | Indonesian |
| Relation to curriculum | Selected subjects for the 5th Semester Agrotechnology Study |
| | Program |
| Type of teaching, contact | 1. Interactive lecture |
| hours | 2. Mini projects |
| | 3. Small group discussions |
| | 4. Discovery learning |
| | |
| Workloads | 1 credit = 170 minutes x 16 meetings |

| | = 2,720 minutes |
|---------------------|--|
| | = 45.33 hours |
| | 2 credits = 2 x 45.33 hours |
| | = 90.67 hours |
| | Workload = 90.67 hours / 30 hours = 3.02 ECTS |
| Credit points | 2 credits |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to apply technology in agricultural systems |
| learning outcomes | Course Learning Outcomes |
| | 1. Able to carry out plant disease diagnosis procedures |
| | 2. Able to operate event surveys and forecast disease |
| | development in the field |
| | Lesson Learning Outcomes |
| | 1. Able to carry out diagnostic procedures for plant diseases |
| | caused by plant pathogenic fungi and bacteria |
| | 2. Able to determine appropriate diagnostic methods for |
| | plant pathogenic viruses and nematodes |
| | 3. Able to operate measurements and forecast disease |
| | development in the field |
| Content | 1. Basic principles and general procedures in plant disease |
| | diagnosis activities |
| | 2. Fungal-caused plant diseases diagnostic procedure |
| | 3. Procedure for diagnosing plant diseases caused by |
| | bacteria |
| | 4. Procedure for diagnosing plant diseases caused by |

| | nematodes |
|---------------------------|--|
| | 5. Procedure for diagnosing plant diseases caused by viruses |
| | 6. Evaluation of plant disease incidence in the field |
| | |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Agrios, G. N. (2005). Introduction to plant pathology. |
| | Elsevier Academic Press Publications |
| | 2. Fang, Y., & Ramasamy, R. (2015). Current and prospective |
| | methods for plant disease detection. Biosensors, 5(3), 537- |
| | 561 |
| | 3. Ray, M., Ray, A., Dash, S., Mishra, A., Achary, K. G., Nayak, |
| | S., & Singh, S. (2017). Fungal disease detection in plants: |
| | Traditional assays, novel diagnostic techniques and |
| | biosensors. Biosensors and Bioelectronics, 87, 708-723 |
| | 4. McCartney, H. A., Foster, S. J., Fraaije, B. A., & Ward, E. |
| | (2003). Molecular diagnostics for fungal plant pathogens. |
| | Pest Management Science: formerly Pesticide Science, |
| | 59(2), 129-142 |
| | 5. Bebber, D. P., & Gurr, S. J. (2015). Crop-destroying fungal |
| | and oomycete pathogens challenge food security. Fungal |
| | Genetics and Biology, 74, 62-64 |
| | 6. Rubio, L., Galipienso, L., & Ferriol, I. (2020). Detection of |
| | plant viruses and disease management: Relevance of |
| | genetic diversity and evolution. Frontiers in plant science, |
| | 11, 1092. |
| | |

| | 7. | Lane, L. C. (2019). A general method for detecting plant |
|-------------------|-----|---|
| | | viruses. In Plant Diseases of Viral, Viroid, Mycoplasma and |
| | | Uncertain Etiology (pp. 1-17). CRC Press. |
| | 8. | Hallmann, J., & Subbotin, S. A. (2018). Methods for |
| | | extraction, processing and detection of plant and soil |
| | | nematodes. Plant Parasitic Nematodes in Subtropical and |
| | | Tropical Agriculture, 3rd ed.; Sikora, R.A., Coyne, D., |
| | | Hallmann, J., Timper, P., Eds, 87-119. |
| | 9. | Ahuja, A., & Somvanshi, V. S. (2021). Diagnosis of plant- |
| | | parasitic nematodes using loop-mediated isothermal |
| | | amplification (LAMP): A review. Crop Protection, 147, |
| | | 105459. |
| | 10. | Mesa-Valle, C.M., Garrido-Cardenas, J.A., Cebrian- |
| | | Carmona, J., Talavera, M., & Manzano-Agugliaro, F. (2020). |
| | | Global research on plant nematodes. Agronomy, 10(8), |
| | | 1148. |
| | 11. | Bock, C.H., Barbedo, J.G., Del Ponte, E.M., Bohnenkamp, |
| | | D., & Mahlein, A.K. (2020). From visual estimates to fully |
| | | automated sensor-based measurements of plant disease |
| | | severity: status and challenges for improving accuracy. |
| | | Phytopathology Research, 2(1), 1-30. |
| | 12. | Lovell, D.J., Powers, S.J., Welham, S.J., & Parker, S.R. |
| | | (2004). A perspective on the measurement of time in plant |
| | | disease epidemiology. Plant Pathology, 53(6), 705-712. |
| | | |
| Date of amendment | 1 S | eptember 2022 |
| | | |

Module Handbook of Tropical Agriculture

| Designation module | International Tropical Farming Summer School (ITFSS) is an |
|-----------------------------|--|
| | annual event organized by the Department of Agrotechnology in |
| | collaboration with the International Association of Students in |
| | Agricultural and Associated Sciences (IAAS) and the |
| | Agrotechnology Student Association (HIMAGRO) UMY. ITFSS is a |
| | unique summer school program that combines academic and |
| | student activities. The aim of holding this Summer School is to |
| | expand students' knowledge about emerging tropical farming, be |
| | able to solve tropical agricultural problems in the field, case |
| | studies in the Modified Problem Based Learning (PBL) system. |
| | This program will be carried out through online activities. These |
| | online activities include public lectures, virtual tours and group |
| | discussions on sustainable tropical agriculture. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | |
| | |
| Semester(s) in which the | ? |
| module is taught | |
| Person responsible for the | Taufiq Hidayat, SP, M.Sc. |
| module | |
| Lecturers | ? |
| (Supporting lecturer) | |
| Language | Indonesian |
| Relation to curriculum | Selected subjects for the Agrotechnology Study Program |
| | |
| Type of teaching, contact | There is no RPS yet |
| hours | |

| Workloads | ? |
|---------------------------|--|
| Credit points | ? |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | CLO (COURSE LEARNING OUTCOMES) and PLO |
| objectives/intended | |
| learning outcomes | |
| Content | Lesson Learning Outcomes |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | |
| | |

Module Handbook of Post-Harvest Product Analysis

| Designation module | |
|-----------------------------|--|
| Module level, if applicable | Undergraduate |
| Code, if applicable | CL 673 |
| Semester(s) in which the | |
| module is taught | |
| Person responsible for the | Ir. Nafi Ananda Utama, MS |
| module | |
| Lecturers | |
| (Supporting lecturer) | |
| Language | Indonesian |
| Relation to curriculum | Elective courses. Related to Post-Harvest Physiology, Post- |
| | Harvest Technology, Courses |
| Type of teaching, contact | See the forms/learning strategies section in RPS |
| hours | |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 3 credits = 3 x 45.33 hours |
| | = 136 hours |
| | Workload = 136 hours/ 30 hours = 4.53 ECTS |
| Credit points | 3 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Course Learning Outcomes |
| objectives/intended | Able to carry out research using equipment with appropriate |

| learning outcomes | procedures. |
|---------------------------|--|
| | Lesson Learning Outcomes |
| | 1. Able to operate equipment for post-harvest analysis of |
| | agricultural products |
| | 2. Able to design research procedures using analytical |
| | equipment |
| Content | 1. Analysis Tools |
| | |
| | 2. Advanced analytical testing procedure |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | |
| Date of amendment | 1 September 2022 |

Module Handbook of Landscape Management

| Designation module | Landscape Management is an elective course offered to 6th |
|-----------------------------|---|
| | semester students with credits 2/0. This course is part of the |
| | supporting competency which covers the area of regional |
| | planning and land evaluation, given as strengthening or |
| | supporting material for students who have an interest in the |
| | area of regional planning and land evaluation. It is hoped that |
| | the material presented can provide additional understanding of |
| | landscapes and their functions in landscape development in both |
| | agricultural and non-agricultural sectors. The material provided |
| | consists of 4 topics, namely Scope of Landscape Management, |
| | Agricultural and Non-Agricultural Landscape Management, |
| | Evaluation of Land for Agriculture, and Evaluation of Land for |
| | Non-Agriculture. Lecture patterns are carried out either through |
| | face-to-face, online lectures, or independent assignments. At the |
| | end of the course, a written competency test is carried out based |
| | on the material provided and the assignments carried out. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KP 668 |
| | |
| Semester(s) in which the | |
| module is taught | |
| Person responsible for the | Dr. Lis Noer Aini, SP, M.Sc. |
| module | |
| Lecturers | Dr. Lis Noer Aini, SP, M.Sc. |
| (Supporting lecturer) | |
| Language | Indonesian |
| Relation to curriculum | Elective courses. Related to Landscape Design, Landscape |

| | Analysis and Planning Courses |
|---------------------------|---|
| Type of teaching, contact | Self Directed Learning |
| hours | Contextual Learning |
| | Small Group Discussion |
| Workloads | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 2 credits = 2 x 45.33 hours |
| | = 90.67 hours |
| | Workload = 90.67 hours / 30 hours = 3.02 ECTS |
| Credit points | 2 |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to evaluate the implementation of agricultural systems and |
| learning outcomes | cultivation technology |
| | COURSE LEARNING OUTCOMES |
| | 1. Able to analyze landscape management concepts for |
| | certain uses effectively according to applicable |
| | regulations |
| | 2. Able to evaluate land use according to the needs and |
| | objectives of its use |
| | Lesson Learning Outcomes |
| | 1. Able to understand the scope of landscape management, |
| | both for agricultural and non-agricultural sectors |
| | 2. Able to analyze landscape management problems |
| | 3. Able to evaluate agricultural landscapes and |

| | communicate effectively. |
|---------------------------|--|
| | 4. Able to evaluate non-agricultural landscapes |
| | 5. Able to carry out landscape management according to |
| | applicable regulations |
| Content | 1. Landscape and agriculture relationship |
| | 2. Evaluation of agricultural and non-agricultural landscapes |
| | 3. Applying landscape |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. Plants in the Landscape – Carpenter et all, 2008 – WH |
| | Freeman & Co. San Francisco |
| | 2. Landscape Handbook for the Tropics – Hill, 1995 – |
| | Garden Art Press New York |
| | 3. Landscape Architecture - Simond, 2003 |
| | |
| Date of amendment | 1 September 2022 |

Module Handbook of Horticultural Plant Cultivation

| Designation module | The Horticultural Plant Cultivation course studies the Cultivation |
|-----------------------------|---|
| | of Horticultural Plants which include ornamental plants, |
| | vegetables and fruit. Apart from that, this course studies the |
| | characteristics of horticultural plants, types and functions of |
| | horticultural plants. Discussion of horticultural plant cultivation |
| | is given specifically according to plant characteristics. The |
| | cultivation of horticultural crops on a small and large scale is also |
| | studied at the end of this course. |
| Module level, if applicable | Undergraduate |
| Code, if applicable | KL 669 |
| | |
| Semester(s) in which the | |
| module is taught | |
| Person responsible for the | Innaka Ageng Rineksane, SP, MP, Ph.D. |
| module | |
| Lecturers | 1. Innaka Ageng Rineksane, SP, MP, Ph.D. |
| (Supporting lecturer) | 2. Ir. Titiek Widyastuti, MS |
| | 3. Ir. Sukuriyati Susilo Dewi, MS |
| Language | Indonesian |
| Relation to curriculum | Elective courses. |
| Type of teaching, contact | 1. Self Directed Learning |
| hours | 2. Problem based learning |
| Workloads | 2 |
| Credit points | 1 credit = 170 minutes x 16 meetings |
| | = 2,720 minutes |
| | = 45.33 hours |
| | 2 credits = 2 x 45.33 hours |

| | = 90.67 hours |
|---------------------|--|
| | Workload = 90.67 hours / 30 hours = 3.02 ECTS |
| Requirements | To pass the subject, the minimum attendance is 80% and collect |
| | all the assignments given |
| Recommended | |
| prerequisites | |
| Module | Learning Outcomes |
| objectives/intended | Able to master the principles of agricultural cultivation |
| learning outcomes | technology in accordance with GAP |
| | Course Learning Outcomes |
| | 1. Able to categorize horticultural plants based on type and |
| | function |
| | 2. Able to analyze the development potential of ornamental |
| | plants and their cultivation aspects |
| | 3. Able to analyze the development potential of vegetable |
| | plants and their cultivation aspects |
| | 4. Able to analyze the development potential of fruit plants |
| | and their cultivation aspects |
| | Lesson Learning Outcomes |
| | 1. Able to classify horticultural plants |
| | 2. Able to describe the types and functions of horticultural |
| | plants |
| | 3. Able to project the potential for ornamental plant |
| | production in Indonesia |
| | 4. Able to plan aspects of ornamental plant cultivation |
| | starting from seed preparation to post-harvest |
| | 5. Able to project the potential for vegetable crop |
| | production in Indonesia |
| | 6. Able to plan aspects of vegetable cultivation starting from |

| | seed preparation to post-harvest |
|---------------------------|--|
| | 7. Able to project the production potential of fruit crops in |
| | Indonesia |
| | 8. Able to plan aspects of cultivating fruit plants from seed |
| | preparation to post-harvest |
| Content | |
| | 1. Prospects and introduction to horticultural cultivation |
| | technology |
| | 2. Cultivation of tea plants |
| | 3. Cultivation of coffee plants |
| | 4. Rubber cultivation |
| | 5. Cocoa cultivation |
| | 6. Oil palm cultivation |
| | |
| Study and examination | Lectures, projects, self-study, assignments, quizzes |
| requirements and forms of | |
| examination | |
| Media employed | Laptop, LCD, Ms. Office, Wi-Fi, MyKlass, stationary, white board |
| Reading list | 1. CR Adams, FM Bamford and MP Early. 2008. Principles of |
| | Horticulture. fifth edition. Elsevier |
| | 2. GSK Swamy and J. Auxilia. Fundamentals of Horticulture. |
| | Agrimoon.com |
| | 3. Thorat, S. et.al. 2019. Horticulture Nursery Management. |
| | The Registrar. Yashwantrao Chavan Mahashtra Open |
| | Univ. Nashik |
| | 4. Widyastuti, T., 2017. Ornamental Plant Cultivation |
| | Technology and Agribusiness. Mine. Yogyakarta |
| | 5. Statistics of Indonesian Seasonal Vegetable and Fruit |
| | |
| | Crops |


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