MODULE HANDBOOK

BARCHELOR OF AGROECHOTECHNOLOGY

Faculty Of Agriculture
Mulawarman University

Tabel Of Content

Semester I

<table>
<tr><td>Module name</td><td>Religious Education</td></tr>
<tr><td>Module level</td><td>Bachelor Programme</td></tr>
<tr><td>Code</td><td>MU000060W001</td></tr>
<tr><td>Subtitle, if applicable</td><td></td></tr>
<tr><td>Courses, if applicable</td><td>Reguler</td></tr>
<tr><td>Semester</td><td>I (First)</td></tr>
<tr><td>Person responsible for the module</td><td>Muhamad Ridwan, M. SI</td></tr>
<tr><td>Lecturer</td><td>Muhamad Ridwan, M. SI
Dr.Ir.Surya Sila,M.P
Dr.Ana Margaretta T, S.PAK, M.Si., M.Th
Lorensius, S.Pd.,M.Pd
Kadek Subagiada, S.Si., M.Si</td></tr>
<tr><td>Language</td><td>Bilingual (Indonesian, English and Arabic)</td></tr>
<tr><td>Relation to curriculum</td><td>Compulsory</td></tr>
<tr><td>Type of teaching, contact hours</td><td>Lecture and Practical</td></tr>
<tr><td rowspan="2">Workload</td><td>Number of meetings per semester 16 meetings
(14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)</td></tr>
<tr><td>Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester</td></tr>
<tr><td rowspan="2">Credit point</td><td>3 SKS (4.8 ECTS)</td></tr>
<tr><td>Details:
1 Credit = 170 min / week
1 Credit = 170 min x 14 week = 2720 min / semester
1 ECTS = 28 h / semester
1 Credit = 2720/ 60 / 28 = 1.6 ECTS
3 Credit = 1.6 x 3 = 4.8 ECTS</td></tr>
<tr><td>Recommended prerequisites</td><td></td></tr>
<tr><td>Module Objectives/ Intended Learning Outcomes</td><td>After attending this course, students have the ability to:
CLO 1 : explain and analyze religious education material.
CLO 2 : apply religius teachings as a source value in professional and personality development</td></tr>
<tr><td>Content</td><td>Materials are adapted to each religion.</td></tr>
<tr><td>Study and Examination Requirements and Forms of Examination</td><td>Evaluation and assessment of thelearning process are following Scheme 1 in the Academic Regulations of Mulawarman University:
<table>
<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
<tr><td>1</td><td>Affective</td><td>Participation</td><td>10</td></tr>
<tr><td>2</td><td>Task</td><td>Study group presentations, Q&A</td><td>10</td></tr>
<tr><td>3</td><td>Practises</td><td>Report</td><td>20</td></tr>
<tr><td>4</td><td>Mid-semester test</td><td>Written test</td><td>20</td></tr>
</table></td></tr>
</table>

	5	Final semester test	Written test	40
	TOTAL			100
Media Employed	Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)			
Reading list	1. Anshari, E. S. 1992. Kuliah al-Islam. Rajawali. 2. Hanafi, Y. 2022. Internalisasi Nilai-nilai Moderasi Beragama dalam Perkuliahan Pendidikan Agama Islam pada Perguruan Tinggi. Delta Pijar Khatulistiwa. 3. Husaini, A. 2015. Agama Islam: Panduan menjadi Cendekiawan Mulia dan Bahagia. Pro-U Media. 4. Iberani, J. S. 2003. Mengenal Islam. el-Kahfi. 5. Nurwardani, P. 2016 . Pendidikan Agama Islam Untuk Perguruan Tinggi. Direktorat Pembelajaran dan Kemahasiswaan Dirjen Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan. 6. Rahmat, Munawar. 2018. Model Perkuliahan Pendidikan Agama Islam yang Damai, Moderat, dan Toleran. Nadwa: Jurnal Pendidikan Islam. , Vol. 12, No. 1. 7. Ramdhani & M. Ali. 2021. Moderasi Beragama Berlandaskan Nilai-nilai Islam. Direktorat Jenderal Pendidikan Agama Islam Kementerian Agama RI. 8. Shihab, M. Q. 1996. Wawasan Al-Quran. Mizan. 9. Shihab, M. Q. 2020. Wasathiyyah Wawasan Islam Tentang Moderasi Beragama. Lentera Hati. 10. Taufiq, A. 2016. Pendidikan Agama Islam: Pendidikan Karakter Berbasis Agama Islam. LPPMP UNS Surakarta.			

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Students are able to explain and analyze religious education material and personility development.

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1	3							

<table>
<tr><td>Module name</td><td>Pancasila</td></tr>
<tr><td>Module level</td><td>Bachelor Programme</td></tr>
<tr><td>Code</td><td>MU000063W002</td></tr>
<tr><td>Subtitle, if applicable</td><td></td></tr>
<tr><td>Courses, if applicable</td><td>Reguler</td></tr>
<tr><td>Semester</td><td>I (First)</td></tr>
<tr><td>Person responsible for the module</td><td>Nurul Puspita Palupi, S.P.,M.Si</td></tr>
<tr><td>Lecturer</td><td>Dr. Ir. Akhyar Roeslan, M.P</td></tr>
<tr><td>Language</td><td>Bilingual (Indonesian & English</td></tr>
<tr><td>Relation to curriculum</td><td>Compulsory</td></tr>
<tr><td>Type of teaching, contact hours</td><td>Lecture, lesson</td></tr>
<tr><td rowspan="2">Workload</td><td>Number of meetings per semester 16 meetings
(14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)</td></tr>
<tr><td>Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester</td></tr>
<tr><td rowspan="2">Credit point</td><td>2 SKS (3.2 ECTS)</td></tr>
<tr><td>Details:
1 Credit = 170 min / week
1 Credit = 170 min x 14 week = 2720 min / semester
1 ECTS = 28 h / semester
1 Credit = 2720/ 60 / 28 = 1.6 ECTS
2 Credit = 1.6 x 2 = 3.2 ECTS</td></tr>
<tr><td>Recommended prerequisites</td><td></td></tr>
<tr><td>Module Objectives/ Intended Learning Outcomes</td><td>Student has to explain Pancasila as the basis of the state, national ideology, philosophical system, ethical system and basic values for the development of science.</td></tr>
<tr><td>Content</td><td>This course examines Pancasila in historical studies, as the basis of the state, national ideology, philosophical system, ethical system and basis for the development of science.</td></tr>
<tr><td>Study and Examination Requirements and Forms of Examination</td><td>Evaluation and assessment of thelearning process are following scheme 5in the Academic Regulations ofMulawarman University: (Tanpa Praktikum)
<table>
<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
<tr><td>1</td><td>Affective</td><td>Participation</td><td>10</td></tr>
<tr><td>2</td><td>Task</td><td>Study group presentations, Q&A</td><td>20</td></tr>
<tr><td>3</td><td>Mid-semester test</td><td>Written test</td><td>30</td></tr>
</table></td></tr>
</table>

<table>
<tr><td></td><td>
<table>
<tr><td>4</td><td>Final semester test</td><td>Written test</td><td>40</td></tr>
<tr><td colspan="3">TOTAL</td><td>100</td></tr>
</table>
</td></tr>
<tr><td>Media Employed</td><td>Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)</td></tr>
<tr><td>Reading list</td><td>

Ali, Asa’ad Said. (2009). Negara Pancasila, Jalan Kemaslahatan Bersama. Jakarta: LP3S
Bahar, Saafroedin & Hudawati, Nanie (peny). (1998). Risalah Sidang BPUPKI dan PPKI. Jakarta. Sekretariat Negara RI.
Bourchier, David .(2007). Pancasila Versi Orde Baru dan Asal Muasal Negara Organis. Yogyakarta : Aditya Media dan PSP UGM.
Darmaputra, Eka .(1997). Pancasila antara Identitas dan Modernitas. Tinjauan Etis dan Budaya. Edisi ke-6. Jakarta: Gunung Agung
Darmodihardjo, Darji .(1981). Santiaji Pancasila. Surabaya: Pustaka Nasional
Huzaini, Adian. (2009). Pancasila bukan untuk Menindas Hak Konstitusional Umat Islam. Jakarta: Gema Insani Press.
Kemdiknas. (2010). Pendidikan Budaya dan Karakter Bangsa. Jakarta: Pusat Kurikulum, Balitbang, Kementerian Pendidikan Nasional
Kusuma, Ananda B. 2004. Lahirnya UUD 1945. Jakarta: Fakultas Hukum UI
Latif, Yudi.(2011). Negara Paripurna: Historiositas, Rasionalitas, Aktualitas Pancasila . Jakarta : Gramedia Pustaka Utama.
LPPKB.(2005). Pedoman Umum Implementasi Pancasila dalam kehidupan Bernegara. Jakarta: Cipta Prima Budaya.
Mubyarto .(Eds) (2004). Pancasila Dasar Negara, UGM dan Jati Diri Bangsa Indonesia . Yogyakarta: Pustep UGM
Panitia Lima. (1977). Uraian Pancasila . Jakarta: Penerbit Mutiara.
Pemerintah RI (2010). Desain Induk Pengembangan Karakter Bangsa 2010-2025. Jakarta : Pemerintah Republik Indonesia.
Pranarka, AMW. (1985). Sejarah Pemikiran Pancasila. Jakarta: CSIS.
PSP UGM & Yayasan Tifa.(Peny) (2008). Pancasila Dasar Negara, Kursus Presiden Soekarno tt Pancasila. Yogyakarta: Aditya Media.
Santoso, Listiono, dkk. (2003.) (de) konstruksi Ideologi Negara , Suatu Upaya Membaca Ulang Pancasila . Yogyakarta: ning Rat.
Santoso, Listiono, dkk. (2003.) Filsafat Ilmu Sosial, Ikhtiar Awal Pribumisasi Ilmu Ilmu Sosial . Yogyakarta: Gama Media
Silalahi.(2001). Dasar-Dasar Indonesia Merdeka Versi Para Pendiri Negara. Jakarta : Gramedia

</td></tr>
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	• Soeprapto, Maria Fajar Indrati. (1998). Ilmu Perundang-undangan . Yogyakarta : Kanisius • Suryono, Hassan, 2016, Pancasila berbasis Riset Tinjauan aspek historis, yuridis dan filosofis, LPPMP UNS. • Suseno, Franz Magnis. (1999). Etika Politik, Prinsip-Prinsip Moral Dasar Kenegaraan Modern. Jakrta : Gramedia • Suwarno, PJ. (1993). Pancasila Budaya Bangsa Indonesia. Penelitian Pancasila dengan Pendekatan Historis, Filosofis dan Sosio Yuridis • Tilaar, HAR. (2007). Mengindonesia. Etnisitas dan Identitas Bangsa Indonesia . Jakarta: Rineka Cipta. • Tim Penerbit Lima (2006) Memaknai Kembali Pancasila. Yogyakarta: Penerbit Lima. • Tim. 2016. Pendidikan Kewarganegaraan. Dirjen Belmawa Kemenristekdikti. • Usman, Oetojo & Alfian (ed). (1991). Pancasila sebagai ideologi. Jakarta : BP7 Pusat. • Winarno. (2017). Paradigma Baru Pendidikan Pancasila. Jakarta : Bumi Aksara.

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Students have to explain Pancasila as the basis of the state, national ideology, philosophical system, ethical system and basic values for the development of science.

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1		3						

Module name	Indonesian Language
Module level	Bachelor Programme
Code	MU000063W004
Subtitle, if applicable	
Courses, if applicable	Reguler
Semester	1
Person responsible for the module	Bayu Aji Nugroho, S.S.,M.HUM
Lecturer	Bayu Aji Nugroho, S.S.,M.HUM
Language	Bilingual (Indonesian & English
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture, lesson
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)
	Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester
Credit point	2 SKS (3.2 ECTS)
	Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2720 min / semester 1 ECTS = 28 h / semester 1 Credit = 2720/ 60 / 28 = 1.6 ECTS 2 Credit = 1.6 x 2 = 3.2 ECTS
Recommended prerequisites	
Module Objectives/ Intended Learning Outcomes	1. Mahasiswa mampu membedakan bahasa Indonesia yang baku dan tidak baku 2. Mahasiswa mampu menulis ilmiah sesuai kaidah. 3. Mahasiswa mampu menghasilkan karya ilmiah dengan bahasa Indonesia yang benar
Content	● Pengertian bahasa Indonesia yang baik dan benar, ● Dasar-dasar Bahasa Indonesia baku ● Kaidah ejaan dengan benar (EYD) ● Proses penalaran ilmiah secara memadai (penalaran induktif, deduktif, dan salah nalar ● Penyusunan paragraf dengan benar (pengertian, kegunaan, jenisjenis, syarat pembentukan, dan letak kalimat topik) ● Pemilihan topik dan judul penulisan ● Kerangka karangan - bentuk kerangka pola Organisasi ● Penyusunan karya tulis ilmiah (makalah/skripsi) dengan

<table>
<tr><td></td><td>tatacara yang benar
● Tata tulis ilmiah dengan benar
● Pembuatan surat resmi secara baik dan benar</td></tr>
<tr><td>Study and Examination Requirements and Forms of Examination</td><td>Evaluation and assessment of thelearning process are following scheme 5 in the Academic Regulations of Mulawarman University:
<table>
<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
<tr><td>1</td><td>Affective</td><td>Participation</td><td>10</td></tr>
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<tr><td>Media Employed</td><td>Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)</td></tr>
<tr><td>Reading list</td><td>1. Akhadiah, Sabarti, Maedar G. Arsjad , Sakura H. Ridwan. 1994. Pembinaan Kemampuan Menulis Bahasa Indonesi. Erlangga.
2. Arifin, E. Zaenal dan S. Amran Tasa. 1989. Cermat Berbahasa Indonesia untuk Perguruan Tinggi. PT Mediatama Sarana Perkasa.
3. Darmadi, K. 1996. Meningkatkan Kemampuan Menulis: Panduan untuk Mahasiswa dan Calon Mahasisw, Penerbit Andi.
4. Depdikbud. 1991. Surat-menyurat dalam Bahasa Indonesia, seri penyuluhan 2, Pusat Pembinaan dan Pengembangan Bahasa.
5. FP-UNS. 2021. Buku Pedoman Pembuatan Skripsi di masing-masing Fakultas, FP-UNS.
6. Hanafiah, A. H. 1998 Anda Ingin Jadi Pengarang?. Usaha Nasional.
7. Keraf, Gorys. 1980. Komposisi: Sebuah Pengantar Kemahiran Bahasa. Nusa Indah 34-51.
8. Moeliono, Anton. 1988. Komposisi: Sebuah Pengantar Kemahiran Bahasa. Balai Pustaka.
9. Pedoman Umum Ejaan Bahasa Indonesia yang Disempurnakan
10. Pedoman Umum Pembentukan Istilah
11. Razak, A. 1990. Kalimat Efektif, Struktur, Gaya, dan Variasi, PT Gramedia.
12. Suryawinata, Z. & I. Suyitno. 1991. Bahasa Indonesia untuk Ilmu Pengetahuan & Teknologi, YAS 39-73.
13. Widyamartaya, A. 1990. Seni Menuangkan Gagasan, Kanisius. Hlm. 7--76.</td></tr>
</table>

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Mahasiswa mampu membedakan bahasa Indonesia yang baku dan tidak baku

CLO 2	Mahasiswa mampu menulis ilmiah sesuai kaidah.
CLO 3	Mahasiswa mampu menghasilkan karya ilmiah dengan bahasa Indonesia yang benar

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1	2							
CLO 2			1					
CLO 3						2		

<table>
<tr><td>Module name</td><td>Introduction of Humid Tropical Agriculture Science</td></tr>
<tr><td>Module level</td><td>Bachelor Programme</td></tr>
<tr><td>Code</td><td>220301612W005</td></tr>
<tr><td>Subtitle, if applicable</td><td></td></tr>
<tr><td>Courses, if applicable</td><td>Reguler</td></tr>
<tr><td>Semester</td><td>I (First)</td></tr>
<tr><td>Person responsible for the module</td><td>Prof. Dr. Ir. Rusdinsyah, M.Si</td></tr>
<tr><td>Lecturer</td><td>Penny Pujowati, S.P., M.Si.
Dr. Ir. Akhyar Roeslan, M.P.
Dr. Hadi Pranoto, S.P.,M.P
Ir. Hj. Susylowati, M.P
Prof. Ir. Suyadi, M.S., Ph.D</td></tr>
<tr><td>Language</td><td>Bilingual (Indonesian & English</td></tr>
<tr><td>Relation to curriculum</td><td>Compulsory</td></tr>
<tr><td>Type of teaching, contact hours</td><td>Lecture, lesson</td></tr>
<tr><td rowspan="2">Workload</td><td>Number of meetings per semester 16 meetings
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<tr><td>Details:
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1 Credit = 170 min x 14 week = 2720 min / semester
1 ECTS = 28 h / semester
1 Credit = 2720/ 60 / 28 = 1.6 ECTS
2 Credit = 1.6 x 2 = 3.2 ECTS</td></tr>
<tr><td>Recommended prerequisites</td><td></td></tr>
<tr><td>Module Objectives/ Intended Learning Outcomes</td><td>● Students are able to explain the meaning of science, scientific ethics and agriculture broadly
● Students are able to explain supporting factors in the agricultural sector (planting media, environment and management)</td></tr>
<tr><td>Content</td><td>This course discusses the meaning of science, scientific ethics; definition of agriculture; crop production and development of agricultural science; sustainable agriculture; branches of agricultural science.</td></tr>
<tr><td>Study and Examination Requirements and</td><td>Evaluation and assessment of thelearning process are following scheme 5 in the Academic Regulations of Mulawarman University:
<table>
<tr><th>No.</th><th>Objects of</th><th>Forms of</th><th>Quantity</th></tr>
</table></td></tr>
</table>

Forms of Examination		**Assessment**	**Assessment**	**(%)**
	1	Affective	Participation	10
	2	Task	Study group presentations, Q&A	20
	3	Mid-semester test	Written test	30
	4	Final semester test	Written test	40
	TOTAL			100
Media Employed	Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)			
Reading list	1. Agustina, L., ,Dasar Nutrisi Tanaman,PT Rineka Cipta, Jakarta.,2004 2. Foth, H.D. ,Dasar-dasar Ilmu Tanah,Gadjah Mada University Press,1998 3. Melkote, R.S. ,Everett M Rogers and his contribution to the field of communication and social change in developing countries,Journal of Creative in ACommunication,1,1,2007, 4. Harjadi, Sri Setyati. ,Pengantar Agronomi,PT. Gramedia, Jakarta,1979 5. Sperling, L., J.A. Ashby, M.E. Smith, E. Weltzein dan S. McGuire.,A framework f or analyzing participatory plant breeding approachhes and results. ,Euphytica,1,122,2001, 6.Subejo,Sistem Penyuluhan di jepang: Konsep, Peran dan Perkembangan Penyuluhan Pertanian dan Pedesaan,UGM Press Yogyakarta ,2008.			

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO) :

CLO 1	Students are able to explain the meaning of science, scientific ethics and agriculture broadly
CLO 2	Students are able to explain supporting factors in the agricultural sector (planting media, environment and management)

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1		3						
CLO 2			2					

Module name	Fundamental of Microbiology
Module level	Bachelor Programme
Code	220301613W006
Subtitle, if applicable	
Courses, if applicable	Reguler
Semester	I (First)
Person responsible for the module	Ir. Sopialena, M.P.,Ph.D
Lecturer	Sofian, S.P.,M.Sc Dr. Ir. Ni'matuljannah Akhsan, M.P Andi Suryadi, S.P.,M.P
Language	Bilingual (Indonesian & English
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture, lesson and practical.
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)
	Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester
Credit point	3 SKS (4.8 ECTS)
	Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2720 min / semester 1 ECTS = 28 h / semester 1 Credit = 2720/ 60 / 28 = 1.6 ECTS 3 Credit = 1.6 x 3 = 4.8 ECTS
Recommended prerequisites	
Module Objectives/ Intended Learning Outcomes	Be able to explain the role of microorganisms to increase agricultural production in humid tropical regions.
Content	This course examines the history of the development of microbiology, microbial classification, groups of microorganisms and their main characteristics, the role of microorganisms in human life, structure and function of microbial cells, nutrition and metabolism as well as growth and control of microbial growth, bacterial genetics.
Study and Examination Requirements and Forms of Examination	Evaluation and assessment of thelearning process are following scheme 1in the Academic Regulations ofMulawarman University:(Berpraktikum)

No.	Objects of Assessment	Forms of Assessment	Quantity (%)

	1	Affective	Participation	10
	2	Task	Study group presentations, Q&A	10
	3	Practises	Report	20
	3	Mid-semester test	Written test	20
	4	Final semester test	Written test	40
	TOTAL			100
Media Employed	Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)			
Reading list	● Atlas, R.M. 1997. Principle of Microbiology, 2nd ed. WC Brown Publisher. USA ● Madigan, M.T., J.M. Martinko, and J.Parker. 2009. Brock Biology of Microorganisms. 12th ed. ● Prentice Hall International. Inc. USA ● Prescott, L.M., J.P. Harley, and D.A. Klein. 1999. Microbiology. 4th ed. WCB. McGraw-Hill, USA Tortora, G.J., B.R. ● Funke, and C.L. Case. 2007. Microbiology an introduction, 9th ed. Benjamin Cummings, USA			

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Be able to explain the role of microorganisms to increase agricultural production in humid tropical regions.

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1		3						

Module name	Agriculture Biology
Module level	Bachelor Programme
Code	220301612W008
Subtitle, if applicable	
Courses, if applicable	Reguler
Semester	I (First)
Person responsible for the module	Prof. Dr.sc.agr. Nurhasanah, SP. M.Si.
Lecturer	Dr. Ir. Syakhril, M.Si. Dr. Rabiatul Jannah, SP. MP. Kadis Mujiono, SP. MSc. PhD. Dr. Rosfiansyah, SP. MSi. Dr. Ir. Rudarmono, MP. Ir. M. Alexander Mirza, MP. Ir. Susylowati, MP. Ali Zainal Abidin Alaydrus, STP. MP.
Language	Bilingual (Indonesian and English Language)
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture, lesson, and practical
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)
	Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester
Credit point	2 SKS (3.2 ECTS)
	Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2720 min / semester 1 ECTS = 28 h / semester 1 Credit = 2720/ 60 / 28 = 1.6 ECTS 2 Credit = 1.6 x 2 = 3.2 ECTS
Recommended prerequisites	
Module Objectives/ Intended Learning Outcomes	1. Students are able to explain the biology of plant cells, tissues and organs. 2. Students are able to explain plant metabolism, plant growth and development. 3. Students are able to apply the plant classification system.
Content	Agricultural Biology lectures study plant cells, tissues and organs. Apart from that, we study the processes of photosynthesis, respiration, growth and development of plants. This course also

<table>
<tr><td></td><td>studies the plant classification system.</td></tr>
<tr><td>Study and Examination Requirements and Forms of Examination</td><td>Evaluation and assessment of thelearning process are following scheme 5in the Academic Regulations of Mulawarman University:
<table>
<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
<tr><td>1</td><td>Affective</td><td>Participation</td><td>10</td></tr>
<tr><td>2</td><td>Task</td><td>Study group presentations, Q&A</td><td>20</td></tr>
<tr><td>3</td><td>Mid-semester test</td><td>Written test</td><td>30</td></tr>
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<tr><td colspan="3">TOTAL</td><td>100</td></tr>
</table></td></tr>
<tr><td>Media Employed</td><td>Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)</td></tr>
<tr><td>Reading list</td><td>
Beck, C.B. 2006. An introduction to plant structure and development. Cambridge Univ. Press, Cambridge.
Dickinson, W. C. 2000. Integrative Plant Anatomy. Harcourt Academic Press, New York.
Evert, R.F. 2006. Esau’s Plant Anatomy. Wiley Interscience.
Hopkins, W.G. & Huner, N.P.A. 2004. Introduction to Plant Physiology 3rd ed. John Wiley & Sons, Inc.
Lersten, N.R. 2004. Flowering Plant Embryology. Blackwell Publishing.
Opick, H. & S.A. Rolfe. 2005. The Physiology of Flowering Plants. Cambridge Univ. Press 7.
Taiz, L. & Zeiger, E. 2006. Plant Physiology. 4th ed. Sinaueer Ass, Inc., Publ. Sunderland, Massachusetts
</td></tr>
</table>

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Students are able to explain the biology of plant cells, tissues and organs.
CLO 2	Students are able to explain plant metabolism, plant growth and development.
CLO 3	Students are able to apply the plant classification system.

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1		2						
CLO 2			3					
CLO 3				2				

Module name	Agroecology
Module level	Bachelor Programme
Code	220301612W007
Subtitle, if applicable	
Courses, if applicable	Reguler
Semester	I (First)
Person responsible for the module	Dr. Ir. Sadaruddin, MP.
Lecturer	Dr. Ir. Suria Darma Idris, MSi. Dr. Hadi Pranoto, SP. MP. Dr. Ir. Rudarmono, MP. Penny Pujowati, SP. MSi.
Language	Indonesia
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture and lesson
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)
	Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester
Credit point	2 SKS (3.2 ECTS)
	Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2720 min / semester 1 ECTS = 28 h / semester 1 Credit = 2720/ 60 / 28 = 1.6 ECTS 2 Credit = 1.6 x 2 = 3.2 ECTS
Recommended prerequisites	
Module Objectives/ Intended Learning Outcomes	● Students will be able to explain basic ecological concepts ● Students will be able to explaindevelopment and evolution of ecosystems.
Content	Agroecology discusses : ● the relationship between nature, humans, plants and animals; ● ecosystems, energy and biogeochemical cycles; ● population dynamics; ● population interaction in communication; ● development and evolution of ecosystems.
Study and Examination	Evaluation and assessment of thelearning process are following

<table>
<tr><td>Requirements and Forms of Examination</td><td>scheme 5 in the Academic Regulations ofMulawarman University:
<table>
<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
<tr><td>1</td><td>Affective</td><td>Participation</td><td>10</td></tr>
<tr><td>2</td><td>Task</td><td>Study group presentations, Q&A</td><td>20</td></tr>
<tr><td>3</td><td>Mid-semester test</td><td>Written test</td><td>30</td></tr>
<tr><td>4</td><td>Final semester test</td><td>Written test</td><td>40</td></tr>
<tr><td colspan="3">TOTAL</td><td>100</td></tr>
</table></td></tr>
<tr><td>Media Employed</td><td>Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)</td></tr>
<tr><td>Reading List</td><td>1. Ekologi Dasar I. BKS PTN Intim Halaman 1-12
2. Ekologi Dasar I. BKS PTN Intim Halaman 35-53; 14-35
3. Ekologi Dasar I. BKS PTN Intim Halaman 99-113, 117-157
4. Ekologi Dasar I. BKS PTN Intim Halaman 117-157
5. Ekologi Dasar I. BKS PTN Intim Halaman 159-207
6. Ekologi Dasar I. BKS PTN Intim</td></tr>
</table>

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Students will be able to explain basic ecological concepts
CLO 2	Students will be able to explaindevelopment and evolution of ecosystems.

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8

Module name	Information Management System
Module level	Bachelor Programme
Code	220301612W008
Subtitle, if applicable	
Courses, if applicable	Reguler
Semester	I (First)
Person responsible for the module	Yoga Toyibulah, S.Si., M.Sc.
Lecturer	Medi Taruk, M.Cs Bambang Firdaus,M.Kom
Language	Indonesia
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture and practical
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)
	Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester
Credit point	2 SKS (3.2 ECTS)
	Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2720 min / semester 1 ECTS = 28 h / semester 1 Credit = 2720/ 60 / 28 = 1.6 ECTS 2 Credit = 1.6 x 2 = 3.2 ECTS
Recommended prerequisites	
Module Objectives/ Intended Learning Outcomes	● Able to explain the concept and scope of management information systems as part of improving the quality of life in society, nation, state and the progress of civilization based on Pancasila; ● Able to demonstrate a responsible attitude towards the work/assignments assigned independently, with quality and measurability by mastering and utilizing relevant information and communication technology principles and procedures to support the development of learning quality ● Able to make appropriate decisions in the context of completing independent/group tasks based on the results of information and data analysis and communicating the results both orally and in writing effectively.
Content	In this course, students learn about the scope of basic concepts of

<table>
<tr><td></td><td>Information Systems, information technology for excellence, management strategies that focus on the future, information technology from a company perspective, team frameworks in companies, the role of management information systems in decision making, implementation of Information Management Systems , and Information Systems and Technology Audit.</td></tr>
<tr><td>Study and Examination Requirements and Forms of Examination</td><td>Evaluation and assessment of thelearning process are following Scheme 5 in the Academic Regulations ofMulawarman University:
<table>
<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
<tr><td>1</td><td>Affective</td><td>Participation</td><td>10</td></tr>
<tr><td>2</td><td>Task</td><td>Study group presentations, Q&A</td><td>20</td></tr>
<tr><td>3</td><td>Mid-semester test</td><td>Written test</td><td>30</td></tr>
<tr><td>4</td><td>Final semester test</td><td>Written test</td><td>40</td></tr>
<tr><td colspan="3">TOTAL</td><td>100</td></tr>
</table></td></tr>
<tr><td>Media Employed</td><td>Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)</td></tr>
<tr><td>Reading list</td><td>

Rochaety, Eti. 2017. Sistem Informasi Manajemen. Jakarta: Mitra Wacana Media
Darmawan, Deni. Fauzi, K. N. 2016. Sistem Informasi Manajemen. Bandung: PT Remaja Rosdakarya
Zakiyudin, Ais. 2016. Sistem Informasi Manajemen. Jakarta: Prenadamedia Group
Siagian, Soandang. 2013. Sistem Informasi Manajemen. Bandung: Alfabeta.

</td></tr>
</table>

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Able to explain the concept and scope of management information systems as part of improving the quality of life in society, nation, state and the progress of civilization based on Pancasila;
CLO 2	Able to demonstrate a responsible attitude towards the work/assignments assigned independently, with quality and measurability by mastering and utilizing relevant information and communication technology principles and procedures to support the development of learning quality
CLO 3	Able to make appropriate decisions in the context of completing independent/group tasks based on the results of information and data analysis and communicating the results both orally and in writing effectively.

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1	2							
CLO 2		3						
CLO 3								3

Semester II

<table>
<tr><td>Module name</td><td>Fundamental of Genetic</td></tr>
<tr><td>Module level</td><td>Bachelor Programme</td></tr>
<tr><td>Code</td><td>220301622W006</td></tr>
<tr><td>Subtitle, if applicable</td><td></td></tr>
<tr><td>Courses, if applicable</td><td>Reguler</td></tr>
<tr><td>Semester</td><td>II (Second)</td></tr>
<tr><td>Person responsible for the module</td><td>Prof. Dr. Ir. Rusdiansyah, M.Si</td></tr>
<tr><td>Lecturer</td><td>1. Prof. Dr.sc.agr. Nurhasanah, SP. M.Si.
2. Dr. Ir. Syakhril, M.Si.
3. Dr. Ir. Ellok Dwi Sulichantini, M.Si.
4. Prof. Widi Sunaryo, SP. M.Si., Ph.D
5. Ir. Muhammad Saleh, M.Si.</td></tr>
<tr><td>Language</td><td>Bilingual (Indonesian & English Language)</td></tr>
<tr><td>Relation to curriculum</td><td>Compulsory</td></tr>
<tr><td>Type of teaching</td><td>Lecture and Lesson</td></tr>
<tr><td rowspan="2">Workload</td><td>Number of meetings per semester 16 meetings
(14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)</td></tr>
<tr><td>Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester</td></tr>
<tr><td rowspan="2">Credit points</td><td>2 SKS (3.2 ECTS)</td></tr>
<tr><td>Details:
1 Credit = 170 min / week
1 Credit = 170 min x 14 week = 2720 min / semester
1 ECTS = 28 h / semester
1 Credit = 2720/ 60 / 28 = 1.6 ECTS
2 Credit = 1.6 x 2 = 3.2 ECTS</td></tr>
<tr><td>Recommended Prerequisites</td><td></td></tr>
<tr><td>Module Objectives/ Intended Learning Outcomes</td><td>1. Students are able to explain the structure of organisms, cycles and chemical composition,
2. Students are able to explain the history of genetic development,
3. Students are able to explain the chemicals that make up their genetics</td></tr>
<tr><td>Content</td><td>This course explains the structure and development of organisms, the chemicals that make up their genetics, as well as the progress and development of genetics.</td></tr>
<tr><td>Study and Examination Requirements and Forms of</td><td>Evaluation and assessment of thelearning process are following scheme 5in the Academic Regulations of Mulawarman University:
<table>
<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
</table></td></tr>
</table>

Examination	1	Affective	Participation	10
	2	Task	Study group presentations, Q&A	20
	3	Mid-semester test	Written test	30
	4	Final semester test	Written test	40
	TOTAL			100
Media Pembelajaran	Notebook/Computer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)			
Referensi	1. Crowder, L.V. 1988. Plant Genetics. Terjemahan: Kusdiarti, Lilik: Genetika Tumbuhan. Gajah Mada Univ. Press 2. M. Apandi. Dasar-dasar Genetika. PT. Gelora Aksara Pratama, Bandung 3. PAI, A,C., 1985. Foundations of Genetics. Terjemahan 4. Yusuf M, 1998. Genetika Dasar I. Ekspansi Gen. PAU. IPB, Bogor			

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Students are able to explain the structure of organisms, cycles and chemical composition
CLO 2	Students are able to explain the history of genetic development
CLO 3	Students are able to explain the chemicals that make up their genetics

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1				2				
CLO 2		3						
CLO 3							3	

Module name	Agroclimatology
Module level	Bachelor Programme
Code	220301643W008
Subtitle, if applicable	
Courses, if applicable	Reguler
Semester	II (Second)
Person responsible for the module	Dr. Ir. A.Syamad Ramayana, M.P
Lecturer	1. Ir. Bambang Supriyanto, M.Si. 2. Dr. Ir. Suria Darma Idris, M.Si 3. RM. Nurhartanto, SP. M.Si
Language	Bilingual (Indonesian & English Language)
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture, lesson and practical
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)
	Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester
Credit point	3 SKS (4.8 ECTS)
	Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2720 min / semester 1 ECTS = 28 h / semester 1 Credit = 2720/ 60 / 28 = 1.6 ECTS 3 Credit = 1.6 x 3 = 4.8 ECTS
Recommended Prerequisites	
Module Objectives/ Intended Learning Outcomes	1. Able to understand the meaning of agroclimatology 2. Able to understand and recognize weather/climate elements, understand the role of weather elements in the agricultural sector 3. Able to understand and compile climate classifications based on weather data, understand and apply microclimate modifications for the agricultural sector 4. Able to understand the influence of global warming and climate change on agriculture
Contents	The material discussed in the lecture is: 1. Understanding of weather, climate, seasons, microclimate followed by the scope of Agroclimatology which explains the benefits and role of agroclimatology in the agricultural production process. the role of weather/climate elements.

<table>
<tr><td></td><td>2. Weather/climate elements: solar radiation, temperature, air pressure, wind, humidity, clouds, precipitation and evapotranspiration. The discussion of each weather element is accompanied by an explanation of its role on plants.
3. Climate classification.
4. Modification of microclimate.
5. Global warming
6. Climate change and its impact on agriculture and mitigation efforts through anticipation and adaptation.</td></tr>
<tr><td>Study and Examination Requirements and Forms of Examination</td><td>Evaluation and assessment of the learning process are following scheme 1 in the Academic Regulations of Mulawarman University:
<table>
<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
<tr><td>1</td><td>Affective</td><td>Participation</td><td>10</td></tr>
<tr><td>2</td><td>Task</td><td>Study group presentations, Q&A</td><td>10</td></tr>
<tr><td>3</td><td>Practises</td><td>Report</td><td>20</td></tr>
<tr><td>4</td><td>Mid-semester test</td><td>Written test</td><td>20</td></tr>
<tr><td>5</td><td>Final semester test</td><td>Written test</td><td>40</td></tr>
<tr><td colspan="3">TOTAL</td><td>100</td></tr>
</table></td></tr>
<tr><td>Media Employed</td><td>Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)</td></tr>
<tr><td>Reading list</td><td>

Ariyanto, D. P., Aziz, A., Komariah, K., Sumani, S., & Abara, M,Comparing the accuracy of estimating soil moisture using the
Ariyanto, D. P., Priswita, R. P. W., & Senge, M,Determining the wet season onset toward crop water availability under the tropical monsoon climate,IOP Conference Series:
Arora, N. K,Impact of climate change on agriculture production and its sustainable solutions, Environmental Sustainability,2,2,2019, :
Aryal, J. P., Sapkota, T. B., Khurana, R., Khatri-Chhetri, A., Rahut, D. B., & Jat, M. L,Climate change and agriculture in South Asia: Adaptation options in smallholder production systems,Environment, Development and Sustainability,22,6,2020, :
Bhermana, A., & Susilawati, S,Environmentally Sound Spatial Management Using Conservation and Land Evaluation Approach at Sloping Lands in Humid Tropic (A case study of Antang Kalang sub-district, Central Kalimantan, Indonesia),SAINS TANAH-Journal of Soil Science and Agroclimatology,16,1,2019, :
Budiastuti, M., Purnomo, D., Hendro, H., Sudjianto, U., & Gunawan, B,Rehabilitation of critical land by Implementing complex agroforestry at the prioritized subwatersheds in the Muria Region,Sains Tanah,17,1,2020, :
Budiastuti, M., Purnomo, D., Supriyono, Yunindanova, M. B., Mahardini, P., & Utami, R,Land management strategy for cocoa cultivation at home gardens Land management strategy for cocoa cultivation at home gardens,IOP Conference Series:

</td></tr>
</table>

- Budiastuti, Maria Theresia Sri,Agroforestri Sebagai Bentuk Mitigasi Perubahan Iklim,Seminar Nasional Magister Agroteknologi Fakultas Pertanian UPN “Veteran” Jawa Timur,Magister Agroteknologi Fakultas Pertanian UPN “Veteran” Jawa Timur,2020 :
- Budiastuti, S ., Purnomo D., Setyaningrum, D,Agroforestri Bentuk Pengelolaan Lahan Berwawasan Lingkungan,UNS Press,2021 :
- Budiastuti, S., Purnomo, D., Setyaningrum, D,Alam Semesta, Kehidupan dan Teknologi,UNS Press,2021 :
- Chang, J. H,Climate and agriculture: an ecological survey, Routledge, 2017.
- Chmura, H. E., Glass, T. W., & Williams, C. T,Biologging physiological and ecological responses to climatic variation: new tools for the climate change era,Frontiers in Ecology and Evolution,6,8,2018
- Earth and Environmental Science,200,1,2018, :
- Earth and Environmental Science,200,1,2018,IOP Publishing :
- Earth and Environmental Science,686,1,2021,IOP Publishing : Bartok, B., Telcian, A. S., S?c?rea, C., Horvath, C., Croitoru, A. E., & Stoian, V.,Regional Climate Models Validation for Agroclimatology in Romania,Atmosphere,12,8,2021, :
- Hatfield, J. L., Sivakumar, M. V., & Prueger, J. H,Agroclimatology ,John Wiley & Sons,2020 : Qonita, M,Agricultural planning based on local agro-climatology assessment in Bongkot, Purwodadi, Purworejo,IOP Conference Series:
- Heymann, M,The climate change dilemma: big science, the globalizing of climate and the loss of the human scale,Regional Environmental Change,19,6,2019, :
- Karimi, V., Karami, E., & Keshavarz, M,Climate change and agriculture: Impacts and adaptive responses in Iran,Journal of Integrative Agriculture,17,1,2018, :
- Komariah, Senge, M., Sumani, Dewi, W. S., Yoshiyama, K., & Rachmadiyanto, A. N,The Impacts of Decreasing Paddy Field Area on Local Climate in Central Java, Indonesia,Air, Soil and Water Research,8,ASWRS21560,2015, :
- Liu, C., Yang, C., Yang, Q., & Wang, J,Spatiotemporal drought analysis by the standardized precipitation index (SPI) and standardized precipitation evapotranspiration index (SPEI) in Sichuan Province, China,Scientific Reports,11,1,2021, :
- Murniati, K,The impact of climate change on the household food security of upland rice farmers in Sidomulyo, Lampung Province, Indonesia,Biodiversitas Journal of Biological Diversity,,21,8,2020, :
- Rondhi, M., Fatikhul Khasan, A., Mori, Y., & Kondo, T,Assessing the role of the perceived impact of climate change on national adaptation policy: the case of rice farming in Indonesia, Land,8,5,2019, :
- Shields, A. L,The climates of other worlds: A review of the emerging field of exoplanet climatology,The Astrophysical

	Journal Supplement Series,243,2,2019, : ● Standardized Precipitation Index (SPI) and the Standardized Precipitation Evapotranspiration Index (SPEI),AINS TANAH-Journal of Soil Science and Agroclimatology,17,1,2020, : ● Suheri, N. A., Mujiyo, M., & Widijanto, H,Land Suitability Evaluation for Upland Rice in Tirtomoyo District, Wonogiri Regency, Indonesia,SAINS TANAH-Journal of Soil Science and Agroclimatology,15,1,2018, : ● Venkatramanan, V., Shah, S., & Prasad, R,Global Climate Change and Environmental Policy,Springer Singapore,2020 : ● White, S., Pfister, C., & Mauelshagen, F,The Palgrave handbook of climate history,Palgrave Macmillan,2018 : ● Winsberg, E,Philosophy and climate science,Cambridge University Press,2018 : ● Zaki, M. K., Noda, K., Ito, K., Komariah, K., Sumani, S., & Senge, M,Adaptation to extreme hydrological events by javanese society through local knowledge,Sustainability,12,24,2020, :

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Able to understand the meaning of agroclimatology
CLO 2	Able to understand and recognize weather/climate elements, understand the role of weather elements in the agricultural sector
CLO 3	Able to understand and compile climate classifications based on weather data, understand and apply microclimate modifications for the agricultural sector

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1				3				
CLO 2							2	
CLO 3								2

Semester III

Module name	Soil Fertility and Fertilizer
Module level	Bachelor Programme
Code	190301603W025
Subtitle, if applicable	
Courses, if applicable	Reguler
Semester	3
Person responsible for the module	Dr. Ir. Fahrunsyah, MP.
Lecturer	Dr. Rabiatul Jannah, SP. MP. Roro Kusumaningwati, SP. MSc. Nurul Puspita Palupi, SP. MSi. Dr. Ria Rachel Paranoan, SP. MSc.
Language	Bilingual (Indonesian and English Language)
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture, lesson, practical
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)
	Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester
Credit point	3 SKS (4.8 ECTS)
	Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2720 min / semester 1 ECTS = 28 h / semester 1 Credit = 2720/ 60 / 28 = 1.6 ECTS 3 Credit = 1.6 x 3 = 4.8 ECTS
Recommended Prerequisites	
Module Objectives/ Intended Learning Outcomes	1. Able to Understand the meaning and concept of soil fertility 2. Able to Understand soil fertility analysis techniques 3. Able to Understand the relationship between nutrients and plant needs for optimal growth 4. Able to Understand macro and micro nutrients 5. Able to identify the right planting medium to support plant growth 6. Able to analyze the relationship between soil properties and the availability of nutrients for plants 7. Able to choose appropriate soil fertility management related to plant nutritional needs 1. Understand the meaning and concept of soil fertility 8. Understand soil fertility analysis techniques

<table>
<tr><td></td><td>9. Understand the relationship between nutrients and plant needs for optimal growth
10. Understand macro and micro nutrients
11. Able to identify the right planting medium to support plant growth
12. Able to analyze the relationship between soil properties and the availability of nutrients for plants
13. Able to choose appropriate soil fertility management related to plant nutritional needs</td></tr>
<tr><td>Contents</td><td>This course discusses the understanding and concept of soil fertility, soil fertility analysis techniques, relationships nutrients and plant needs for optimal growth, macro and micro nutrients, appropriate planting media for supports soil growth, analyzes the relationship between soil properties and the availability of nutrients for plants, as well as proper soil fertility management related to plant nutritional needs.</td></tr>
<tr><td>Study and Examination Requirements and Forms of Examination</td><td>Evaluation and assessment of thelearning process are following scheme 1in the Academic Regulations of Mulawarman University:
<table>
<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
<tr><td>1</td><td>Affective</td><td>Participation</td><td>10</td></tr>
<tr><td>2</td><td>Task</td><td>Study group presentations, Q&A</td><td>10</td></tr>
<tr><td>3</td><td>Practises</td><td>Report</td><td>20</td></tr>
<tr><td>3</td><td>Mid-semester test</td><td>Written test</td><td>20</td></tr>
<tr><td>4</td><td>Final semester test</td><td>Written test</td><td>40</td></tr>
<tr><td colspan="3">TOTAL</td><td>100</td></tr>
</table></td></tr>
<tr><td>Media Employed</td><td>Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)</td></tr>
<tr><td>Reading list</td><td>• Afandie, R and Nasih, W.Y. 2002. Soil Fertility Science. Canisius. Yogyakarta
• AK. 1983. Basics of Farming. Canisius. Yogyakarta
• Hasan, B.J. 2002. Agronomy. PT. Raja Grafindo Persada. Jakarta
• Henry, K.I. 1994. Soil Fertility Management. Literary Earth. Jakarta
• Loughnan,F.C. 1969. Chemical Weathering of the Silicate Minerals. American Elsevier Publ. Co., Inc. New York.</td></tr>
</table>

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Students are able to understand the meaning and concept of soil fertility
CLO 2	Students are able to understand soil fertility analysis techniques
CLO 3	Students are able to understand macro and micro nutrients and the relationship between nutrients and plant needs for optimal growth
CLO 4	Students are able to identify the right planting media to meet nutritional needs to support plant growth

	Program Learning Outcomes (PLO)

	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1	3							
CLO 2				3				
CLO 3							3	
CLO 4								1

Module name	Plant Physiology
Module level	Bachelor Programme
Code	220301633W003
Subtitle, if applicable	
Courses, if applicable	Reguler
Semester	III (Third)
Person responsible for the module	Dr. Ir. Syakhril, M.Si.
Lecturer	Ir. Elliyani, M.Si Dr. Odit Ferry Kurniadinata, S.P., M.Si. Ir. Yetti Elidar, M.P. Ir. Alvera Prihatini Dewi Nazari, M.Si Prof. Widi Sunaryo, S.P, M.Si., Ph.D.
Language	Bilingual (Indonesian & English Language)
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture, lesson and practical
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)
	Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester
Credit point	3 SKS (4.8 ECTS)
	Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2720 min / semester 1 ECTS = 28 h / semester 1 Credit = 2720/ 60 / 28 = 1.6 ECTS 3 Credit = 1.6 x 3 = 4.8 ECTS
Recommended Prerequisites	
Module Objectives/ Intended Learning Outcomes	1. Students are able to explain the structure and physiological processes of plants 2. Students are able to explain the internal and external factors that influence plant physiological processes
Content	Plant Physiology studies the scope and role of plant physiology, structure, properties and function of cells, plant tissues and organs, water and its functions, photosynthesis, transpiration, germination, plant growth and development, growth regulators, ecophysiology, plant stress.
Study and Examination	Evaluation and assessment of thelearning process are following scheme 1 in the Academic Regulations of Mulawarman University

<table>
<tr><td>Requirements and Forms of Examination</td><td>
<table>
<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
<tr><td>1</td><td>Affective</td><td>Participation</td><td>10</td></tr>
<tr><td>2</td><td>Task</td><td>Study group presentations, Q&A</td><td>10</td></tr>
<tr><td>3</td><td>Practises</td><td>Report</td><td>20</td></tr>
<tr><td>4</td><td>Mid-semester test</td><td>Written test</td><td>20</td></tr>
<tr><td>5</td><td>Final semester test</td><td>Written test</td><td>40</td></tr>
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</table>
</td></tr>
<tr><td>Media Employed</td><td>Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)</td></tr>
<tr><td>Reading list</td><td>

Bewley JD, Black M. 1983. Physiology and Biochemistry of Seeds in Relation to Germination. Vol 1 dan 2. Springer – Verlag. Berlin.
Campbell, Neil A; Mitchell, Lawrence G dan Reece, Jane B. 2004. Biologi Edisi Kelima Jilid 3. Erlangga. Jakarta.
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Devlin,R.M. 1975. Plant Phsiology. Third Edition. D. Van Nostrand, Company. New York.
Fitter, A.H. dan R.K.M. Hay. 1994. Fisiologi Lingkungan Tanaman (terjemahan). Gajahmada Univ. Press. Yogyakarta.
Gardner, F. P., R. B. Pearce, dan R. L. Mitchell. 1985. Physiology of Crop Plants. (Terjemahan Susilo, 1991. Jakarta: UI-Press).
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Nurdin, H. 1997. Buku Ajar Fisiologi Tumbuhan. Departement Pendidikan dan Kebudayaan Universitas Andalas Padang.
Salisbury FB, dan Ross CW. 1992. Plant Physiology. Wodsworth Publishing Company, Belmont-California.
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</td></tr>
</table>

	• Salisbury, F.B. and C.W. Ross. 1991. Plant Physiology 4th Edition. Wadsworth Publishing Company, Belmonth, CA. • Sasmitamihardja, Dardjat. 1996. Fisiologi Tumbuhan. Bandung: ITB. • Sutopo, L. 1993. Teknologi Benih. Rajawali Press. Jakarta. • Thomas J B. 1965. Primary Photoprocesses in Biology. Amesterdam: Nort-Holland Publishing Company. • Wilkins Malcolm B. 1989. Fisiologi Tanaman. Bumi Aksara. Jakarta.

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Students are able to explain the structure and physiological processes of plants
CLO 2	Students are able to explain the internal and external factors that influence plant physiological processes

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1				2				
CLO 2								1

Module name	Research Methodology
Module level	Bachelor Programme
Code	190301603W021
Subtitle, if applicable	
Courses, if applicable	Reguler
Semester	3
Person responsible for the module	Prof. Dr. Ir. Zulkarnain, MS.
Lecturer	Prof. Dr. Ir. Surya Darma, MSi. Ir. Eliyani, MSi. Ir. Alvera Prihatini DN, MSi. Dr. Hadi Pranoto, SP. MP.
Language	Bilingual (Indonesia dan English Language)
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture, lesson
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)
	Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester
Credit point	2 SKS (3.2 ECTS)
	Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2720 min / semester 1 ECTS = 28 h / semester 1 Credit = 2720/ 60 / 28 = 1.6 ECTS 2 Credit = 1.6 x 2 = 3.2 ECTS
Recommended Prerequisites	
Module Objectives/ Intended Learning Outcomes	After taking this course, it is hoped that students will be able to explain the background and intricacies of research starting from pre-preparation research, during research and preparation of results and research reports along with various aspects that cover them
Contents	The scope of this course includes research philosophy and concepts, research problems, research objectives and benefits, variables, design,population and samples, data collection, data analysis, data presentation and writing research proposals and results
Study and Examination Requirements and	Evaluation and assessment of the learning process are following Scheme 5 in the Academic Regulations of Mulawarman University:

Forms of Examination	**No.**	**Objects of Assessment**	**Forms of Assessment**	**Quantity (%)**
	1	Affective	Participation	10
	2	Task	Study group presentations, Q&A	20
	3	Mid-semester test	Written test	30
	4	Final semester test	Written test	40
	TOTAL			100
Media Employed	Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)			
Reading list	• Guidelines for Research Management at the Director General of DIKTI, 1994, Dikti, Jakarta • Marczyk, G., DeMateo, D., Festinger, D. 2005, Essentials of research design & methodology., John Wiley & Sons Inc., New Jersey • Saryono. 2010. Health Research Methodology. Cendikia Press Partners. Yogyakarta • Singarimbun, M and S. Efendi, 1989, Survey Research Methods, Pernerbit LP3ES, Jakarta • Suryabrata, s., 1992, Research Methodology, CV Rajawali, Jakarta			

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Students are able to explain the background and intricacies of the research
CLO 2	Students are able to prepare whatever preparations need to be made during pre-research, during research and compiling results
CLO 3	Students are able to prepare research reports along with the various aspects they include

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1				3				
CLO 2							3	
CLO 3								2

Module name	Biodiversity of Humid Tropical Plants
Module level	Bachelor Programme
Code	190301662W073
Subtitle, if applicable	
Courses, if applicable	Reguler
Semester	3
Person responsible for the module	Prof. Widi Sunaryo, SP. MSi.PhD.
Lecturer	Prof. Dr.sc.agr. Nurhasanah, SP. MSi. Ir. Muhammad Ssaleh, MSi. Dr. Odit Ferry Kurniadinata, SP. MSi.
Language	Indonesia
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture and Practical
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)
	Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester
Credit point	2 SKS (3.2 ECTS)
	Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2720 min / semester 1 ECTS = 28 h / semester 1 Credit = 2720/ 60 / 28 = 1.6 ECTS 2 Credit = 1.6 x 2 = 3.2 ECTS
Recommended Prerequisites	
Module Objectives/ Intended Learning Outcomes	1. Students are able to classify biodiversity and trigger the causes and consequences of its destruction 2. Students are able classify the types and benefits of germplasm and formulate criteria for its rarity 3. Students are able to transmit application of in-situ and ex-situ conservation methods 4. Students are able to spread the prospects of microbial and insect diversity as well as informatics with the surrounding ecosystem, both macro and micro ecosystems
Contents	This course discusses aspects of biological resources which include aspects of diversity, damage and threats to biological resources as a result the use of engineering technology and biodiversity management systems that do not pay attention to sustainable

<table>
<tr><td></td><td>principles, as well as finding alternative solutions to overcome these problems.</td></tr>
<tr><td>Study and Examination Requirements and Forms of Examination</td><td>Evaluation and assessment of thelearning process are following scheme 5 in the Academic Regulations ofMulawarman University:
<table>
<tr><th>No.</th><th>Objects of Assessment</th><th>Forms of Assessment</th><th>Quantity (%)</th></tr>
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<tr><td>Media Employed</td><td>Notebook/Komputer/Handphone, Zoom Meeting dan Mulawarman Online Learning System (MOLS)</td></tr>
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Bhaduriya S, Khandelwal M, Churasiya K, Rathore AK, Pareek A, Dubey A, Singh J,Plant Ecology, Plant Resources Utilization and Biodiversity Conservation,Vardhman Mahaveer Open University, Kota,2017
Hawksworth DL and Bull AT (Eds.),Plant Conservation and Biodiversity (Vol. 6),Springer. The Netherland,2007
Hawksworth DL and Bull AT (Eds.) ,Human Exploitation and Biodiversity Conservation (Vol. 8), Springer. The Netherland,2009
Meena VS, Mishra PK, Bisht JK, Pattanayak A (Eds.) ,Agriculturally Important Microbes for Sustainable Agriculture (Vol. I),Springer Nature. Singapore,2017
Meena VS, Mishra PK, Bisht JK, Pattanayak A (Eds.),Agriculturally Important Microbes for Sustainable Agriculture (Vol. II),Springer Nature. Singapore,2017
Milner-Gulland EJ and Rowcliffe JM,Conservation and Sustainable Use. A Handbook of Techniques,Oxford Univ. Press. New York,2007
Normah MN, Chin HF, Reed BM,Conservation of Tropical Plant Species,Springer. New York,2013
Peterson R and Lima N (Eds.),Bioprospecting - Success, Potential and Constraints,Springer Int. Publ. Switzerland,2017
Singh DP, Singh HB, Prabha R (Eds.),Plant ¿¿¿ Microbes Interaction in Agriculture Ecological Perspectives (Vol. I) ,Springer Nature. Singapore,2017
Slootweg R, Rajvanshi A, Mathur V and Kolhoff A,Biodiversity and Environmental Assesment,Cambridge Univ. Press. UK,2010
</td></tr>
</table>

MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Students are able to classify biodiversity and evaluate the causes and consequences of its damage
CLO 2	Students are able classify the types and benefits of germplasm and formulate criteria for its rarity

CLO 3	Students are able to evaluate application of in-situ and ex-situ conservation methods and prospects for microbial and insect diversity and their relationships with the surrounding ecosystem, both macro and micro ecosystems

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1		3						
CLO 2				2				
CLO 3						1		

Module name	Agricultural Mechanization
Module level	Undergraduate Programme
Code	190301633W0016
Subtitle, if applicable	
Courses, if applicable	Reguler
Semester	3
Person responsible for the module	Ir. Bambang Supriyanto, M.Si
Lecturer	Dr. Ir. A. Syamad Ramayana, M.P Ali Zainal Abidin Alaydrus, S.TP, MP Dr. Ir. Suria Darma Idris, M.Si. Prof. Dr. Ir. Zulkarnain, M.S Dr. Ir. Hamsyin, M.P RM. Nurhartanto, S.P., M.Si
Language	Bilingual (Indonesian and English)
Relation to curriculum	Compulsory
Type of teaching, contact hours	Lecture, lesson and practical
Workload	Number of meetings per semester 16 meetings (14 meetings for learning activity, 1 meeting for mid semester, 1 meeting for final examination)
	Total time of 2720 minutes or equivalent to a total of 45 hours in 14 weeks per semester
Credit point	3 SKS (4.8 ECTS)
	Details: 1 Credit = 170 min / week 1 Credit = 170 min x 14 week = 2720 min / semester 1 ECTS = 28 h / semester 1 Credit = 2720/ 60 / 28 = 1.6 ECTS 3 Credit = 1.6 x 3 = 4.8 ECTS
Recommended Prerequisites	
Module Objectives/ Intended Learning Outcomes	1. Students are able to explain the definition, scope, development and role of agricultural mechanization 2. Students are able to explain the types of resources and energy and their use in the agricultural sector 3. Students are able to explain agricultural tools and machines used in land processing, planting, maintenance, harvesting and post-harvest according to the principles of how they work 4. Students are able to determine agricultural tools and machines effectively and efficiently
Contents	This course studies the scope of agricultural mechanization, energy sources in the agricultural sector, the working principles of

<table>
<tr><td></td><td>combustion engines as driving force, tools and machines in clearing and cultivating land, tractors and their specifications, planting tools and machines, tools and machines in plant maintenance, principles pump work, harvesting/post-harvest tools and machines, pumps for agriculture, and machinery management.</td></tr>
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Amran, Adi dkk. 2018. Revolusi Mekanisasi Pertanian Indonesia. IAARD Press. Jakarta
Gunawan, Bambang. 2014. Mekanisasi Pertanian. Jaudar Press. Surabaya
Hadiutomo, Kusno, 2012. Mekanisasi Pertanian. IPB Press. Bogor
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Santoso, Dwi. 2023. Transformasi & Pengembangan Mekanisasi Pertanian di Kawasan Perbatasan. Media Aksara, Purbalingga
Suhendrata, Tota. 2016. Teknologi Mekanisasi. IAARDS Press, BPPP. Jakarta
Unadi, Astu. 2011. Mekanisasi Pasca Panen Padi di Indonesia. BBP Mektan. Tangerang
</td></tr>
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MAP OF COMPATIBILITY OF COURSE LEARNING OUTCOMES (CLO) AND PROGRAM LEARNING OUTCOMES (PLO)

CLO 1	Students are able to explain the definition, scope, development and role of agricultural mechanization
CLO 2	Students are able to explain the types of resources and energy and their use in the agricultural sector
CLO 3	Students are able to explain agricultural tools and machines used in land processing, planting, maintenance, harvesting and post-harvest along with their working principles
CLO 4	Students are able to determine agricultural tools and machines effectively and efficiently

	Program Learning Outcomes (PLO)							
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PLO 6	PLO 7	PLO 8
CLO 1		1						
CLO 2					2			
CLO 3					2			
CLO 4							3	