MODULE HANDBOOK

2025

AGROTECHNOLOGY STUDY PROGRAM

FACULTY OF AGRICULTURE
UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"
JAWA TIMUR

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SEMESTER 1

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Pancasila *Pancasila*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UV191101 *UV191101*
Kursus (jika ada) ***Course (if applicable)***	Pancasila *Pancasila*
Semester ***Semester***	I (Satu) 1 (*First*)
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Srie Muljani, MT.
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu*
Angka kredit ***Credit point***	2 SKS *2 credit or 3.2 ETCS*
Persyaratan sesuai ketentuan ujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menerapkan pemikiran yang logis, kritis, inovatif, bermutu, dan terukur juga mempunyai pola pikir berpikir secara komprehensif integralistik. Mahasiswa dapat menunjukkan kinerja mandiri maupun kolektif secara bermutu dan terukur. Mahasiswa mampu bertanggungjawab atas pencapaian hasil kerjanya. Mahasiswa mampu melakukan proses evaluasi diri terhadap kelompok kerjanya. Mahasiswa mampu mendokumentasi, menyimpan, mengamankan, dan menemukan kembali hasil karya untuk menjamin kesahihan dan mencegah plagiasi. *Students are capable to apply logical, critical, innovative, quality and measurable thinking and also have a comprehensive, integralistic mindset.* *Students can demonstrate independent and collective performance in a quality and measurable manner.* *Students capable to take responsibility for the achievement of their work.* *Students capable to carry out a self-evaluation process for their work group.* *Students capable to document, store, secure and retrieve their work to ensure validity and prevent plagiarism.*	CPL-1 CPL-2 CPL-3 CPL-4 CPL-5 *PLO-3* *PLO-3* *PLO-3* *PLO-4* *PLO-5*
Isi ***Content***	1. Ideologi Pancasila 2. Sejarah Pancasila 3. Pancasila sebagai dasar Negara Republik Indonesia 4. Pancasila sebagai ideologi negara 5. Pancasila sebagai sistem filsafat 6. Pancasila sebagai sistem etika 7. Pancasila sebagai dasar nilai pengembangan ilmu 1. *Pancasila ideology* 2. *History of Pancasila* 3. *Pancasila as the basis of the Republic of Indonesia* 4. *Pancasila as the state ideology* 5. *Pancasila as a philosophical system* 6. *Pancasila as an ethical system* 7. *Pancasila as the basic value of developing science*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Learning methods: lectures, discussions, assignments (review, case study) Exam requirements: Minimum 75% attendance to take the final exam Question Form: True-False, Multiple Choice, and Essay or Assignment ● Final Score Components: ● Final Exam 35% ● Middle Exam 25% ● Structured Tasks 20% ● Quiz 20%	

	<table><tr><th>Final Score</th><th>Letter</th><th>Number Quality</th><th>Final Score</th><th>Letter</th><th>Number Quality</th></tr><tr><td>≥ 80 – 100</td><td>A</td><td>4.00</td><td>≥ 58 – <64</td><td>C+</td><td>2.50</td></tr><tr><td>≥ 76 – <80</td><td>A--</td><td>3.75</td><td>≥ 54 – <58</td><td>C</td><td>2.00</td></tr><tr><td>≥ 72 – <76</td><td>B+</td><td>3.50</td><td>≥ 50 – <54</td><td>C-</td><td>1.75</td></tr><tr><td>≥ 68 – <72</td><td>B</td><td>3.00</td><td>≥ 46 –<50</td><td>D+</td><td>1.50</td></tr><tr><td>≥ 64 – <68</td><td>B-</td><td>2.75</td><td>≥ 42 – <46</td><td>D</td><td>1.00</td></tr><tr><td></td><td></td><td></td><td>0 - < 42</td><td>E</td><td>0.00</td></tr></table>
Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive
Daftar bacaan ***Reading list***	1. Amelia, N. P., Sabila, I., & Asbari, M. (2022). Pancasila as a Paradigm of Science and Technology. *Journal of Information Systems and Management (JISMA)*, *1*(2), 1-6. 2. Jannah, A. N., & Dewi, D. A. (2021). Implementasi Pancasila dalam Kehidupan Sosial Budaya di Masyarakat Abad-21. *Jurnal Pendidikan Tambusai*, *5*(1), 931-936. 3. Nurafifah, W., & Dewi, D. A. (2021). Implementasi nilai-nilai Pancasila dalam kehidupan bermasyarakat, berbangsa, dan bernegara. *De Cive: Jurnal Penelitian Pendidikan Pancasila Dan Kewarganegaraan*, *1*(4), 98-104. 4. Risdiany, H., & Dewi, D. A. (2021). Penguatan Karakter Bangsa Sebagai Implementasi Nilai-Nilai Pancasila. *Jurnal Pendidikan Indonesia*, *2*(04), 696-711. 5. Triyadi, M. Y., & Anggelina, W. (2022). Pancasila as a Development Paradigm. *Journal of Information Systems and Management (JISMA)*, *1*(6), 5-12.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Bahasa Inggris I *English I*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UV191102 *UV191102*
Kursus (jika ada) ***Course (if applicable)***	Bahasa Inggris *English*
Semester ***Semester***	I (Satu) 1 (*First*)
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Wulan Retno W., M.Pd.
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credits or 3.2 ETCS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*
Prasyarat wajib	-

<table>
<tr><td>Mandatory prerequisites</td><td colspan="2"></td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mampu berkomunikasi secara ilmiah terkait ide, permasalahan, dan solusi dengan efektif melalui lisan dan tulisan pada komunitas di lingkup lokal, nasional dan internasional

Able to communicate scientifically related ideas, problems and solutions effectively through oral and written to communities at local, national and international levels</td><td>CPL-3, CPL-5

PLO-3, PLO-5</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Tata bahasa Inggris dasar seperti; Subjek, objek, menjadi, kata kerja, kata benda, kata sifat, kata ganti, dan modals. Tenses bahasa inggris dasar seperti simple past tense, simple present tense, simple future tense, simple progressive tense dan simple perfect tense.

Basic English grammar such as; Subject, object, to be, verb, noun, adjective, pronoun, and modals. Basic English tenses such as: simple past tense, simple present tense, simple future tense, simple progressive tense and simple perfect tense.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td colspan="2">Learning methods: lectures, discussions, assignments (review, case study)
Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
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● Final Exam 35%
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<tr><td>Daftar bacaan
Reading list</td><td colspan="2">1. Börjars, K., & Burridge, K. (2019). Introducing english grammar. Routledge.
2. Gupta, S. M. (2019). Current English Grammar and Usage. PHI Learning Pvt. Ltd..
3. Murphy, R., & Hashemi, L. (2019). English Grammar in Use. Supplementary Exercises. Cambridge: Cambridge Univ. Press.
4. Wigati, et al. (2021) General English for Upper Intermediate. Surabaya: UPN Veteran Jatim Press.
Others:
https://www.thejakartapost.com/ https://www.ted.com/talks
https://www.readingrockets.org/ https://breakingnewsenglish.com/</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Indonesia *Indonesian Language*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UN191103 *UN191103*
Kursus (jika ada) ***Course (if applicable)***	Indonesia *Indonesian Language*
Semester ***Semester***	I (Satu) 1 (*First*)
Penanggung Jawab Modul ***Person Responsible for the Module***	Drs. Kusnarto, M.Si., M.Pd.
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credit or 3.2 ETCS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan perkuliahan *Students must attend 75% of lectures*
Prasyarat wajib	-

Mandatory prerequisites		
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menerapkan pemahaman Bahasa Indonesia, baik dalam bentuk komunikasi lisan maupun penulisan karya ilmiah sesuai dengan kaidah berbahasa yang baik dan benar. *Students are capable to apply their understanding of Indonesian, both in the form of oral communication and writing scientific papers in accordance with good and correct language rules.*	CPL-1, CPL-2 *PLO-1, PLO-2*
Isi ***Content***	Mata kuliah ini adalah mata kuliah umum yang bertujuan untuk membentuk keterampilan berbahasa Indonesia, baik secara lisan maupun tulis, dalam bidang ilmiah. Setelah mengikuti perkuliahan ini diharapkan mahasiswa mampu (1) menggunakan bahasa Indonesia untuk memperkaya pikiran, gagasan, dan sikap ilmiah ke dalam berbagai bentuk karya ilmiah yang berkualitas (memenuhi syarat objektivitas, koherensi, kohesi, efektivitas, efisiensi, dan komunikatif); (2) menyunting secara kritis berbagai karya ilmiah dan menyempurnakannya berdasarkan hasil suntingan; (3) memanfaatkan kemahiran dalam berbahasa Indonesia untuk mengembangkan diri, baik secara lisan maupun tulisan. *This course is a general course that aims to form Indonesian language skills, both orally and in writing, in the scientific field. After attending this lecture, students are expected to be able to (1) use Indonesian to enrich scientific thoughts, ideas, and attitudes into various forms of quality scientific works (meeting the requirements of objectivity, coherence, cohesion, effectiveness, efficiency, and communicative); (2) critically edit various scientific works and improve them based on the results of editing; (3) utilize skills in Indonesian to develop themselves, both orally and in writing. Broadly speaking, the study materials discussed in this lecture include: a) History, position, and function of Indonesian language, b) Language Variety, c) Language Skills, d). Use of PUEBI, e) Word Formation Errors, f). Types of Sentences, g). Effective sentences, h) Paragraphs, i). Structure of Scientific Work, j). Citation and Bibliography, k) Scientific Presentation.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Learning methods: lectures, discussions, assignments (review, case study) Exam requirements: Minimum 75% attendance to take the final exam Question Form: True-False, Multiple Choice, and Essay or Assignment ● Final Score Components: ● Final Exam 35% ● Middle Exam 25% ● Structured Tasks 20% ● Quiz 20%	

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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive
Daftar bacaan ***Reading list***	1. Badan Pengembangan dan Pembinaan Bahasa. Kementerian Pendidikan dan Kebudayaan. 2011. Undang-Undang Republik Indonesia Nomor 24 Tahun 2009 tentang Bendera, Bahasa, dan Lambang Negara, Serta Lagu Kebangsaan. 2. Badan Pengembangan dan Pembinaan Bahasa. Kementerian Pendidikan dan Kebudayaan. 2022. Kamus Besar Bahasa Indonesia. Kamus Besar Bahasa Indonesia | Badan Pengembangan dan Pembinaan Bahasa - Kemendikbud Ristek (kemdikbud.go.id) 3. Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan Republik Indonesia. 2016. Buku Ajar Mata Kuliah Wajib Umum Bahasa Indonesia. Bahasa_Indonesia.pdf (pajak.go.id) 4. Hani'ah, M. 2018. Panduan Terlengkap PUEBI (Pedoman Umum Ejaan Bahasa Indonesia). Laksana. 5. Suyatno, dkk. 2017. Bahasa Indonesia untuk Perguruan Tinggi: Membangun Karakter Mahasiswa melalui Bahasa. Bogor: In Media.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Pengantar Agribisnis *Introduction to Agribusiness*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	FP191101 *FP191101*
Kursus (jika ada) ***Course (if applicable)***	Pengantar Agribisnis *Introduction to Agribusiness*
Semester ***Semester***	I (Satu) 1 (*First*)
Penanggung Jawab Modul ***Person Responsible for the Module***	Prof. Dr. Ir. Syarif Imam Hidayat, M.M.
Pengajar ***Lecturer***	Prof. Dr. Ir. Syarif Imam Hidayat, M.M. Dr. Ir. Indra Tjahaja Amir, M.P Dr. Ir. Taufik Setyadi, M.P Ika Sari Tondang, S.P., M.Sc. Dita Atasa, S.P., M.P.
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credit or 3.2 ETCS*
Persyaratan sesuai ketentuanujian	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Requirements according to theexamination regulations		
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu bertanggung jawab menjelaskan tentang bisnis komoditas pertanian, tantangan bisnis pertanian, pengelolaan bisnis pertanian Mahasiswa mampu menjelaskan konsep ruang lingkup agribisnis, fungsi-fungsi manajemen bisnis, perencanaan strategis bisnis dan pola tren manajemen bisnis pertanian dengan benar Mahasiswa mampu menyusun konsep bisnis yang ada dalam pertanian Mahasiswa mampu menguraikan dan menjelaskan terkait studi kasus dalam agribisnis yang meliputi: bisnis pertanian yang sukses dan gagal; komparasi bisnis pertanian dan non pertanian serta kasus bisnis pertanian yang aktual *Students capable to responsibly explain about agricultural commodity businesses, agricultural business challenges, agricultural business management* *Students capable to explain the concepts of agribusiness scope, business management functions, business strategic planning and trend patterns of agricultural business management correctly agricultural business management correctly* *Students capable to organize existing business concepts in agriculture* *Students capable to describe and explain related case studies in agribusiness which include: successful and failed agricultural businesses; comparisons of agricultural and non-agricultural businesses and actual agricultural business cases*	CPL 2 CPL 3 CPL 4 CPL 11 *PLO 2* *PLO 3* *PLO 4* *PLO 11*
Isi ***Content***	Mata kuliah ini memberikan pengetahuan tentang pengantar agribisnis sehingga diharapkan mahasiswa dapat konsep-konsep dasar dalam agribisnis. Beberapa topik yang akan dibahas meliputi: bisnis komoditas pertanian, tantangan bisnis pertanian, pengelolaan bisnis pertanian, fungsi-fungsi manajemen bisnis pertanian, perencanaan strategis bisnis pertanian, pola tren manajemen bisnis pertanian, penyusunan konsep bisnis pertanian, bisnis pertanian yang sukses dan gagal, komparasi bisnis pertanian dan non pertanian, serta dan diakhiri dengan studi kasus. *This course provides knowledge of introductory agribusiness so that students are expected to have basic concepts in agribusiness. Some of the topics that will be discussed include: agricultural commodity business, agricultural business challenges, agricultural business management, functions of agricultural business management, strategic planning of agricultural business, patterns of agricultural business management trends, conceptualizing agricultural business, and developing agricultural*	

<table>
<tr><td></td><td>business concepts. functions of agricultural business management, strategic planning of agricultural business, trend patterns of agricultural business management, preparation of agricultural business concepts, successful and failed agricultural businesses, agricultural and non-agricultural business comparisons, as well as and ending with a case study.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Learning methods: lectures, discussions, assignments (review, case study)
Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
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Media employed</td><td>Hardwares : Projector and screensr, reference book, sound system
Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>1. Boland, M., & Çakır, M. (2018). Agribusiness economics and management. The Routledge Handbook of Agricultural Economics, 760-777.
2. Luhmann, H., & Theuvsen, L. (2016). Corporate social responsibility in agribusiness: Literature review and future research directions. Journal of Agricultural and Environmental Ethics, 29, 673-696.
3. Soetriono, S., Soejono, D., Hani, E. S., Suwandari, A., & Narmaditya, B. S. (2020). Challenges and opportunities for agribusiness development: Lesson from Indonesia. The Journal of Asian Finance, Economics and Business, 7(9), 791-800.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Ilmu Pertanian Modern *Modern Agricultural Science*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	FP191102 *FP191102*
Kursus (jika ada) ***Course (if applicable)***	Ilmu Pertanian Modern *Modern Agricultural Science*
Semester ***Semester***	I (Satu) 1 (*First*)
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Nora Augustien K, MP
Pengajar ***Lecturer***	Dr. Ir. Nora Augustien K, MP Ir. Hadi Suhardjono, M.TP Dr. Ir. Ramdan Hidayat, MS Nova Triani, SP, MP Dr. Ir. Purnomo Edi S, MP
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credits or 3.2 ETCS*
Persyaratan sesuai ketentuanujian	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Requirements according to theexamination regulations		
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menunjukkan kemampuan menguasai teori, konsep ilmu pertanian khususnya tanaman baik on farm maupun *off farm.* Mahasiswa mampu menunjukkan kemampuan menguasai budidaya tanaman, usaha tani, teknologi pertanian, pengembangan pasca panen dan strategi pemasaran Mahasiswa mampu mengkomunikasikan konsep ilmu pertanian kepada masyarakat secara tepat dan benar. *Students capable to demonstrate the ability to master the theory, and concepts of agricultural science, especially plants both on-farm and off-farm.* *Students capable to demonstrate the ability to master crop cultivation, farming business, agricultural technology, post-harvest development, and marketing strategies.* *Students are capable of communicating the concepts of agricultural science to the community appropriately and correctly.*	CPL 2 CPL 3 CPL 4 *PLO 2* *PLO 3* *PLO 4*
Isi ***Content***	Mata kuliah pengantar ilmu pertanian mengantarkan mahasiswa ke dunia pertanian dalam arti luas dengan membahas berbagai topik yang berkaitan dengan ilmu-ilmu pertanian yang diawali dengan: Konsep dasar ilmu pertanian, Sejarah Pertanian,Sistem budidaya pertanian, Ketahanan pangan, Teknologi Pertanian, Metabolisme Tanaman dan Pengaruh lingkungan Usaha tani dan Perusahaan usaha tani, Agribisnis dan Agroindustri, Pembangunan Pertanian di Indonesia dan Agribisnis di Era Global. *The introductory agricultural science course introduces students to the world of agriculture in a broad sense by discussing various topics related to agricultural sciences beginning with: Basic concepts of agricultural science, Agricultural History, Agricultural cultivation systems, Food security, Agricultural technology, Plant metabolism and environmental influences Farming and farming companies, Agribusiness and Agro-industry, Agricultural development in Indonesia and Agribusiness in the Global Era.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Learning methods: lectures, discussions, assignments (review, case study) Exam requirements: Minimum 75% attendance to take the final exam Question Form: True-False, Multiple Choice, and Essay or Assignment ● Final Score Components: ● Final Exam 35% ● Middle Exam 25% ● Structured Tasks 20% ● Quiz 20%	

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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive
Daftar bacaan ***Reading list***	1. Devlet, A. 2021. Modern agriculture and challenges. *Frontiers in Life Sciences and Related Technologies*, *2*(1), 21-29. 2. Jhariya, M. K., Banerjee, A., Meena, R. S., & Yadav, D. K. (Eds.). 2019. *Sustainable agriculture, forest and environmental management*. Springer. 3. Sarkar, S., Skalicky, M., Hossain, A., Brestic, M., Saha, S., Garai, S., & Brahmachari, K. 2020. Management of crop residues for improving input use efficiency and agricultural sustainability. *Sustainability*, *12*(23): 9808. 4. Pasupulla, A. P., Pallathadka, H., Nomani, M. Z. M., Salahuddin, G., & Rauf, M. 2021. A survey on challenges in organic agricultural practices for sustainable crop production. *Annals of the Romanian Society for Cell Biology*, 338-347.

COURSE MODULE
AGROTECHNOLOGY STUDY PROGRAM
FACULTY OF AGRICULTURE
UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR

Nama Modul ***Module name***	Biologi Pertanian *Agricultural Biology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	FP191103 *FP191103*
Kursus (jika ada) ***Course (if applicable)***	Biologi Pertanian *Agricultural Biology*
Semester ***Semester***	I (Satu) 1st (*First*)
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Dra. Endang Triwahyu P., M.Si
Pengajar ***Lecturer***	Dr. Dra. Endang Triwahyu Prasetyawati, M.Si. Dr. Ir. Makhziah, MP Dr. Ir. Nora Augustien Kusuma, MP Dr. Ir. Arika Purnawati, MP. Dr. Ir. Penta Suryaminarsih, MP. Dr. Ir. Pangesti Nugrahani, M.Si. Dr. Ir. Ida Retno Moeljani, MP. Drh. Wiludjeng Widajati, MP Noni Rahmadini, SP., MSc. Safira Rizka Lestari, SP., MP. Puji Lestari Tarigan, SP., MSc
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)

Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*	
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and theircorresponding PLOs***	Berkarakter bela negara yaitu cinta tanah air, kesadaran berbangsa dan bernegara, meyakini Pancasila sebagai ideologi negara, rela berkorban untuk bangsa dan negara, serta memiliki kemampuan awal bela negara Menunjukkan sikap bertanggungjawab atas pekerjaan di bidang keahliannya secara mandiri; Kemampuan menerapkan pengetahuan ilmu tanaman dan konsep dasar produksi tanaman, tanah dan konsep dasar sumber daya lahan, serta hama dan penyakit tanaman dan konsep perlindungan tanaman terhadap hama penyakit secara terpadu; Kemampuan menguasai prinsip-prinsip penerapan teknologi pertanian untuk menyelesaikan permasalahan di bidang pertanian *Commit to the ethical, moral, and character values of defending the country as a professional in agriculture* *Able to think critically and analytically, solve problems, be responsible for work independently, and make appropriate decisions based on information that can be accounted* *Able to apply the knowledge of plant Science, the basic concepts of plant production, land resources and soil science, and integrated concept of plant protection against of pests and diseases* *Able to apply the principles of agricultural technology to solve agricultural problems*	CPL-1 CPL-2 CPL-4 CPL-4 *PLO-1* *PLO-2* *PLO-4* *PLO-4*
Isi ***Content***	1. Sel Tanaman 2. Mikroorganisme 3. Struktur dan organ tanaman 4. Sistem Reproduksi tanaman 5. Nomenklatur dan Klasifikasi tanaman 6. Fotosintesis 7. Respirasi 8. Ujian Tengah semester 9. Arthropoda 10. Biota Tanah 11. Biosfer dan Ekosistem 12. Biodiversitas dan Populasi Dinamika	

	13. Polusi dan pengolahan limbah Pertanian 14. Materi Genetik Tanaman 15. Bioteknologi Pertanian 16. Ujian Akhir Semester 1. *Plant Cells* 2. *Microorganisms* 3. *Plant structure and organs* 4. *Plant reproductive system* 5. *Nomenclature and Classification of plants* 6. *Photosynthesis* 7. *Respiration* 8. *Midterm exam* 9. *Arthropods* 10. *Soil Biota* 11. *Biosphere and Ecosystems* 12. *Biodiversity and Population Dynamics* 13. *Pollution and processing of agricultural waste* 14. *Plant Genetic Material* 15. *Agricultural Biotechnology* 16. *Final Semester Exam*
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Learning methods: lectures, discussions, assignments (review, case study) Exam requirements: Minimum 75% attendance to take the final exam Question Form: True-False, Multiple Choice, and Essay or Assignment ● Final Score Components: ● Final Exam 35% ● Middle Exam 25% ● Structured Tasks 20% ● Quiz 20%

Final Score	Letter	Number Quality	Final Score	Letter	Number Quality
≥ 80 – 100	A	4.00	≥ 58 – <64	C+	2.50
≥ 76 – <80	A--	3.75	≥ 54 – <58	C	2.00
≥ 72 – <76	B+	3.50	≥ 50 – <54	C-	1.75
≥ 68 – <72	B	3.00	≥ 46 –<50	D+	1.50
≥ 64 – <68	B-	2.75	≥ 42 – <46	D	1.00
			0 - < 42	E	0.00

Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Daftar bacaan ***Reading list***	1. Mauseth, J. D. (2014). *Botany: an introduction to plant biology*. Jones & Bartlett Publishers. 2. Pollard, T. D., Earnshaw, W. C., Lippincott-Schwartz, J., & Johnson, G. (2022). *Cell biology E-book*. Elsevier Health Sciences. 3. Sharma, A., Kapoor, D., Gautam, S., Landi, M., Kandhol, N., Araniti, F., & Zheng, B. (2022). Heavy metal induced regulation of plant biology: Recent insights. *Physiologia Plantarum*, *174*(3), e13688. 4. Younas, T., Umer, M., Husnain Gondal, A., Aziz, H., Khan, M. S., Jabbar, A., & Ore Areche, F. (2022). A comprehensive review on impact of microorganisms on soil and plant. *Journal of Bioresource Management*, *9*(2), 12.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Ekonomi Pertanian *Agricultural Economics*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	FP191104 *FP191104*
Kursus (jika ada) ***Course (if applicable)***	Ekonomi Pertanian *Agricultural Economics*
Semester ***Semester***	I (Satu) 1 (*First*)
Penanggung Jawab Modul ***Person Responsible for the Module***	Ir. Sri Widayanti, M.P.
Pengajar ***Lecturer***	Ir. Sri Widayanti, MP Dr. Ir. Eko Nurhadi, MP Dr. Ir. Zainal Abidin, MS Dr. Noor Rizkiyah, SP, MP Dita Atasa., SP., MP
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credit or 3.2 ETCS*
Persyaratan sesuai ketentuanujian	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Requirements according to theexamination regulations		
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mampu bertanggung jawab dalam menyelesaikan penugasan tentang ruang lingkup ekonomi pertanian secara secara mandiri	CPL 2
	Mampu menjelaskan konsep teoritis secara umum tentang ekonomi pertanian, analisis biaya produksi, maksimalisasi profit, optimalisasi input dan output, teori pasar, permintaan dan penawaran dalam mendukung usaha dibidang agribisnis, baik dalam bentuk oral maupun tulisan dengan multimedia maupun alat peraga lain yang sesuai.	CPL 3
	Mampu menerapkan pemikiran logis, kritis, sistematis, dan inovatif dengan memanfaatkan teknologi informasi dalam menganalisis biaya produksi, perilaku konsumen, pilihan konsumen, permintaan dan penawaran, secara berintegritas dan diwujudkan dalam dokumen saintifik.	CPL 4
	Mampu mengidentifikasi dan menganalisis masalah, potensi, dan prospek serta merekomendasikan alternatif pengambilan keputusan dalam ekonomi pertanian dan agribisnis terutama bidang optimalisasi input dan output, maksimalisasi profit, kekuatan pasar dengan menggunakan metode kuantitatif.	CPL 11
	Mampu merencanakan, mengorganisasikan, melaksanakan, dan mengevaluasi bisnis pertanian skala usahatani dan atau skala perusahaan (enterprise) dengan menggunakan konsep pertanian berkelanjutan dan kearifan lokal dengan cara melakukan analisis kuantitatif untuk mengantisipasi tantangan pertanian dan ekonomi global .	CPL 11
	Mampu menganalisis potensi pasar pada berbagai kondisi pasar, menginisiasi, dan mengelola agribisnis beserta resikonya berbasis pada sistem pertanian berkelanjutan (sustainable agriculture), dan pertanian terpadu (integrated agriculture).	CPL 11
	Students capable to be responsible in completing assignments on the scope of agricultural economics independently.	*PLO 2*
	Students capable to explain general theoretical concepts about agricultural economics, production cost analysis, profit maximization, input and output optimization, market theory, demand and supply in supporting businesses in agribusiness, both in oral and written form, inputs and outputs, market theory, demand and supply in supporting businesses in the field of agribusiness, both in oral and written form with multimedia and other appropriate teaching aids, writing with multimedia and other appropriate props.	*PLO 3*

	Students capable to apply logical, critical, systematic, and innovative thinking by utilizing information technology in analyzing the cost of production costs, consumer behavior, consumer choice, demand and supply, with integrity and manifested in scientific documents.	*PLO 4*
	Students capable to identify and analyze problems, potentials, and prospects as well as recommend alternative decision-making in agricultural economics and agribusiness, especially in the field of agriculture and agribusiness in agricultural economics and agribusiness, especially in the fields of input and output optimization, profit maximization, market power using quantitative methods.	*PLO 11*
	Students capable to plan, organize, implement, and evaluate farm-scale and or enterprise-scale agricultural businesses using agricultural concepts scale (enterprise) by using the concept of sustainable agriculture and local wisdom by conducting quantitative analysis to anticipate global agricultural and economic challenges of agriculture and the global economy.	*PLO 11*
	Students capable to analyze market potential in various market conditions, initiate, and manage agribusiness and its risks based on sustainable agriculture, and integrated agriculture.	*PLO 11*
Isi ***Content***	Mata kuliah ini akan memberikan kemampuan pemahaman, penerapan, dan analisis kepada mahasiswa tentang ekonomi pertanian yang mencakup karakteristik pertanian, biaya produksi, teori pasar, teori permintaan dan penawaran. Mata kuliah ini merupakan pembelajaran aplikasi ekonomi pada persoalan pertanian, khususnya dalam rangka memahami isu-isu pertanian terkini. Beberapa topik yang dibahas meliputi: konsep ekonomi pertanian, teori ekonomi produksi, maksimalisasi profit, pemilihan input dan output yang optimal, teori consumer choices, teori penawaran dan permintaan, teori pasar, competitive firm, market power, kondisi perekonomian, pertanian dan sumberdaya alam secara global. *This course will provide students with the ability to understand, apply, and analyze agricultural economics which includes agricultural characteristics, production costs, market theory, demand and supply theory. This course is a study of the application of economics to agricultural problems, especially in order to understand current agricultural issues. Some of the topics discussed include: the concept of agricultural economics, economic theory of production, profit maximization, optimal selection of inputs and outputs, consumer choices theory, supply and demand theory, market theory, competitive firm, market power, economic conditions, agriculture and natural resources globally.*	
Persyaratan belajar dan ujian serta bentuk ujian	Learning methods: lectures, discussions, assignments (review, case study)	

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Media employed</td><td>Hardwares : Projector and screensr, reference book, sound system
Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive</td></tr>
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2. Fatmawati, A., Mulyanti, D. R., Hasmidar, H., Nasution, A. H., & Muala, B. (2023). Ekonomi Pertanian: Pengantar dan Konsep Dasar Ekonomi Pertanian di Indonesial. PT. Sonpedia Publishing Indonesia.
3. Wibowo, E. T. (2020). Pembangunan Ekonomi Pertanian Digital Dalam Mendukung Ketahanan Pangan (Studi di Kabupaten Sleman: Dinas Pertanian, Pangan, dan Perikanan, Daerah Istimewa Yogyakarta). Jurnal Ketahanan Nasional, 26(2), 204-228.
4. Yogi, I., & Ratnaningtyas, I. S. (2020). Pengantar Ekonomi Pertanian. Yogi & Sudrajati Ratnaningtyas.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Agroklimatologi *Agroclimatology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191109 *PG191109*
Kursus (jika ada) ***Course (if applicable)***	Agroklimatologi *Agroclimatology*
Semester ***Semester***	I (Satu) 1st (*First*)
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Moch. Arifin, MT
Pengajar ***Lecturer***	Dr. Ir. Moch. Arifin, MT Ir. Widiwurjani, MP Fadila Suryandika, STP, M.Sc Fitri Wijayanti, SP, MP
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Beban kerja ***Work load***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Angka kredit	3 SKS

Credit point	*3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuan ujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan konsep dasar teori iklim, menunjukkan hubungannya dengan pertanian, dan menunjukkan contoh penerapannya dalam bidang pertanian. Mahasiswa mampu menjelaskan unsur-unsur iklim (atmosfer, penyinaran matahari, suhu udara, penguapan, angin, awan, hujan, dan tekanan udara) dan hubungan unsur-unsur iklim dengan pertanian serta mempraktekkan pengamatan unsur-unsur iklim. Mahasiswa mampu menentukan klasifikasi iklim suatu daerah dan menghubungkannya dengan kebutuhan pertumbuhan tanaman serta merancang pola tanam berdasarkan klasifikasi iklim dan juga kebutuhan pertumbuhan tanaman. Mahasiswa mampu menyimpulkan tentang fenomena perubahan iklim dan merumuskan penyebab terjadinya serta menunjukkan dampaknya dalam bidang pertanian. *Students are capable explaining the basic concepts of climate theory showing the relationship with agriculture and show examples of application in agriculture.* *Students are capable to explaining the elements of climate (atmosphere, solar radiation, air temperature, evaporation, wind, clouds, rain, and air pressure) and the relationship between climate elements and agriculture and also practice the observation of climate elements.* *Students are capable determining the climate classification of an area and relating it to plant growth requirements and designing cropping patterns based on climate classification and plant growth requirements.* *Students are capable to concluding about the phenomenon of climate change formulating the causes of the occurrence and show its impact in the field of agriculture.*	CPL 5 CPL 5 CPL 3, CPL 8 CPL 5 *PLO 5* *PLO 5* *PLO 3, PLO 8* *PLO 5*
Isi ***Content***	Mata kuliah yang mempelajari tentang unsur-unsur iklim, hubungan unsur-unsur iklim, perubahan iklim, zona iklim dan klasifikasinya serta hubungannya dengan pertanian. Memahami alat-alat yang tersedia di stasiun klimatologi dan mampu mengukur unsur-unsur cuaca (lama penyinaran, penyinaran matahari, kelembaban relatif, curah hujan, penguapan dan kecepatan angin). Konsep dasar klasifikasi dan pembagian iklim serta penerapan klasifikasi iklim di bidang pertanian juga dipelajari pada mata kuliah ini. Selain itu, mata kuliah ini mempelajari fenomena perubahan iklim, penyebab perubahan iklim, dampak perubahan iklim di bidang pertanian, dan cara merumuskan strategi mitigasi dan adaptasi perubahan iklim.	

<table>
<tr><td></td><td>A course that studies the elements of climate, the relationship between climate elements, climate change, climate zones and classifications and their relationship to agriculture. Understand the tools available at climatology stations and be able to measure weather elements (length of irradiation, solar radiation, relative humidity, rainfall, evaporation and wind speed). The basic concepts of climate classification and division and the application of climate classification in agriculture are also studied in this course. In addition, the course studies the phenomenon of climate change, the causes of climate change, the impact of climate change in agriculture, and how to formulate climate change mitigation and adaptation strategies.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Learning methods: lectures, discussions, assignments (review, case study)
Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
● Middle Exam 25%
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Reading list</td><td>1. Balasubramanian, T. N., Jagannathan, R., & Geethalakshmi, V. (2022). Agro-climatology: Advances and Challenges.
2. Fraisse, C. (2018). AgroClimate: Developing solutions for climate challenges. Resource Magazine, 25(4), 8-10.
3. Hatfield, J. L., Sivakumar, M. V., & Prueger, J. H. (2019). Agroclimatology. John Wiley & Sons, Incorporated.
4. McDonald, M. R., & Warland, J. (2020). Vegetables and climate change. Agroclimatology: Linking Agriculture to Climate, 60, 327-341.</td></tr>
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SEMESTER 2

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Kewarganegaraan *Civic Education*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UV21008 *UV21008*
Kursus (jika ada) ***Course (if applicable)***	Kewarganegaraan *Civic Education*
Semester ***Semester***	II (Dua) *2nd (Second)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Prof. Dr. Ir. H. Syarif Imam Hidayat, M.M.
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Beban kerja ***Work load***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Angka kredit ***Credit point***	2 SKS *2 credit or 3.2 ETCS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa memahami hakikat Pendidikan Kewarganegaraan dalam mengembangkan seluruh kemampuan sarjana atau profesional serta urgensinya bagi masa depan bangsa	CPL-2
	Mahasiswa menguasai substansi pendidikan kewarganegaraan untuk memiliki kepribadian Indonesia, dan membangun rasa kebangsaan dan cinta tanah air, sehingga menjadi warga negara yang baik dan terpelajar (smart and good citizen) dalam kehidupan bermasyarakat, berbangsa dan bernegara yang demokratis.	CPL-2
	Mahasiswa memahami korelasi pendidikan kewarganegaraan dengan nilai-nilai kehidupan sehingga menjadi warga negara Indonesia yang berkepribadian, berdaya saing, dan disiplin. Indonesia memiliki daya saing, disiplin, dan partisipasi aktif dalam membangun kehidupan damai berdasarkan sistem nilai Pancasila.	CPL-6
	Mahasiswa menguasai penerapan konsep kewarganegaraan, untuk mewujudkan warga negara yang baik, mampu menunjang bangsa dan negara, warga negara yang demokratis, yaitu warga negara yang cerdas, beradab, dan bertanggung jawab terhadap kelangsungan negara Indonesia dalam mengamalkan ilmu pengetahuan dan teknologi. kelangsungan hidup negara Indonesia dalam mengamalkan ilmu pengetahuan, teknologi, dan keterampilan seninya.	CPL-6
	Mahasiswa memahami kontribusi kewarganegaraan dalam membentuk sikap dan nilai-nilai: menghargai keberagaman, mampu bekerja sama, memiliki sifat amanah, kepekaan sosial, dan rasa cinta yang tinggi terhadap masyarakat, dan bangsa.	CPL-5
	Student understand the nature of Citizenship Education in developing the full capabilities of undergraduates or professionals and its urgency for the future of the nation	*PLO-2*
	Student mastering the substance of civic education to have an Indonesian personality, and build a sense of nationality and love for the country, so as to become a good and educated citizen (smart and good citizen) in community life, democratic nation and state.	*PLO-2*
	Student understand the correlation of civic education with the values of life so as to become a citizen with Indonesian personality, competitiveness, and discipline. *Indonesia has competitiveness, discipline, and active participation in building a peaceful life based on the Pancasila value system.*	*PLO-6*
	Student mastering the application of the concept of citizenship, to make good citizens who capable to support the nation and state, democratic citizens, namely citizens who are intelligent, civilized, and responsible for the survival of the Indonesian state in practicing	*PLO-5*

<table>
<tr><td></td><td>science and technology. the survival of the Indonesian state in practicing its knowledge, technology, and art skills.
Student understand the contribution of citizenship in shaping attitudes and values: respecting diversity, being able to cooperate, having trustworthiness, social sensitivity, and high love for society, and nation.</td><td>PLO-6</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Membahas bahasa Indonesia, menjadi warga negara yang berkepribadian Indonesia, membangun rasa kebangsaan dan cinta tanah air Indonesia, sehingga mampu menjadi warga negara yang cerdas dan baik dalam kehidupan bermasyarakat, berbangsa, dan bernegara yang demokratis.

Discussing Indonesian, becoming a citizen with an Indonesian personality, building a sense of nationality and love for the Indonesian homeland, thus will be able to become a smart and good citizen in the life of a democratic society, nation, and state.</td></tr>
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Study and examination requirements and forms of examination</td><td colspan="2">Learning methods: lectures, discussions, assignments (review, case study)
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2. Kemenristekdikti. 2016. Modul Pendidikan Kewarganegaraan Untuk Perguruan Tinggi. Jakarta: Dirjen Belmawa Kemenristekdikti.
3. Kurniati, P., Putra, H. M., Komara, L. S., Wibianika, H., & Setiansyah, R. 2021. Budaya Kewarganegaraan, Praktek Kewarganegaraan dan Pendidikan Untuk Kewarganegaraan Demokratis. Jurnal Ilmiah P2M STKIP Siliwangi, 8(2), 107-115.</td></tr>
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	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Bahasa Inggris I *English I*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UV191105 *UV191105*
Kursus (jika ada) ***Course (if applicable)***	Bahasa Inggris *English*
Semester ***Semester***	II (Dua) *2nd (Second)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Wulan Retno W., M.Pd.
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credits or 3.2 ETCS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

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Mandatory prerequisites</td><td colspan="2">-</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mampu berkomunikasi secara ilmiah terkait ide, permasalahan, dan solusi dengan efektif melalui lisan dan tulisan pada komunitas di lingkup lokal, nasional dan internasional

Able to communicate scientifically related ideas, problems and solutions effectively through oral and written to communities at local, national and international levels</td><td>CPL-3

PLO-3</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Mata kuliah ini didesain sebagai untuk mempelajari dan mengasah ketrampilan dasar Bahasa Inggris yang harus dimilki oleh mahasiswa S1. Setelah mengikuti mata kuliah ini, mahasiswa diharapkan dapat mempratekkan ketrampilan dasar bahasa Inggris untuk keperluan akademis dan non akademis, sehingga dapat berkomunikasi dan menunjang karir di ranah internasional.

This course is designed to learn and hone the basic English skills that undergraduate students must have. After taking this course, students are expected to be able to practice basic English skills for academic and non-academic purposes, so they can communicate and support careers in the international realm.</td></tr>
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	3. Murphy, R., & Hashemi, L. (2019). *English Grammar in Use. Supplementary Exercises*. Cambridge: Cambridge Univ. Press. 4. Wigati, et al. (2021) General English for Upper Intermediate. Surabaya: UPN Veteran Jatim Press. Others: https://www.thejakartapost.com/ https://www.ted.com/talks https://www.readingrockets.org/ https://breakingnewsenglish.com/

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Ekologi Pertanian *Agricultural Ecology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191101 *PG191101*
Kursus (jika ada) ***Course (if applicable)***	Agricultural Ecology
Semester ***Semester***	II (Dua) *2nd (Second)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Ir. Widiwurjani, MP
Pengajar ***Lecturer***	1. Ir. Widiwurjani, M.P. 2. Dr. F Deru Dewati, SP. MP 3. Dr. Ir. Endang Triwahyu, MP 4. Dr. Moch. Arifin, MT 5. Fadila Suryandika, STP, M.Sc.
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credit or 3.2 ETCS*
Persyaratan sesuai ketentuanujian	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Requirements according to theexamination regulations		
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu memahami dan menganalisis secara mandiri ekologi di bidang pertanian baik ekologi faktor abiotik (radiasi matahari, suhu udara, tanah dan air) maupun ekologi faktor biotik (gulma, hama, penyakit dan mikroorganisme) yang berkaitan dengan pertumbuhan dan produksi tanaman. Mahasiswa mampu menjelaskan dan menerapkan kaidah kaidah ekologi yaitu adanya hubungan timbal balik antara faktor biotik dan abiotik dalam pertanian untuk memecahkan permasalahan dan merencanakan kegiatan di bidang pertanian. Mahasiswa mampu menguasai prinsip dan isu terkini mengenai ekologi pertanian serta dampaknya terhadap pertumbuhan dan produksi tanaman. Students are capable to independently understand and analyze ecology in agriculture both the ecology of abiotic factors (solar radiation, air temperature, soil and water) and ecology of biotic factors (weeds, pests, diseases and microorganisms) related to plant growth and production. Students are capable to explain and apply the rules of ecological rules, namely the existence of a reciprocal relationship between biotic and abiotic factors in agriculture to solve problems and plan activities in agriculture. Students are capable to master the principles and current issues on agricultural ecology and its impact on plant growth and production.	CPL 2, CPL 4 CPL 5 CPL 8 *PLO 2, PLO 4* *PLO 5* *PLO 8*
Isi ***Content***	Mata kuliah yang mempelajari lingkungan hidup, ekosistem, hubungan timbal balik antara faktor biotik dan abiotik, pengaruh lingkungan biotik dan abiotik terhadap pertumbuhan dan produksi tanaman, mengidentifikasi dan merumuskan permasalahan ekologi di bidang pertanian, merencanakan solusi dan modifikasi lingkungan untuk mengatasi permasalahan tersebut. *A course that studies the environment, ecosystems, the mutual relationship between biotic and abiotic factors, the influence of the biotic and abiotic environment on plant growth and production, identifies and formulates ecological problems in agriculture, plans solutions, and environmental modifications to overcome these problems.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Learning methods: lectures, discussions, assignments (review, case study) Exam requirements: Minimum 75% attendance to take the final exam Question Form: True-False, Multiple Choice, and Essay or Assignment ● Final Score Components: ● Final Exam 35% ● Middle Exam 25% ● Structured Tasks 20% ● Quiz 20%	

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Daftar bacaan ***Reading list***	1. Djohar Maknun, DM (2017) Ecology: population, community, ecosistem, Realizing Green, Natural, Islamic, and Scientific Campus. Nurjati Press, Cirebon, pp. 1-244. ISBN 978-602-9074-59-8 2. Kemas AH, A. Napoleon, Nuni Ghofar. 2021. Soil Biology Ecology and Soil Macrology. Radja Grafindo Persada. 3. Marheni Lukitasari. 2020. Plant Ecology. PGRI University Madiun. 4. Nurul Firdausi. Ecosystems and Ecology. Deepublish Jogjakarta. 5. Rosmawati. 2021. Aquatic Ecology. Proceedings of UPPATTI. 6. Zoer Arini. 2020. Principles of Ecology Ecosystems, Environment and Preservation. ITS. Surabaya.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Dasar Budidaya Tanaman *Introduction to Agronomy*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191106 *PG191106*
Kursus (jika ada) ***Course (if applicable)***	Dasar Budidaya Tanaman *Introduction to Agronomy*
Semester ***Semester***	II (Dua) *2nd (Second)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Ir. Djarwatiningsih PS, MP
Pengajar ***Lecturer***	1. Ir. Djarwatiningsih PS, MP 2. Ir. Widiwurjani, MP 3. Ir. Agus Sulistyono, MP 4. Fadila Suryandika, STP, M.Sc
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ECTS*

Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu melaksanakan budidaya pertanian dengan baik dan benar (minimal mencakup lima usaha peternakan), Mahasiswa mampu menyiapkan bahan tanam baik secara generatif (biji) maupun secara vegetatif (cangkok, stek dan okulasi), Mahasiswa mampu menerapkan prinsip-prinsip teknologi dan prinsip pemeliharaan untuk meningkatkan produksi, mampu mendeskripsikan dan menggambarkan hubungan antara masa pertumbuhan tanaman dengan masa tanam, masa panen. *Students capable to carry out agricultural cultivation properly and correctly (at least including five farming enterprises),* *Students capable to prepare planting materials both generatively (seeds) and vegetatively (grafts, cuttings and grafting),* *Students capable to implement the principles of technology and maintenance principles to increase production, able to describe and describe the relationship between plant growth periods with planting periods, harvest periods.*	PLO 4 PLO 5 PLO 8 *CLO 4* *CLO 5* *CLO 8*
Isi ***Content***	Mata kuliah ini dimaksudkan untuk membekali mahasiswa dengan kemampuan menguasai konsep dan teori teknologi di bidang pertanian dan budidaya tanaman berbasis komoditas secara mandiri maupun bekerjasama serta mempunyai kepedulian terhadap masyarakat dan lingkungan. Mata kuliah ini terdiri dari 2 SKS kuliah dan 1 SKS praktikum. Meliputi materi tentang pengertian budidaya dengan aspek agronomi, faktor lingkungan tanaman, iklim, tanah dan tanaman, struktur dan fungsi tanaman, pertumbuhan dan perkembangan tanaman, pemuliaan tanaman dan teknik budidaya tanaman untuk mencapai produksi yang maksimal. *This course is intended to provide students with the ability to master the concepts and theories of technology in agriculture and commodity-based plant cultivation independently or in collaboration and have concern for society and the environment. This course consists of 2 credits of lecture and 1 credit of practicum. Includes material on the understanding of cultivation with agronomic aspects, plant environmental factors, climate, soil and plants, plant structure and function, plant growth and development, plant breeding and plant cultivation techniques to achieve maximum production.*	

<table>
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<td>Persyaratan belajar dan ujian serta bentuk ujian
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<td>Learning methods: lectures, discussions, assignments (review, case study)
Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
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<td>Daftar bacaan
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<td>1. de Borja Reis, A. F., Moro Rosso, L., Purcell, L. C., Naeve, S., Casteel, S. N., Kovács, P., ... & Ciampitti, I. A. (2021). Environmental factors associated with nitrogen fixation prediction in soybean. Frontiers in Plant Science, 12, 675410.
2. Kamaludin, M., Narmaditya, B. S., Wibowo, A., & Febrianto, I. (2021). Agricultural land resource allocation to develop food crop commodities: lesson from Indonesia. Heliyon, 7(7).
3. Rehman, A., Jingdong, L., Khatoon, R., Hussain, I., & Iqbal, M. S. (2016). Modern agricultural technology adoption its importance, role and usage for the improvement of agriculture. Life Science Journal, 14(2), 70-74.</td>
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	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Dasar Ilmu Tanah *Introduction of Soil Science*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	FP-191107 *FP-191107*
Kursus (jika ada) ***Course (if applicable)***	Dasar Ilmu Tanah Introduction of Soils Sciences
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Bakti Wisnu W., MP.
Pengajar ***Lecturer***	Dr. Ir. Bakti Wisnu W., MP. Dr. Ir. Rosyyida Priyadarsini, MP. Dr. Ir. Wanti Mindari, MP. Ir. Siswanto, MT. Fitri Wijayanti, SP., MP. Haidar Fari Aditya, SP. MP.
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*

Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa berkomitmen pada nilai-nilai etika, moral, dan karakter bela negara sebagai profesional di bidang pertanian Mahasiswa mampu menerapkan ilmu ilmu tanaman, konsep dasar produksi tanaman, ilmu sumber daya lahan dan tanah, serta konsep terpadu perlindungan tanaman terhadap hama dan penyakit. Mahasiswa mampu menerapkan prinsip-prinsip teknologi pertanian untuk menyelesaikan permasalahan pertanian *Student commit to the ethical, moral, and character values of defending the country as a professional in agriculture* *Student capable to apply the knowledge of plant Science, the basic concepts of plant production, land resources and soil science, and integrated concept of plant protection against of pests and diseases* *Student capable apply the principles of agricultural technology to solve agricultural problem*	CPL-1 CPL-4 CPL-5 *PLO 1* *PLO 4* *PLO 5*
Isi ***Content***	Mengkaji makna dan peranan tanah dalam kehidupan manusia dan ilmu-ilmu lainnya. Pembentukan dan perkembangan tanah. Komponen tanah. Batuan dan mineral. Sifat fisik, kimia, organisme dan bahan organik tanah. Dasar-dasar kesuburan dan pemupukan tanah. Dasar-dasar konservasi tanah dan air. Penggunaan lahan dan klasifikasi lahan secara umum. Pembentukan dan komponen tanah; Profil tanah; sifat fisik, kimia dan biologi tanah; siklus unsur hara tanah; pemupukan dan pemupukan; permasalahan lahan dan lingkungan hidup. *Examining the meaning and role of land in human life and other sciences. Soil formation and development. Soil components. Rocks and minerals. Physical, chemical properties, organisms and organic matter of soil. Basics of soil fertility and fertilization. Basics of soil and water conservation. Land use and general land classification.* *Soil formation and components; Soil profile; physical, chemical and biological properties of soil; soil nutrient cycles; fertilizing and fertilizing; land and environmental problems.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Learning methods: lectures, discussions, assignments (review, case study) Exam requirements: Minimum 75% attendance to take the final exam Question Form: True-False, Multiple Choice, and Essay or Assignment ● Final Score Components: ● Final Exam 35%	

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Middle Exam 25%
Structured Tasks 20%
Quiz 20%

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Gusmara, H., Nusantara, A. D., Hermawan, B., Barchia, M. F., Hendarto, K. S., Hasanudin, S., & Muktamar, Z. (2016). Bahan Ajar Dasar-dasar Ilmu Tanah. Universitas Bengkulu Fakultas Pertanian.
Hanafiah, K. A. (2019). Dasar dasar ilmu tanah. Raja Grafindo Persada.
Notohadiprawiro, T., Soekodarmodjo, S., & Sukana, E. (2006). Pengelolaan kesuburan tanah dan peningkatan efisiensi pemupukan. Ilmu Tanah, 1-19.
Utomo, I. M. (2016). Ilmu Tanah Dasar-Dasar dan Pengelolaan. Kencana.
Salam, A. K. (2020). Ilmu Tanah. UNILA.

</td></tr>
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	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Dasar Perlindungan Tanaman *Basic Plant Protection*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191108 *PG191108*
Kursus (jika ada) ***Course (if applicable)***	Dasar Perlindungan Tanaman *Introduction of Plant Protection*
Semester ***Semester***	I (satu) *1st (First)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Penta Suryaminarsih, MP.
Pengajar ***Lecturer***	Dr. Ir. Penta Suryaminarsih, MP. Dr. Ir. Tri Mujoko, MP. Dr. Ir. Wiwin Windriyati, MP. Dr. Ir. Arika Purnawati, MP. Dr. Dra.Endang TP. M.Si Noni Rahmadini, SP., MP, Prof. Moch. Sodiq. Drh. Wilujeng W., MP. Dita Megasari, SP., M.Si
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week*

	Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*	
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu mendiskripsikan Kerugian dan kerusakan tanaman, Konsep terjadinya Hama, Penyakit biotik abiotik, Konsep dasar Pemberantasan, Pengendalian dan perlindungan Tanaman thd OPT ramah lingkungan Mahasiswa mampu menjelaskan dan menentukan jenis penyakit abiotik, penyakit biotik, hama dan Gulma ,pada pertanian berdasarkan gejala dan tanda serangan OPT dari hasil pengamatan dan diskusi kolaboratif dengan pembimbing, sejawat Mahasiswa mampu menentukan strategi pengendalian terhadap hama dan penyakit berdasarkan undang-undang Mahasiswa mampu merencanakan dan melaksanakan pengendalian terhadap hama dan penyakit secara budidaya, hayati, Fisik dan Kimia berdasarkan prinsip ramah lingkungan dan berkelanjutan Mahasiswa mampu melakukan perlindungan tanaman dan menyelesaikan permasalahan hama penyakit dengan pengendalian hama penyakit secara terpadu ramah lingkungan berkelanjutan *Student capable to describe loss and damage to plants, the concept of pests, biotic abiotic diseases, basic concepts of eradication, control and protection of plants against environmentally friendly pests* *Student capable to explain and determine types of abiotic diseases, biotic diseases, pests and weeds in agriculture based on symptoms and signs of pest attacks from observations and collaborative discussions with supervisors, colleagues* *Students capable to determine pest and disease control strategies based on law* *Students capable to plan and implement control of pests and diseases in a cultural, biological, physical and chemical manner based on environmentally friendly and sustainable principles*	CPL-4 CPL-4 CPL-5 CPL-5 CPL-10 *PLO-4* *PLO-4* *PLO-5* *PLO-5* *PLO-10*

<table>
<tr><td></td><td>Students capable to protect plants and solve pest and disease problems by controlling pests and diseases in an integrated, environmentally friendly, sustainable manner</td></tr>
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Content</td><td>Tujuan mata kuliah ini adalah untuk memberikan bekal kepada mahasiswa untuk memahami konsep dasar perlindungan tanaman yang meliputi gambaran proses munculnya permasalahan hama dan penyakit tanaman, bionomy hama dan faktor lingkungan yang mempengaruhi perkembangan hama. Siswa juga diharapkan mampu memahaminya.

The purpose of this course is to provide students with the provision to understand the basic concepts of plant protection which includes a description of the process of emergence of pest and plant disease problems, pest bionomy and environmental factors that affect pest development. Students are also expected to be able to understand</td></tr>
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Study and examination requirements and forms of examination</td><td>Learning methods: lectures, discussions, assignments (review, case study)
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2. Suryaminarsih, P, Y. Wuryandari, W, Windriyati, N. Rahmadini .2021. Buku Ajar Dasar Perlindungan Tanaman
3. Wahyudin, D., Indarwati, I., Arsi, A., Astuti, T., Budiarti, L., Ramdan, E. P., & Malik, A. F. (2021). Dasar-Dasar Perlindungan Tanaman. Yayasan Kita Menulis.
4. Suryaminarsih, P. Y. Wuryandari, T. Mujoko, W. Windriyati., A. Purnawati, .E. Triwahyu, N. Rahmadini, Wilujeng ,D. Sari, 2020. Penuntun Praktikum.
5. Suryaminarsih, P., Harijani, W. S., Syafriani, E., Rahmadhini, N., & Hidayat, R. (2019). Aplikasi Streptomyces sp. Sebagai agen hayati pengendali lalat buah (Bactrocera sp.) dan plant growth promoting bacteria (PGPB) pada tanaman tomat dan cabai. AGRIUM: Jurnal Ilmu Pertanian, 22(1), 62-69.</td></tr>
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	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Pertanian Perkotaan *Urban Farming*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191102 *PG191102*
Kursus (jika ada) ***Course (if applicable)***	Pertanian Perkotaan *Urban Farming*
Semester ***Semester***	II (Dua) *2nd (Second)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Ramdan Hidayat, MS.
Pengajar ***Lecturer***	1. Dr.Ir. Ramdan Hidayat, MS. 2. Ir. Hadi Suhardjono, MTP. 3. Dr. Ir. Pangesti Nugrahani, MSi 4. Ir. Kemal Wijaya, MTP. 5. Dr. Ir. Purnomo Edi Sasongko,. MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credit or 3.2 ETCS*
Persyaratan sesuai ketentuanujian	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Requirements according to theexamination regulations		
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menunjukkan sikap bertanggung jawab atas pekerjaan dibidang keahliannya secara mandiri. Mahasiswa memahami dan menjelaskan tentang pertanian perkotaan (dengan beberapa metode budidaya). Mahasiswa mampu bekerjasama untuk merencakan, memproduksi dan mengelola, serta memasarkan hasil panen (Tanaman, ternak dan ikan yang dibudidayakan dan dipasarkan di wilayah perkotaan). *Students are able to demonstrate a responsible attitude towards work in their field of expertise independently.* *Students understand and explain urban agriculture (with several cultivation methods).* *Students are able to work together to plan, produce and manage, and market harvest products (crops, livestock and fish that are cultivated and marketed in urban areas).*	CPL-2 CPL-4 CPL-5 *PLO-2* *PLO-4* *PLO-5*
Isi ***Content***	Mata Kuliah ini mempelajari tentang deskripsi, manfaat, sejarah dan perspektif pertanian perkotaan (Tahun 2050, > 50 % penduduk dunia berada di kota) dengan beberapa keterbatasan (lahan, air, suhu, kelembaban) dan menjadi solusi atas permasalahan limbah (sampah) di kota yang 70% adalah sampah organik melalui R-3 (Reduce, Re-Use dan Re-Cycle). Juga memanfaatkan potensi kota untuk usaha pertanian dengan menerapkan teknik budidaya kekinian yang tepat guna, seperti: Hidrophonik, Aquaphonik, Vertikultur, plant factory, budidaya tanaman dalam ruangan dan Pertamanan, Roof Top Agriculture, Tabulampot, Budidaya Jamur, Budidaya ikan, dll. MK ini juga akan membahas tentang kota cerdas (*Smart City*) dampak dari Revolusi Industri 4.0 dan masuknya masyarakat perkotaan kedalam “Society 5.0”, dimana mengandalkan budidaya presisi dengan memanfaatkan IOT, *Artificial Intelegence* dan *claudy data base* (*Online*). Juga dipelajari tentang Teknik Pemeliharaan Tanaman (pengairan, pemangkasan, pemupukan, pengendalian OPT) yang dibudidayakan secara kekinian di wilayah perkotaan, Strategi pemenuhan standard dan pengelolaan Ruang Terbuka Hijau (RTH), serta upaya mengatasi polusi udara perkotaan. *This course studies the description, benefits, history and perspective of urban agriculture (in 2050, > 50% of the world's population will be in cities) with several limitations (land, water, temperature, humidity) and is a solution to the problem of waste (garbage) in cities 70% of which is organic waste through R-3 (Reduce, Re-Use and Re-Cycle). Also utilizing the city's potential for agricultural businesses by applying contemporary and effective cultivation techniques, such as: Hydrophonics, Aquaphonics, Verticulture, plant factories, indoor plant cultivation and landscaping, Roof Top Agriculture, Tabulampot, Mushroom Cultivation, Fish Cultivation, etc. This MK will also discuss smart cities (Smart City),*	

<table>
<tr><td></td><td>the impact of the Industrial Revolution 4.0 and the entry of urban communities into "Society 5.0", which relies on precision cultivation by utilizing IOT, Artificial Intelligence and claudy data base (On-line). Also studied are plant maintenance techniques (watering, pruning, fertilizing, pest control) currently cultivated in urban areas, strategies for meeting standards and managing green open space (RTH), as well as efforts to overcome urban air pollution.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Learning methods: lectures, discussions, assignments (review, case study)
Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
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Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>
1. Abdillah, A., Widianingsih, I., Buchari, R. A., & Nurasa, H. (2023). Implications of urban farming on urban resilience in Indonesia: Systematic literature review and research identification. Cogent Food & Agriculture, 9(1), 2216484.
2. Fauzi, A. R., A. N. Achniarsyah dan H. Agustin. 2016. Pertanian Perkotaan: Urgensi, Peranan dan Praktik Terbaik. Jurnal Agroteknologi X(01):49-62
3. Dinas KPKP DKI. 2017. Prosiding Workshop Penyusunan Grand Desain Pertanian Kota Provinsi DKI Jakarta. 197 hal.
4. Widyawati, N. 2014. Urban Farming; Gaya Bertani Spesifik Kota. Lily Publisher. Yogyakarta.
5. Abidin, Zainal, Ir. 2016. Urban Farming Bertani Kreatif; Sayur, Hias, dan Buah. Agriflo.
6. Liferdi, L dan C. Saparinto, 2017. Vertikultur Tanaman Sayur; Bertani Kreatif secara Bertingkat di Lahan Sempit. Penebar Swadaya, Jakarta
</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Genetika Pertanian *Agricultural Genetics*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191103 *PG191103*
Kursus (jika ada) ***Course (if applicable)***	Genetika Pertanian *Agricultural Genetics*
Semester ***Semester***	II (Dua) *2nd (Second)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Makhziah, MP.
Pengajar ***Lecturer***	Dr.Ir. Makhziah, MP Prof. Dr.Ir. Juli Santoso, MP. Dr.Ir. Sukendah, MSc. Dr.Ir. Ida Retno Moeljani, MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agroteknologi Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agrotechnology* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*

Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa menunjukkan sikap bertanggungjawab atas tugas dan kewajibannya secara mandiri, mempunyai norma dan etika akademik. Mahasiswa mampu menjelaskan prinsip-prinsip pewarisan sifat pada makhluk hidup, penyusun materi genetik dan ekspresi gen, mampu menghitung dan memperkirakan proporsi dan frekuensi gen/alel. Mahasiswa mampu menguasai prinsip-prinsip penerapan Genetika Tumbuhan untuk kemajuan teknologi pertanian dalam rangka menyelesaikan permasalahan penyediaan benih unggul. *Students demonstrate a responsible attitude towards their duties and obligations independently, have academic norms and ethics.* *Students are able to explain the principles of inheritance of traits in living creatures, the composition of genetic material and gene expression, and are able to calculate and estimate the proportion and frequency of genes/alleles.* *Students are able to master the principles of applying Plant Genetics to advance agricultural technology in order to solve the problem of providing superior seeds.*	CPL-2 CPL-4 CPL-5 *PLO-2* *PLO-4* *PLO-5*
Isi ***Content***	Konsep dan Sejarah Genetika, Mekanisme sel dan siklus hidup tanaman, Materi Genetik (DNA dan RNA), Hukum Pewarisan Sifat I (Hukum Mendel), Hukum Pewarisan Sifat II (Interaksi gen), Pindah silang dan rekombinasi gen, Pindah silang dan rekombinasi gen, Pautan gen dan pemetaan kromosom, Perubahan struktur dan jumlah kromosom, Mutagenesis, Pendugaan rasio gen dan genotipe, Genetika Populasi dan HK Hardy-Weinberg, Pewarisan kuantitatif Rangkai kelamin dan penentuan jenis kelamin *Concept and History of Genetics, Cell mechanisms and plant life cycles, Genetic Material (DNA and RNA), Law of Inheritance of Traits I (Mendel's Law), Law of Inheritance of Characters II (Gene interactions), Crossing over and recombination of genes, Crossing over and recombination of genes, Gene linkage and chromosome mapping, Changes in structure and number of chromosomes, Mutagenesis, Estimation of gene and genotype ratios, Population Genetics and HK Hardy-Weinberg, Quantitative inheritance of sex chains and sex determination*	
Persyaratan belajar dan ujian serta bentuk ujian	Learning methods: lectures, discussions, assignments (review, case study)	

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Reading list</td><td>1. Shahzad, A., Ullah, S., Dar, A. A., Sardar, M. F., Mehmood, T., Tufail, M. A., & Haris, M. 2021. Nexus on climate change: Agriculture and possible solutions to cope future climate change stresses. Environmental Science and Pollution Research, 28, 14211-14232.
2. Gao, C. 2021. Genome engineering for crop improvement and future agriculture. Cell, 184(6), 1621-1635.
3. Kilian, B., Dempewolf, H., Guarino, L., Werner, P., Coyne, C., & Warburton, M. L. 2021. Crop Science special issue: Adapting agriculture to climate change: A walk on the wild side. Crop Science, 61(1), 32-36.
4. Qaim, M. 2020. Role of new plant breeding technologies for food security and sustainable agricultural development. Applied Economic Perspectives and Policy, 42(2), 129-150.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Statistika Pertanian *Agricultural Statistics*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	FP191118 *FP191118*
Kursus (jika ada) ***Course (if applicable)***	Statistika Pertanian *Agricultural Statistics*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Hery Nirwanto, MP
Pengajar ***Lecturer***	Dr. Ir. Hery Nirwanto, MP Dr. Ir. Tri Mudjoko, MP Dita Megasari, SP, M.Si Dr. Ir. Moch Arifin, MT Prof. Dr. Ir. Juli Santosa, MP Saefurrohman, SP, M.Sc Dr. Dra. Sutini, M.Pd Ramadhani Mahendra K, SP, MP, M.Sc
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu

	Case study : *1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice* : *1 x 170 = 170 minutes per week*	
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan pengertian dan perananan statistika dalam bidang Agroteknologi, mengidentifikasi jenis dan skala pengukuran data dan memberi contohnya. Mahasiswa mampu membuat barisan data tersusun dan menyajikan dalam bentuk tabel dan grafik, menghitung ukuran pemusatan dari satu set data pengamatan. Mahasiswa mampu menjelaskan dan menggunakan distribusi peluang dan perumusan hipotesis dalam bidang Agroteknologi, serta menentukan persamaan regresi linier sederhana dari data yang diperoleh. Mahasiswa mampu memahami dan menyelesaikan soal-soal dengan analisis variansi satu arah, rancangan acak lengkap, uji-uji perbandingan berganda BNT dan BNJ, Dunnett dan Duncan, ortogonal kontras dan polinomial. Mahasiswa mampu menghitung dan mengaplikasikan RBSL, percobaan faktorial, RPT berbasis RAL dan RAK serta mengintepretasikan hasil analisisnya. *Student capable to explain the meaning and role of statistics in the field of Agrotechnology, identify the type and scale of data measurement and give examples.* *Student capable to make arranged data rows and present them in tabular and graphical form, calculate the measure of centering from a set of observation data.* *Student capable to explain and use chance distribution and hypothesis formulation in the field of Agrotechnology, and determine simple linear regression equations from the data obtained.* *Student capable to understand and solve problems with one-way analysis of variance, complete randomized design, multiple comparison tests BNT and BNJ, Dunnett and Duncan, orthogonal contrasts and polynomials.* *Student capable to calculate and apply RBSL, factorial experiment, RPT based on RAL and RAK and interpret the results of the analysis.*	CPL 5 CPL 5 CPL 5, CPL 3 CPL 7 CPL 12 *PLO 5* *PLO 5* *PLO 5, PLO 3* *PLO 7* *PLO 12*
Isi ***Content***	4. Pengertian dan perananan statistika dalam bidang Agroteknologi, identifikasi jenis dan skala pengukuran data dan memberi contohnya.	

	5. Membuat barisan data tersusun dan menyajikan dalam bentuk tabel dan grafik. 6. Ukuran pemusatan dari satu set data pengamatan. 7. DIstribusi peluang kontinyu dalam bidang Agroteknologi. 8. Parameter distribusi peluang diskrit dalam bidang Agroteknologi. 9. Pengetahuan tentang perumusan hipotesis. 10. Menentukan persamaan regresi linier sederhana dari data yang diperoleh. 11. Menyelesaikan soal-soal dengan analisis variansi satu arah. 12. Menyelesaikan soal-soal percobaan dengan rancangan acak lengkap. 13. Menyelesaikan soal-soal dengan uji-uji perbandingan berganda BNT dan BNJ, Dunnett dan Duncan. 14. Menyelesaikan soal-soal ortogonal kontras dan polinomial. 15. Menghitung dan mengaplikasikan RBSL. 16. Mengaplikasikan percobaan faktorial dan menginterpretasikan hasil analisisnya. 17. Mengaplikasikan RPT berbasis RAL dan RAK , menghitung serta menginterpretasikan hasil analisisnya. *1. Understanding and role of statistics in the field of Agrotechnology, identifying types and scales of data measurement and giving examples.* *2. Create arranged data rows and present them in the form of tables and graphs.* *3. A measure of centrality of a set of observational data.* *4. Distribution of continuous opportunities in the field of Agrotechnology.* *5. Discrete opportunity distribution parameters in the field of Agrotechnology.* *6. Knowledge of hypothesis formulation.* *7. Determine a simple linear regression equation from the data obtained.* *8. Solve problems with one-way analysis of variance.* *9. Solve experimental questions with a completely randomized design.* *10. Solving questions with multiple comparison tests BNT and BNJ, Dunnett and Duncan.* *11. Solve contrast orthogonal and polynomial problems.* *12. Calculating and applying RBSL.* *13. Apply factorial experiments and interpret the results of the analysis.* 14. *Applying RPT based on RAL and RAK, calculating and interpreting the analysis results.*
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Learning methods: lectures, discussions, assignments (review, case study) Exam requirements: Minimum 75% attendance to take the final exam Question Form: True-False, Multiple Choice, and Essay or Assignment ● Final Score Components: ● Final Exam 35% ● Middle Exam 25% ● Structured Tasks 20% ● Quiz 20%

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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Daftar bacaan ***Reading list***	1. Aqil, M., & Efendi, R. 2021. Aplikasi spss dan sas untuk perancangan percobaan: Aplikasi pertanian, aplikasi peternakan, aplikasi kehutanan dan aplikasi mipa. Absolute Media. 2. Furqon. 2016. Statistika Terapan untuk Penelitian. CV. Alfabet. Bandung. 3. Kariyasa, K., Susanti, A. A., & Waryanto, B. (2018). Statistika Pertanian 2018 Agricultural Statistics. Pusat Data dan Sistem Informasi Pertanian Kementerian Pertanian Republik Indonesia, 157-158. 4. Mamondol, M. R. 2021. *Dasar-dasar statistika*. Scopindo Media Pustaka. 5. Sholikhah, S. N., Widaningsih, R., Muliany, P. H., Heni, T., & Suryani, R. (2017). Statistika pertanian 2017. Jakarta: Pusat Data dan Sistem Informasi Pertanian Kementrian Pertanian Republik Indonesia.

SEMESTER 3

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Agama Islam *Islam Religion*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UV141101 *UV141101*
Kursus (jika ada) ***Course (if applicable)***	Agama Islam *Islam Religion*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Fazlul Rahman, Lc., MA.Hum
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu*
Angka kredit ***Credit point***	2 SKS *2 credits or 3.2 ECTS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menerapkan ajaran keagamaan dan nilai-kemanusian sesuai dengan karakter bela negara	CPL-1
	Mahasiswa mampu menganalisis permasalahan sosial keagamaan dan kenegaraan dengan kritis dan inovatif	CPL-2
	Mahasiswa mampu mengkompromikan keragaman budaya, agama, dan kepercayaan sesuai dengan ajaran Islam	CPL-3
	Mahasiswa mampu merealisasikan kehidupan harmoni sesuai dengan nilai Pancasila dan UUD 1945	CPL-3
	Mahasiswa mampu menerapkan ajaran Hubbul wathon minal Iman (cinta tanah air adalah Sebagian dari iman)	CPL-5
	Mahasiswa mampu membuktikan hasil kinerja sesuai dengan etika akademik dan profesi yang berlaku	CPL-6
	Students capable of applying religious teachings and human values in accordance with the character of defending the country	*PLO-1*
	Students to capable of analyzing socio-religious and state problems critically and innovatively	*PLO-2*
	Students capable of compromising cultural diversity, religion, and belief in accordance with Islamic teachings	*PLO-3*
	Students capable of realizing a harmonious life in accordance with the values of Pancasila and the 1945 Constitution	*PLO-3*
	Students capable of applying the teachings of Hubbul wathon minal Iman (love of one's country is part of faith)	*PLO-5*
	Student can demonstrate a responsible attitude according to academic ethics and professional ethics	*PLO-6*
Isi ***Content***	Mata Kuliah ini memberikan kompetensi dasar bagi mahasiswa untuk dapat memahami konsep-konsep kunci dalam Agama Islam dan pengimplementasiannya dalam kehidupan sehari-hari yang berorientasi pada penguatan pola pikir keilmuan integratif komprehensif dan penguatan sikap bela negara. *This course provides basic competencies for students to be able to understand key concepts in the Islamic religion and their implementation in daily life which is oriented towards strengthening a comprehensive integrative scientific mindset and strengthening the attitude of defending the country.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Learning methods: lectures, discussions, assignments (review, case study) Exam requirements: Minimum 75% attendance to take the final exam Question Form: True-False, Multiple Choice, and Essay or Assignment ● Final Score Components: ● Final Exam 35% ● Middle Exam 25% ● Structured Tasks 20% ● Quiz 20%	

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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive
Daftar bacaan ***Reading list***	1. Pendidikan Agama Islam, TIM MKPK Agama Islam UPN "Veteran" Jatim. 2023. 2. Pendidikan Agama Islam Perguruan Tinggi. 2014. Dr.Syahidin, M.Pd., 3. Dr.Andi Hadiyanto, M.A., Penerbit Kementrian P dan K. 4. Abdillah Toha*, Buat Apa Beragama*. 2020. Bandung: Mizan. 5. Zaenal Abidin 2020. *Fiqih Ibadah.* Sleman: Deepublish.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Agama Kristen *Christian Religion*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UV191107 *UV191107*
Kursus (jika ada) ***Course (if applicable)***	Agama Kristen *Christian Religion*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Jusak Tjipto Santoso, M.Th., M.Pd
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu*
Angka kredit ***Credit point***	2 SKS *2 credit or 3.2 ETCS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menerapkan ajaran keagamaan dan nilai-nilai kemanusian sesuai dengan karakter bela negara Mahasiswa mampu menganalisis permasalahan sosial keagamaan dan kenegaraan dengan kritis dan inovatif Mahasiswa mampu mengkompromikan keragaman budaya, agama, dan kepercayaan sesuai dengan ajaran Kristen Mahasiswa mampu merealisasikan kehidupan harmonis sesuai dengan nilai Pancasila dan UUD 1945 Mahasiswa mampu menerapkan ajaran cinta tanah air sebagian dari iman Mahasiswa mampu membuktikan hasil kinerja sesuai dengan etika akademik dan profesi yang berlaku *Students are able to apply religious teachings and human values in accordance with the character of defending the country* *Students are able to analyze socio-religious and state problems critically and innovatively* *Students are able to compromise cultural diversity, religion and belief in accordance with Christian teachings* *Students are able to realize a harmonious life in accordance with the values of Pancasila and the 1945 Constitution* *Students are able to apply the teachings of patriotism as part of their faith* *Students are able to prove performance results in accordance with applicable academic and professional ethics*	CPL 1 CPL 2 CPL-1 CPL-2 CPL-2 CPL-2 *PLO 1* *PLO 2* *PLO 1* *PLO 2* *PLO 2* *PLO 2*
Isi ***Content***	1. Konsep Penciptaan dan Kebutuhan Beragama 2. Konsep Allah dalam perspektif iman Kristen dan keunikannya. 3. *Camp* Mahasiswa (OMKB) 4. Pendekatan doktrinal: penciptaan manusia, mandat budaya, kebutuhan beragama. 5. Integritas dan Komitmen 6. Gereja dalam pengertian, sifat dan tugasnya. 7. Dosa: Pengertian, sifat, akibat dosa dan solusinya. 8. Kristologi dengan isu-isu yang ada. 9. Integrasi Iman dan Ilmu, Pluralisme-intoleransi , Radikalisme) 10. Alkitab 11. Presentasi Isu-Isu Etika dalam Masyarakat 12. Kepemimpinan Kristen 13. Peacemaker dalam keragaman di Indonesia *1. The Concept of Creation and Religious Necessity* *2. The concept of God in the perfection of Christian faith and its uniqueness.* *3. Student Camp (OMKB)* *4. Doctrinal approach: human creation, cultural mandate, religious necessity.*	

<table>
<tr><td></td><td>5. Integrity and Commitment
6. The Church in its meaning, nature and duties.
7. Sin: Definition, nature, consequences of sin and the solution.
8. Christology with existing issues.
9. Integration of Faith and Science, Pluralism-intolerance, Radicalism)
10. Bible
11. Presentation of Ethical Issues in Society
12. Christian Leadership
13. Peacemakers in diversity in Indonesia</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Learning methods: lectures, discussions, assignments (review, case study)
Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
● Middle Exam 25%
● Structured Tasks 20%
● Quiz 20%

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<tr><td>Media yang digunakan
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Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>1. Harmadi, M., & Jatmiko, A. (2020). Pembelajaran efektif pendidikan agama kristen generasi milenial. PASCA: Jurnal Teologi dan Pendidikan Agama Kristen, 16(1), 62-74.
2. Harianto, G. P. (2021). Pendidikan Agama Kristen dalam Alkitab dan dunia pendidikan masa kini. PBMR ANDI.
3. Kemenristekdikti. 2016. Pendidikan Agama Kristen Untuk Perguruan Tinggi. Jakarta: Dirjen Belmawa Kemenristekdikti
4. Simatupang, H., Simatupang, R., Th, S., Napitupulu, T. M., & PAK, S. (2020). Pengantar Pendidikan Agama Kristen. Penerbit Andi.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Agama Katolik *Catholic Religion*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UV191107 *UV191107*
Kursus (jika ada) ***Course (if applicable)***	Agama Katolik *Catholic Religion*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Sonny Williams, S.S, M.Hum
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu*
Angka kredit ***Credit point***	2 SKS *2 credit or 3.2 ETCS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus hadir 75% *Students must be present is 75%*

<table>
<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td colspan="2">-</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and theircorresponding PLOs</td><td>Bertakwa kepada Tuhan Yang Maha Esa dan mampu menunjukkan sikap religius;
Menjunjung tinggi nilai kemanusiaan dalam menjalankan tugas berdasarkan agama, moral,dan etika;
Berkontribusi dalam peningkatan mutu kehidupan bermasyarakat, berbangsa, bernegara,dan
kemajuan peradaban berdasarkan nilai dan ajaran Katolik;
Bekerja sama dan memiliki kepekaan sosial serta kepedulian terhadap masyarakat dan lingkungan

Have faith in God Almighty and be able to show a religious attitude;
Uphold human values in carrying out duties based on religion, morals and ethics;
Contribute to improving the quality of life in society, nation, state, etc progress of civilization based on Catholic values and teachings;
Work together and have social sensitivity and concern for the community and environment</td><td>CPL-1
CPL-2
CPL-3
CPL-4

PLO-1
PLO-2
PLO-3
PLO-4</td></tr>
<tr><td>Isi
Content</td><td colspan="2">1. Panggilan Hidup Manusia menurut Kitab Suci
2. Relasi Manusia dengan Diri, Sesama, Lingkungan, dan Tuhan
3. Iman dihidupi dalam pluralitas
4. Karya Yesus Kristus dan Kerajaan Allah
5. Gereja yang memasyarakat
6. Etika Kristiani

1. Call to Human Life according to the Holy Scriptures
2. Human Relations with Self, Others, Environment, and God
3. Faith is lived in plurality
4. The work of Jesus Christ and the Kingdom of God
5. Church that is popular in society
6. Christian Ethics</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td colspan="2">Learning methods: lectures, discussions, assignments (review, case study)
Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
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	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Agama Budha *Buddhism Religion*	
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*	
Kode ***Code***	UV141101 *UV141101*	
Kursus (jika ada) ***Course (if applicable)***	Agama Budha Buddhism Religion	
Semester ***Semester***	III (Tiga) *3rd (Third)*	
Penanggung Jawab Modul ***Person Responsible for theModule***	Suranto, S. Ag, M. A	
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*	
Bahasa ***Language***	Indonesia *Indonesian*	
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*	
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	Learning methods: lectures, discussions, assignments, case study	
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu*	
Angka kredit ***Credit point***	2 SKS *2 credits or 3.2 ECTS*	
Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai	Menguasai konsep-konsep dasar keagamaan dan penerapannya dalam kehidupan sehari-hari	CPL-2

<table>
<tr><td>Learning outcomes and their corresponding PLOs</td><td>sesuai dengan agama yang dianut oleh masing-masing serta mampu mengembangkan sikap toleransi sebagai bagian dari Bangsa Indonesia dan masyarakat ilmiah.

Mastering basic religious concepts and their application in everyday lifein accordance with the religion adhered to by each and able to develop an attitude of tolerance as part of the Indonesian nation and scientific community</td><td>PLO-2</td></tr>
<tr><td>Isi
Content</td><td colspan="2">1. Bagaimana Kerangka dan Isi Kitab Suci Tipitaka/Tripitaka
2. Bagaimana Makna dan Tujuan Hidup Manusia yang Bersumber dari Ajaran Buddha
3. Bagaimana Peranan Hukum Universal Buddha dalam Kehidupan Sehari-Hari
4. Bagaimana Makna Ketuhanan yang Maha Esa dalam Ajaran Buddha
5. Bagaimana Nilai dan Norma Moral (Sila) sebagai Landasan dan Pola Hidup
6. Bagaimana Harmoni Iptek dan Seni dalam Kehidupan.
7. Bagaimana Konsep Masyarakat Buddha dan Konstruksi Sikap Kerukunan Antarumat Beragama
8. Bagaimana Dinamika Budaya dan Politik Buddha dalam Konteks Kebangsaan Indonesia
9. Bagaimana Bhavana Membentuk Batin Bersih Manusia Berkarakter

1. What is the Framework and Contents of the Tipitaka/Tripitaka Holy Book
2. How the meaning and purpose of human life originates from Buddhist teachings
3. How does Universal Buddhist Law play a role in everyday life
4. What is the meaning of the belief in the Almighty God in Buddhist teachings
5. How Moral Values and Norms (Sila) serve as a Foundation and Lifestyle
6. How to Harmonize Science and Technology and Art in Life.
7. What is the Concept of Buddhist Society and the Construction of Attitudes of Inter-Religious Harmony?
8. What are the Dynamics of Buddhist Culture and Politics in the Indonesian National Context?
9. How Bhavana Forms a Clean Mind in a Human with Character</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td colspan="2">Learning methods: lectures, discussions, assignments (review, case study)
Exam requirements: Minimum 75% attendance to take the final exam
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● Final Exam 35%
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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive
Daftar bacaan ***Reading list***	1. Direktorat pembelajaran. 2016. Pendidikan Agama Budha. Ditjen Belmawa,Kemenristekdikti. Jakarta. 2. Djayaputra, G. (2021). Marhaenisme, pancasila, dan trisakti: antitesis korupsi dalam perspektif agama buddha. Jurnal Pembumian Pancasila, 1(2), 102-111.Sena, I. G. M. W. (2015). Konsep Kosmologi Dalam Perspektif Agama Buddha. VIDYA SAMHITA: Jurnal Penelitian Agama, 1(1). 3. Wijoyo, H., & Nyanasuryanadi, P. (2020). Etika Wirausaha Dalam Agama Buddha. Jurnal Ilmu Komputer dan Bisnis, 11(2), 2531-2536.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Agama Hindu *Hindu Religion*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UV191107 *UV191107*
Kursus (jika ada) ***Course (if applicable)***	Agama Hindu *Hindu Religion*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for theModule***	Niluh P K, Se, S.Pdh, M.Pdh
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
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Angka kredit ***Credit point***	2 SKS *2 credit or 3.2 ETCS*
Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*
Prasyarat wajib ***Mandatory prerequisites***	-

Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menerapkan ajaran keagamaan dan nilai-kemanusian sesuai dengan karakter bela negara	CPL-1
	Mahasiswa mampu menganalisis permasalahan sosial keagamaan dan kenegaraan dengan kritis dan inovatif	CPL 2
	Mahasiswa mampu mengompromikan keragaman budaya, agama, dan kepercayaan sesuai dengan ajaran Islam	CPL-1
	Mahasiswa mampu merealisasikan kehidupan harmoni sesuai dengan nilai Pancasila dan UUD 1945	CPL 2
	Mahasiswa mampu mewujudkan Sradha dan Bhakti kehadapan Ida Sang Hyang Widhi Wasa (Tuhan Yang Maha Esa)	CPL 2
	Mahasiswa mampu membuktikan hasil kinerja sesuai dengan etika akademik dan profesi yang berlaku	CPL 2
	Mahasiswa mampu membuktikan hasil kinerja sesuai dengan etika akademik dan profesi yang berlaku	CPL 2
	Students are able to apply religious teachings and human values in accordance with the character of defending the country	*PLO-1*
	Students are able to analyze socio-religious and state problems critically and innovatively	*PLO 2*
	Students are able to compromise cultural diversity, religion and belief in accordance with Islamic teachings	*PLO-1*
	Students are able to realize a harmonious life in accordance with the values of Pancasila and the 1945 Constitution	*PLO 2*
	Students are able to realize Sradha and Bhakti before Ida Sang Hyang Widhi Wasa (God Almighty)	*PLO 2*
	Students are able to prove performance results in accordance with applicable academic and professional ethics	*PLO 2*
Isi ***Content***	1. Agama: Pengertian konsep, macam, dan ruang lingkup 2. Konsepsi Ke-Tuhan an : Brahma Widya, Catur Marga, Catur Yoga, Spiritual dan Dharma 3. Etika dan Moralitas 4. Manusia: hakikat manusia Hindu, Generasi Muda Hindu yang Suputra 5. Ilmu Pengetahuan Teknologi dalam perspektif Hindu 6. Kerukunan antar umat beragama 7. Ilmu Politik menurut perspektif Hindu, Hukum Hindu dan RTA *1. Religion: Understanding concepts, types and scope* *2. Conception of God: Brahma Widya, Catur Marga, Catur Yoga, Spiritual and Dharma* *3. Ethics and Morality* *4. Humans: the nature of Hindu humans, the Suputra Young Hindu Generation* *5. Science and Technology from a Hindu perspective* *6. Harmony between religious communities* *7. Political Science from a Hindu perspective, Hindu Law and RTA*	
Persyaratan belajar dan ujian serta bentuk ujian	Learning methods: lectures, discussions, assignments (review, case study) Exam requirements: Minimum 75% attendance to take the final exam	

<table>
<tr>
<td>Study and examination requirements and forms of examination</td>
<td>Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
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</table>
</td>
</tr>
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</tr>
<tr>
<td>Daftar bacaan
Reading list</td>
<td>Primary
Pendidikan Agama Hindu untuk Perguruan Tinggi, Tim Penyusun: Hanuman sakti / 1997

Proponent
1. Drs. Ketut Wiyana, Bagaimana Hindu Menghayati Tuhan (Manik Geni, 1994)
2. Drs. I. B Punya Atmaja, Panca Sradha (PHDI PUSAT, 1974)
3. Dr. I Made Titib, Weda Sabda Suci Pedoman Praktis Kehidupan (Paramita, 1996)
4. G. Pudja MA, Teologi Hindu (Mayasari, 1997)
5. M. Maswinnara, Bhagawadgita (Paramita, 1998)
6. Drs. Ketut Wiyana, Niti Sastra (Ditjen Hindu dan Budha, 1982)
7. Koentjananingrat, Manusia dan Kebudayaan Indonesia (Gramedia, 1978)
8. G. Pudja MA, Sarasamuscaya (Mayasari, 1980)
9. Sudharta, Manawa Dharma Sastra (Hanuman Sakti, 1986)</td>
</tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Bela Negara *Education of State Defense*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UV191106 *UV191106*
Kursus (jika ada) ***Course (if applicable)***	Bela Negara *Education of State Defense*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for theModule***	Dra. Sri Wibawani. M.Si
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Out Bond (6 hours)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ECTS*
Persyaratan sesuai ketentuan ujian	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Requirements according to the examination regulations		
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan dasar pemikiran, ruang lingkup, prinsip-prinsip, tujuan, dan spektrum bela negara. Mahasiswa mampu memahami nilai, etika, moral karakter dan jati diri bangsa. Mahasiswa memiliki karakter bela negara seperti yakin akan kesaktian pancasila, cinta tanah air, sadar hak dan kewajiban, rela berkorban. Mahasiswa memiliki kemampuan awal bela negara. Mahasiswa mengenal dan memahami faktor-faktor yang mempengaruhi kesadaran bela negara, kewaspadaan nasional, dan kebijakan pembinaan kesadaran bela negara. Mahasiswa mampu memahami pemerintahan dan kepemerintahan yang baik, bersih, dan berwibawa, berjiwa anti korupsi. Mahasiswa mampu mengembangkan dan membudayakan nilai-nilai bela negara sesuai dengan profesinya. *Students capable of explaining the rationale, scope, principles, objectives, and spectrum of national defends.* *Students are capable of understanding values, ethics, morals, and national identity.* *Students have the character of defending the country, such as believing in the power of Pancasila, loving their country, being aware of their rights and obligations, and being willing to make sacrifices.* *Students have the initial ability to defend the country.* *Students understand and understand the factors that influence awareness of national defends, national interests, and policies for fostering awareness of national defends.* *Students capable of understanding good, clean, and dignified government and governance, with an anti-corruption spirit.* *Students capable of developing and cultivating the values of defending the country in accordance with their profession.*	CPL-2 CPL-2 CPL-6 CPL-8 CPL-5 CPL-7 CPL-5 *PLO-2* *PLO-2* *PLO-6* *PLO-8* *PLO-5* *PLO-7* *PLO-5*
Isi ***Content***	Mata kuliah ini mengulas pengertian, definisi, prinsip-prinsip, tujuan dan spektrum bela negara memahami nilai, etika, moral karakter dan jati diri bangsa serta memiliki karakter bela negara seperti yakin akan kesaktian pancasila, cinta tanah air, sadar hak dan kewajiban, rela berkorban dan kepemerintahan yang baik, bersih, dan berwibawa, berjiwa anti korupsi, serta memiliki kepekaan sosial yang tinggi dalam berkarya dan berkehidupan bermasyarakat. *This course reviews the meaning, definition, principles, objectives, and spectrum of defending the country, understanding the values, ethics, morals, character, and identity of the nation, and having the character of defending the country, such as believing in the power of Pancasila, loving*	

<table>
<tr><td></td><td>the country, being aware of rights and obligations, being willing to make sacrifices. and governance that is good, clean, and dignified, has an anti-corruption spirit and has high social sensitivity in working and living in society.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Learning methods: lectures, discussions, assignments (review, case study)
Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
● Middle Exam 25%
● Structured Tasks 20%
● Quiz 20%

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<tr><td>Daftar bacaan
Reading list</td><td>1. Tim Lembaga Administrasi Negara Republik Indonesia, 2019, Kesiapsiagaan Bela Negara, Lembaga Administrasi Negara Republik Indonesia
2. Letkol Dr. Kusuma, 2018, Pengantar Bela Negara untuk Perguruan Tinggi, Erlangga
3. Tim Direktorat Jenderal Potensi Pertahanan, 2018, Tatanan Dasar Bela Negara, Kementerian Pertahanan Republik Indonesia.
4. Tim Kementerian Pertahanan Republik Indonesia, 2017, Pedoman Strategis Pertahanan Nirmiliter, Kementerian Pertahanan Republik Indonesia</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Mikrobiologi Pertanian *Agricultural Microbiology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 141102 *PG 141102*
Kursus (jika ada) ***Course (if applicable)***	Mikrobiologi Pertanian *Agricultural Microbiology*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Arika Purnawati, MP.
Pengajar ***Lecturer***	Dr. Ir. Arika Purnawati, MP. Dr. Ir. Yenny Wuryandari, MP. Dr. Ir. Tri Mujoko, MP., Dr. Ir. Sri Wiyatiningsih, MP. Noni Rahmadini, SP., MSc. Dra. Endang Triwahyu Prasetyawati, MP. Safira Rizka Lestari, SP., MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu

	Case study : *1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice* : *1 x 170 = 170 minutes per week*	
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Biologi Pertanian *Agricultural Biology*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan fungsi organel sel mikroorganisme, struktur organ mikroorganisme dan reproduksi mikroorganisme dalam hubungannya dengan proses fisiologis dan metabolisme mikroorganisme Mahasiswa mampu menganalisis keterkaitan faktor genetik dan lingkungan pada mikroorganisme serta peranan bioteknologi. Mahasiswa mampu menjelaskan dan menganalisis peran mikroorganisme, arthopoda dan biota tanah dalam upaya peningkatan kapasitas sumber daya lahan dan perlindungan tanaman terhadap hama penyakit dalam rangka peningkatan produksi tanaman. Mahasiswa mampu menghitung dan menganalisis populasi mikroorganisme bakteri dan jamur. Mahasiswa mampu menguasai teknik molekuler mikroorganisme. *Students are able to explain the function of microorganism cell organelles, the structure of microorganism organs and the reproduction of microorganisms in relation to the physiological processes and metabolism of microorganisms* *Students are able to analyze the relationship between genetic and environmental factors in microorganisms and the role of biotechnology.* *Students are able to explain and analyze the role of microorganisms, arthropods and soil biota in efforts to increase land resource capacity and protect plants against pests and diseases in order to increase plant production.* *Students are able to count and analyze populations of bacterial and fungal microorganisms.* *Students are able to master molecular techniques for microorganisms.*	CPL-2 CPL-4 CPL-5 CPL-5 CPL-5 *PLO-2* *PLO-4* *PLO-5* *PLO-5* *PLO-5*
Isi ***Content***	1. Pengertian mikroorganisme dan kegunaannya dalam bidang pertanian, bioteknologi, pangan, dan lingkungan 2. Teknik aseptik : sterilisasi alat, dan pembuatan media kultur mikroorganisme bakteri dan jamur 3. Kebutuhan nutrisi mikroorganisme 4. Pertumbuhan dan perkembangan mikroorganisme 5. Pengaruh faktor biotik dan abiotik terhadap fase pertumbuhan dan perkembangan mikroorganisme	

<table>
<tr><td></td><td>6. Teknik penghitungan mikroorganisme
7. Evaluasi Tengah Semester (ETS)
8. Teknik eksplorasi, isolasi, purifikasi, rejuvenasi, dan penyimpanan mikroorganisme bakteri dan jamur
9. Teknik perhitungan dan analisis populasi mikroorganisme bakteri dan jamur
10. Teknik molekuler mikroorganisme : PCR, ELISA, dan Cloning
11. Teknik perbanyakan mikroorganisme bermanfaat
12. Evaluasi Akhir Semester (EAS)

1. Understanding microorganisms and their uses in the fields of agriculture, biotechnology, food and the environment
2. Aseptic technique: sterilization of tools and making culture media for bacterial and fungal microorganisms
3. Nutritional needs of microorganisms
4. Growth and development of microorganisms
5. The influence of biotic and abiotic factors on the growth and development phases of microorganisms
6. Technique for counting microorganisms
7. Midterm Exam (ETS)
8. Techniques for exploration, isolation, purification, rejuvenation and storage of bacterial and fungal microorganisms
9. Techniques for calculating and analyzing populations of bacterial and fungal microorganisms
10. Molecular techniques for microorganisms: PCR, ELISA, and cloning
11. Techniques for propagating useful microorganisms
12. Final Semester Examination (EAS)</td></tr>
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	1. Purnawati, A., W.S. Harjani, W. Windriyanti. 2018. Mikrobiologi : Bakteri Endofit. Unair. Press. Surabaya. 2. Purnawati, A. 2022. Monograf. Medium Alternatif untuk Bakteri Endofit. Deepublish. Yogyakarta. 3. Mades Fifendy. 2017. Mikrobiologi. Edisi Pertama. Prenadamedia Group. Indonesia. 4. Burhanuddin Ihsan. 2021. Dasar-Dasar Mikrobiologi. Edisi Pertama. Insan Cendikia Mandiri, Indonesia. 5. Retnaningrum, E.,S. Darmasiwi, A. R. Siregar. 2016. Bahan Ajar Mikrobiologi. Gadjah Mada Univ. Press. Yogyakarta.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Agroinformatika *Agroinformatics Technology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 141123 *PG 141123*
Kursus (jika ada) ***Course (if applicable)***	Agroinformatika *Agroinformatics*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Ir. Kemal Wijaya, MT.
Pengajar ***Lecturer***	Ir. Kemal Wijaya, MT. Ir. Siswanto, MT. Dr.Ir. Purnomo Edi Sasongko, MP. Dr.Ir. Hery Nirwanto, MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per minggu*
Angka kredit	3 SKS

Credit point	*3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu memahami konsep Teknologi Informasi dan Komunikasi (TIK) Mahasiswa mampu menjelaskan mengenai teknologi dalam mendukung pertanian Mahasiswa mampu memecahkan permasalahan pertanian melalui teknologi *Students are able to understand the concept of Information and Communication Technology (ICT)* *Students are able to explain technology in supporting agriculture* *Students are able to solve agricultural problems through technology*	CPL-4 CPL-4 CPL-5 *PLO-4* *PLO-4* *PLO-5*
Isi ***Content***	Mata kuliah ini mempelajari konsepsi Teknologi Informasi dan Komunikasi (TIK) dan implementasi TIK pada sektor pertanian serta mendeskripsikan pertanian presisi, pertanian cerdas, pertanian digital, pertanian modern dan implementasinya untuk mendukung Revolusi Industri 4.0 di lapangan. pertanian modern, memaparkan pemanfaatan Artificial Intelligence dan Internet of Things dalam bidang pertanian dalam bentuk tugas terstruktur tentang pembelajaran untuk mencari alternatif solusi studi kasus. *This course study about the conception of Information and Communication Technology (ICT) and the implementation of ICT for the agricultural sector as well as describe precision agriculture, smart agriculture, digital agriculture, modern agriculture and implementation to support the Industrial Revolution 4.0 in the field of modern agriculture, describe the use of Artificial Intelligence and the Internet of Things in the field agriculture in the form of structured assignments about learning to find alternative case study solutions.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Learning methods: lectures, discussions, assignments (review, case study) Exam requirements: Minimum 75% attendance to take the final exam Question Form: True-False, Multiple Choice, and Essay or Assignment ● Final Score Components: ● Final Exam 35% ● Middle Exam 25% ● Structured Tasks 20% ● Quiz 20%	

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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive
Daftar bacaan ***Reading list***	1. Sanjay Chaudhary, S., Biradar, C.M., Divakaran, S.,·and Raval, M.S. 2023. Digital Ecosystem for Innovation in Agriculture. Springer Nature Singapore Pte Ltd. 2. Ozguven, M.M. 2023. The Digital Age in Agriculture. CRC Press. Taylor & Francis Group, LLC. Boca Raton. 3. Govind Singh Patel, Amrita Rai, Nripendra Narayan Das, R.P. Singh. 2021. Smart Agriculture, Emerging Pedagogies of Deep Learning, Machine Learning and Internet of Things. CRC Press. 244 p. 4. Prasant Kumar Pattnaik , Raghvendra Kumar , Souvik Pal & S. N. Panda (Editors). 2020. IoT and Analytics for Agriculture. Springer Nature. Singapore Pte Ltd. 5. Baohua Zhang and Jun Zhou. 2019. Agricultural Robots - Fundamentals and Applications. 144 p. Bogue, R. (2016), "Robots poised to revolutionise agriculture", Industrial Robot, Vol. 43 No. 5, pp. 450-456.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Pemuliaan Tanaman *Plant Breeding Technology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG141105 *PG141105*
Kursus (jika ada) ***Course (if applicable)***	Pemuliaan Tanaman *Plant Breeding*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Juli Santoso, MP.
Pengajar ***Lecturer***	1. Dr. Ir. Juli Santoso, MP 2. Dr. Ir. Ida Retno Muljani, MP 3. Dr. Ir. Makhziah, MP 4. Dr. Ir. Sukendah, MSc.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomi Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit	3 SKS

Credit point	*3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Genetika Pertanian *Agricultural Genetics*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menerangkan penjabaran masing-masing sub bidang pemuliaan tanaman, menggambarkan alur kerja kegiatan pemuliaan tanaman, dan mampu menggambarkan bagan proses introduksi tanaman menjadi varietas baru. Mahasiswa mampu menerangkan pengetahuan dan tahapan-tahapan program pemuliaan tanaman konvensional untuk tanaman menyerbuk silang serta kelebihan dan kekurangannya. Mahasiswa mampu menerangkan teknik hibridisasi dan penggunaan heritabilitas dalam pemuliaan tanaman. Mahasiswa mampu menerangkan penggunaan mutasi, heterosis, *inbreeding* dan pemanfaatannya pada pemuliaan tanaman. Mahasiswa mampu menerangkan dan melaksanakan teknik pemuliaan tanaman inkonvensional. *Students capable to explain the description of each sub-field of plant breeding, describing the workflow of plant breeding activities, and capable to draw a chart of the process of introducing plants into new varieties.* *Students capable to explain the knowledge and stages of conventional plant breeding programs for cross-pollinated plants as well as their advantages and disadvantages.* *Students capable to explain hybridization techniques and the use of heritability in plant breeding.* *Students capable to explain the use of mutation, heterosis, inbreeding and their use in plant breeding.* *Students capable to explain and implement unconventional plant breeding techniques*.	CPL-4 CPL-5 CPL-7 CPL-7 CPL-8 *PLO-4* *PLO-5* *PLO-7* *PLO-7* *PLO-8*
Isi ***Content***	1. Koleksi Plasma Nutfah 2. Hibridisasi 3. Persilangan Antar Spesies 4. Pemuliaan Tanaman Menyerbuk Sendiri 5. Pemuliaan Tanaman Menyerbuk Silang 6. Heritabilitas 7. Mutasi 8. Poliploidi 9. Male sterile 10. Heterosis dan varietas Hibrida	

<table>
<tr><td></td><td>11. Interaksi antara genotip dan lingkungan
12. Pemuliaan Inkonvensional
13. Pemuliaan Inkonvensional

1. Germplasm Collection
2. Hybridization
3. Crosses Between Species
4. Breeding Self-Pollinated Plants
5. Breeding Cross-Pollinated Plants
6. Heritability
7. Mutation
8. Polyploidy
9. Males sterilization
10. Heterosis and Hybrid varieties
11. Interaction between genotype and environment
12. Unconventional Breeding
13. Unconventional Breeding</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Learning methods: lectures, discussions, assignments (review, case study)
Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
● Middle Exam 25%
● Structured Tasks 20%
● Quiz 20%

<table>
<tr><th>Final Score</th><th>Letter</th><th>Number Quality</th><th>Final Score</th><th>Letter</th><th>Number Quality</th></tr>
<tr><td>≥ 80 – 100</td><td>A</td><td>4.00</td><td>≥ 58 – <64</td><td>C+</td><td>2.50</td></tr>
<tr><td>≥ 76 – <80</td><td>A--</td><td>3.75</td><td>≥ 54 – <58</td><td>C</td><td>2.00</td></tr>
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</table>
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<tr><td>Media yang digunakan
Media employed</td><td>Hardwares : Projector and screensr, reference book, sound system
Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>1. Karimah, A. Z., Siswoyo, T. A., Kim, K. M., & Ubaidillah, M. 2021. Genetic diversity of rice germplasm (Oryza sativa L.) of java island, Indonesia. Journal of Crop Science and Biotechnology, 24, 93-101.
2. Marwan, A. P., Munandar, A., Anwar, A., Syarif, A., & Hayati, P. D. 2022. Variability, heritability, and performance of 28 West Sumatran upland rice cultivars, Indonesia. Biodiversitas Journal of Biological Diversity, 23(2): 1058-1065.</td></tr>
</table>

	3. Priyadarshan, P. M. 2019. Plant Breeding: classical to modern. Springer. 4. Semiarti, E., Purwantoro, A., & Puspita Sari, I. 2020. Biotechnology approaches on characterization, mass propagation, and breeding of Indonesian orchids *Dendrobium lineale* (Rolfe.) and *Vanda tricolor* (Lindl.) with its phytochemistry. *Orchids Phytochemistry, Biology and Horticulture: Fundamentals and Applications*, 1-14. 5. Sulistyo, A., Indriani, F. C., Mejaya, M. J., Sugiharto, A. N., & Agranoff, J. 2019. Genetic diversity of Indonesian soybean (*Glycine max* L. Merrill) germplasm based on morphological and microsatellite markers. In *IOP Conference Series: Earth and Environmental Science,* 293(1). IOP Publishing.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Produksi Tanaman Hortikultura *Horticulture Production Technology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191107 *PG191107*
Kursus (jika ada) ***Course (if applicable)***	Teknologi Produksi Tanaman Hortikultura *Horticulture Production Technology*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Ramdan Hidayat, MS
Pengajar ***Lecturer***	Dr. Ir. Ramdan Hidayat, MS Dr. Felicitas Deru Dewanti, SP, MP Ir. Agus Sulistyono, MP Ir. Djarwatiningsih PS, MP
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomi Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit	3 SKS

Credit point	*3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu merencanakan dan menerapkan teknologi budidaya tanaman hortikultura dengan prinsip-prinsip pertanian berkelanjutan, secara efektif dan produktif. Mahasiswa mampu merencanakan untuk menerapkan teknologi produksi tanaman hortikultura berwawasan lingkungan. Mahasiswa mampu mengevaluasi dan menganalisis teknologi produksi tanaman hortikultura berdasarkan persyaratan tumbuh tanaman. Mahasiswa mampu berkreasi dan berinovasi dalam menerapkan teknologi produksi tanaman hortikultura ke dalam praktek bisnis. Mahasiswa mampu mengidentifikasi, merumuskan dan menyelesaikan masalah (berfikir analitis dan sintesis) secara kreatif dalam lingkup teknologi produksi tanaman hortikultura yang ramah lingkungan dalam lingkup global. *Students capable to plan and apply horticultural plant cultivation technology using sustainable agricultural principles, effectively and productively.* *Students capable to plan to apply environmentally friendly horticultural crop production technology.* *Students capable to evaluate and analyze horticultural crop production technology based on plant growing requirements.* *Students capable to be creative and innovate in applying horticultural plant production technology to business practices.* *Students capable to identify, formulate and solve problems (analytical and synthetic thinking) creatively within the scope of environmentally friendly horticultural crop production technology on a global scale..*	CPL 4 CPL 4 CPL 8 CPL 11 CPL 11, CPL 2 *PLO 4* *PLO 4* *PLO 8* *PLO 11* *PLO 11, PLO 2*
Isi ***Content***	Mata kuliah ini akan membahas dan mengembangkan pengetahuan: Definisi, karakter specifik dan implikasi bisnis komoditas hortikultura; Pengelompokan komoditas hortikultura dengan karakter tumbuhnya; Sejarah perkembangan komoditas hortikultura di tingkat Dunia dan di Indonesia; Ekologi pekarangan dan intensifikasi tanaman hortikultura di Indonesia; Sistem perbanyakan tanaman hortikultura dan menyelesaikan tugas pembibitan; Mengembangkan margin pemasaran produk dan estetika dalam hortikultura; Budidaya tanaman biofarmaka; Budidaya tanaman sayuran semusim; Budidaya tanaman buah; dan Budidaya tananam potting.	

<table>
<tr><td></td><td>This course will discuss and develop knowledge: Definition, specific characteristics and business implications of horticultural commodities; Grouping of horticultural commodities according to their growth characteristics; History of the development of horticultural commodities at world level and in Indonesia; Yard ecology and intensification of horticultural crops in Indonesia; Horticultural plant propagation system and completing nursery tasks; Develop product marketing margins and aesthetics in horticulture; Cultivation of biopharmaceutical plants; Cultivation of annual vegetable crops; Cultivation of fruit plants; and Cultivation of potting plants.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Learning methods: lectures, discussions, assignments (review, case study)
Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
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● Quiz 20%

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Media employed</td><td>Hardwares : Projector and screensr, reference book, sound system
Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>1. Wahyudie, Tri. 2020. Pengelolaan Komoditas Hortikultura Unggulan Berbasis Lingkungan. Forum Pemuda Aswaja. Lombok Tengah.
2. Zamroni Salim, Ernawati M. 2017. Info Komoditi Tanaman Obat, . Badan Pengkajian dan Pengembangan Perdagangan, Kementerian Perdagangan RI, 94 hal
3. Irwan Hidayat dan Bambang S. .2017. Agribisnis Tanaman Obat dan Penerapan GAP di PT Sido Muncul.Prosiding Semnas 2017. FP UMJ . Webside: Jurnal.umj.ac.id/index.php/g
4. Yahia, E. M. (Ed.). (2019). Postharvest technology of perishable horticultural commodities. Woodhead Publishing.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Hama dan Penyakit Penting Tanaman *Plant Pests and Diseases of Importance*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191108 *PG191108*
Kursus (jika ada) ***Course (if applicable)***	Hama dan Penyakit Penting Tanaman *Plant Pests and Diseases of Importance*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Sri Wiyatiningsih, MP.
Pengajar ***Lecturer***	Dr. Ir. Sri Wiyatiningsih, M.P. Dr. Ir. Yenny Wuryandari, M.P. Dr. Ir. Wiwin Windriyanti, M.P. Ramadhani Mahendra Kusuma, S.P. M.P. M.Sc Dita Megasari, S.P., M.Si. Noni Rahmadhini, S.P., M.Sc. Safira Rizka Lestari, S.P., M.P.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Plant Protectiion* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu

	Practice : 1 x 170 = 170 minutes per minggu	
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Dasar Perlindungan Tanaman *Basic of Plant Protection*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa berkarakter bela negara, dengan indikasi cinta tanah air, kesadaran berbangsa dan bernegara, meyakini Pancasila sebagai ideologi negara, rela berkorban untuk bangsa dan negara, serta memiliki kemampuan awal bela negara. Mahasiswa mampu menerapkan pengetahuan ilmu tanaman dan konsep dasar produksi tanaman, tanah dan konsep dasar sumber daya lahan, serta hama dan penyakit tanaman dan konsep perlindungan tanaman terhadap hama penyakit secara terpadu. Mahasiswa mampu mendiagnosa, menganalisis, dan menyelesaikan permasalahan hama penyakit tanaman *Student commit to the ethical, moral, and character values of defending the country as a professional in agriculture.* *Student capable to apply the knowledge of plant Science, the basic concepts of plant production, land resources and soil science, and integrated concept of plant protection against of pests and diseases* *Student capable to apply knowledge to identify, diagnose, analyze, plan and apply integrated pest and plant disease control.*	CPL-1 CPL-4 CPL-10 *PLO-1* *PLO-4* *PLO-10*
Isi ***Content***	1. Mahasiswa mampu menemukan hama dan patogen penting pada berbagai tanaman (pangan, hortikultura, perkebunan, hutan dan peneduh, rempah dan obat-obatan). 2. Mahasiswa mampu menilai status hama dan patogen tanaman pada ekologi pertanian (penting atau tidak). 3. Mahasiswa mampu mengemukakan salah satu contoh bioekologi hama dan patogen tanaman, meliputi taksonominya, mekanisme dan gejala serangan, habitat dan ekosistemnya, serta penyebaran dan distribusinya. 4. Mahasiswa mampu menghitung kerusakan tanaman akibat serangan hama dan patogen secara kualitatif dan kuantitatif, dan mampu mengukur kerugian secara ekonomi. 5. Mahasiswa mampu mempraktekkan cara pengelolaan yang tepat hama dan patogen penting pada berbagai tanaman dengan cara-cara pengendaliannya yang sesuai dan mutakhir terhadap hama dan penyakit penting yang ada. 6. Mahasiswa mampu menyusun paper tentang hama atau penyakit penting pada tanaman (pangan, hortikultura, perkebunan, hutan dan	

peneduh, rempah dan obat-obatan) beserta bioekologi, pengelolaan, penghitungan kerusakan, dan analisis kerugian secara ekonomi secara mandiri atau kelompok, dan mampu mempresentasikan dan menjawab secara komprehensif diskusi dari paper yang telah disusunnya baik secara mandiri maupun kelompok.

1. *Students capable to find important pests and pathogens on various plants (food, horticulture, plantations, forests and shade, spices and medicines).*
2. *Students capable to assess the status of plant pests and pathogens in agricultural ecology (important or not).*
3. *Students capable to present an example of the bio ecology of plant pests and pathogens, including their taxonomy, attack mechanisms and symptoms, habitat and ecosystem, as well as their spread and distribution.*
4. *Students capable to calculate plant damage due to pest and pathogen attacks qualitatively and quantitatively, and capable to measure economic losses.*
5. *Students capable to practice appropriate management methods for important pests and pathogens on various plants with appropriate and up-to-date control methods for existing important pests and diseases.*
7. *Students capable to write papers about important pests or diseases in plants (food, horticulture, plantations, forests and shade, spices and medicines) along with bioecology, management, damage calculations and analysis of economic losses independently or in groups, and capable to present and comprehensively answer discussions on papers he has prepared both independently and in groups.*

Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination

Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:

- Final Exam 30%
- Middle Exam 20%
- Structured Tasks 30%
- Practice 20%

Final Grade	Letter Grade	Grade Point	Final Grade	Letter Grade	Grade Point
≥ 80 – 100	A	4.00	≥ 58 – <64	C+	2.50
≥ 76 – <80	A-	3.75	≥ 54 – <58	C	2.00
≥ 72 – <76	B+	3.50	≥ 50 – <54	C-	1.75
≥ 68 – <72	B	3.00	≥ 46 –<50	D+	1.50
≥ 64 – <68	B-	2.75	≥ 42 – <46	D	1.00
			0 - < 42	E	0.00

Media yang digunakan
Media employed

Hardwares : Projector and screensr, reference book, sound system
Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive

Daftar bacaan
Reading list

1. Balla, A., Silini, A., Cherif-Silini, H., Chenari B., A., Moser, W. K., Nowakowska, J. A., & Belbahri, L. (2021). The threat of pests and

	pathogens and the potential for biological control in forest ecosystems. *Forests*, *12*(11), 1579. 2. Cheppy Wati, Arsi, Tili Karenina, Riyanto, Yogi Nirwanto, Intan Nurcahya, Dewi Melani, Dwi Astuti, Dewi Septiarini, Sri Rezeki Fransiska Purba, Evan Purnama Ramdan. Dwiwiyati Nurul. 2021. Hama dan Penyakit Tanaman. Yayasan Kita Menulis. 246 halaman. 3. Gougherty, A. V., & Davies, T. J. (2021). Towards a phylogenetic ecology of plant pests and pathogens. *Philosophical Transactions of the Royal Society B*, *376*(1837), 20200359. 4. Savary, S., Willocquet, L., Pethybridge, S. J., Esker, P., McRoberts, N., & Nelson, A. (2019). The global burden of pathogens and pests on major food crops. *Nature ecology & evolution*, *3*(3), 430-439.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Fisiologi Tanaman *Plant Physiology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191109 *PG191109*
Kursus (jika ada) ***Course (if applicable)***	Fisiologi Tanaman *Plant Physiology*
Semester ***Semester***	III (Tiga) *3rd (Third)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Ramdan Hidayat,.M.S.
Pengajar ***Lecturer***	1. Dr. Ir. Ramdan Hidayat, M.S. 2. Dr. Ir. Nora Augustien, M.P. 3. Dr. Dra. Sutini, M.Pd. 4. Puji Lestari Tarigan, S.P., M.Sc 5. Fadila Suryandika, S.TP., M.Sc.
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*

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Requirements according to theexamination regulations</td><td colspan="2">Mahasiswa harus menghadiri 75% perkuliahan
Students must attend 75% of lectures</td></tr>
<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td colspan="2">-</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mahasiswa mampu mengidentifikasi proses fisiologis yang terjadi pada tumbuhan
Mahasiswa mampu memecahkan permasalahan pertanian terkait penerapan fisiologi tanaman di lapangan.
Mahasiswa menunjukkan sikap sesuai dengan etika akademik dalam kehidupan sehari-hari.

Students capable to identify physiological processes that occur in plants
Students capable to solve agricultural problems related to the application of plant physiology in the field.
Students show attitudes in accordance with academic ethics in everyday life.</td><td>CPL-4

CPL-5

CPL-2

PLO-4

PLO-5

PLO-2</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Mata kuliah ini ditujukan agar mahasiswa memahami dan mampu menafsirkan proses-proses kehidupan pada tumbuhan untuk menghasilkan produksi yang optimal dengan mempelajari proses-proses yang terjadi pada organel, sel, jaringan, dan organ tumbuhan serta faktor-faktor yang mempengaruhinya.

This course is intended for students to understand and be able to interpret the life processes in plants to produce optimum production by studying the processes that occur in organelles, cells, tissues, and plant organs and the factors that influence them.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td colspan="2">Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
● Middle Exam 25%
● Structured Tasks 20%
● Quiz 20%

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</table>

Media yang digunakan ***Media employed***	Projector and screens, Zoom application, E-Learning UPN, e-book, WA Group, GDrive, E-book, WA Group.
Daftar bacaan ***Reading list***	1. Kapoor, D., Bhardwaj, S., Landi, M., Sharma, A., Ramakrishnan, M., & Sharma, A. (2020). The impact of drought in plant metabolism: How to exploit tolerance mechanisms to increase crop production. *Applied Sciences*, *10*(16), 5692. 2. Kaur, A., & Kaur, R. 2022. Effect of different nitrogen levels on growth, yield, quality and nutrient uptake in malt barley (*Hordeum vulgare* L.): A review. *Pharma Innovation*, *11*(7), 2467-2475. 3. Sharma, A., Kumar, V., Shahzad, B. *et al.* Photosynthetic Response of Plants Under Different Abiotic Stresses: A Review. *J Plant Growth Regul* **39**, 509–531 (2020). 4. Qaderi MM, Martel AB, Dixon SL. Environmental Factors Influence Plant Vascular System and Water Regulation. *Plants*. 2019; 8(3):65.

SEMESTER 4

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Kepemimpinan *Leadership*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UV191108 *UV191108*
Kursus (jika ada) ***Course (if applicable)***	Kepemimpinan *Leadership*
Semester ***Semester***	IV (Empat) *4th (Fourth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ertien Rining Nawangsari, M.Si.
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	Learning methods: lectures, discussions, assignments, case study
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*
Prasyarat wajib ***Mandatory prerequisites***	-

<table>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mahasiswa mampu memahami Teori dan konsep Kepemimpinan
Mahasiswa mampu menjalankan karakter kepemimpinan yang Mandiri, Kreatif dan Inovatif sesuai bidang keahliannya.
Mahasiswa mampu melakukan komunikasi, menyusun tim kerja, mengambil keputusan dan evaluasi kegiatan dengan konsep kepemimpinan

Students capable of understanding Leadership theories and concepts.
Students are capable of carrying out independent, creative, and innovative leadership characters according to their field of expertise.
Students are capable of communicating, organizing work teams, making decisions, and evaluating activities with the concept of leadership.</td><td>CPL-2
CPL-2
CPL-2

PLO-2
PLO-2
PLO-2</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Mata kuliah ini membantu para mahasiswa untuk mengeksplorasi potensi kemampuan kepemimpinan berkelompok maupun secara individual sekaligus mendemonstrasikannya. Para mahasiswa akan mempelajari berbagai konsep dan teori kepemimpinan, serta bermacam - macam pendekatan dalam pengembangan kepemimpinan secara personal maupun grup.

This course helps students to explore the potential of group and individual leadership abilities while demonstrating them. Students will study various leadership concepts and theories, as well as various approaches to personal and group leadership development.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td colspan="2">Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
● Middle Exam 25%
● Structured Tasks 20%
● Quiz 20%

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</table></td></tr>
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Media yang digunakan ***Media employed***	Projector and screens, Zoom application, E-Learning UPN, e-book, WA Group
Daftar bacaan ***Reading list***	1. Asep Solikin, H.M Fatchurahman, Supardi. 2017. Pemimpin yang Melayani Dalam Membangun Bangsa Yang Mandiri. Anterior Jurnal, 16(2), 90-103. 2. Sari, Y. K. (2020). Kepemimpinan Pendidikan. 3.Sobry Sutikno. Pemimpin dan Kepemimpinan. 2018. Lombok: Holistica. 4. Syamsu Q. Badu & Novianty Djafri. 2017. Kepemimpinan dan Perilaku Organisasi. Gorontalo: Ideas Publishing.

	**COURSE MODULE** **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Kewirausahaan *Entrepreneurship*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	UV141114 *UV141114*
Kursus (jika ada) ***Course (if applicable)***	Kewirausahaan *Entrepreneurship*
Semester ***Semester***	IV (Empat) *4th (Fourth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr.Ir. Srie Mulijani, MT
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Mata Kuliah Umum Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: General Course* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Practice 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per minggu*

Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu mengkomunikasikan ide, masalah dan solusi yang berkaitan secara ilmiah secara efektif melalui lisan dan tulisan di tingkat lokal, nasional atau internasional Mahasiswa mampu berpikir indikatif, kreatif dan kritis. Mahasiswa mampu mengenali kebutuhan dan mempraktikkan pembelajaran mandiri dan seumur hidup dalam konteks perubahan teknologi dan sosial yang luas. Mahasiswa mampu merancang sistem, komponen atau proses sesuai kebutuhan dalam batasan realistis meliputi aspek ekonomi, lingkungan, sosial, politik, etika, kesehatan dan keselamatan, kelayakan produksi dan keberlanjutan dengan mempertimbangkan kemajuan di bidang agroteknologi. *Student capable to communicate scientifically related ideas, problems and solutions effectively through oral and written at local, national or international levels* *Student capable to think indicatively, creatively and critically.* *Student capable to recognize needs and practice independent and lifelong learning in the context of broad technological and social change.* *Student capable to design a system, component or process according to needs within realistic constraints including economic, environmental, social, political, ethical, health and safety, production feasibility and sustainability aspects using considerations of progress in the field of agrotechnology.*	CPL-1 CPL-2 CPL-3 *PLO-1* *PLO-2* *PLO-3*
Isi ***Content***	Mata kuliah ini membahas tentang kebutuhan wirausaha baru di Indonesia, pengertian dan tujuan berwirausaha, motivasi mencapai impian, kelebihan dan kekurangan berwirausaha, langkah-langkah memulai wirausaha, karakter wirausaha dan motivasi berwirausaha, kepemimpinan, strategi pemasaran, jenis-jenis badan usaha. serta inovasi dan risiko bagi pengembangan bisnis. *This course discuss about needs of new entrepreneurs in Indonesia, meaning and goals of entrepreneurship, motivation to achieve dreams, advantages and disadvantages of entrepreneurship, steps to starting an entrepreneur, entrepreneurial character and motivation*	

<table>
<tr><td></td><td>for entrepreneurship, leadership, marketing strategy, types of business entities and the innovation and risk for business development.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
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Reading list</td><td>1. Andrew Barkley and Paul W. Barkley. 2013. Principles of Agricultural Economics. USA: Routledge.
2. Hidayat, A. 2023. Analisis ekonomi pertanian dalam mengukur keberlanjutan dan profitabilitas usaha tani.
3. Azis, H. M. B.A., M. M., Didi Suardi, L., & Ek, M. A. 2020. Pengantar Ekonomi Islam. Jakad Media Publishing.
4. Martiin, Carin. 2013. The World of Agricultural Economics. New York: Routledge.
5. Penson John, Capps Oral, Rosson C. Par, Woodward Richard T. 2015. Introduction to Agricultural Economics. England: Pearson Education Limited.
6. Schmitz Andrew, P Khrisna, Paudel, Cramer Gail. 2018. The Routledge Handbook of Agricultural Economics. New York: Routledge.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Produksi Tanaman Pangan dan Perkebunan *Staple and Industrial Crop Production Technology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191105 *PG191105*
Kursus (jika ada) ***Course (if applicable)***	Teknologi Produksi Tanaman Pangan dan Perkebunan *Staple and Industrial Crop Production Technology*
Semester ***Semester***	IV (Empat) *4th (Fourth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Ir. Agus Sulistyono, MP
Pengajar ***Lecturer***	1. Ir. Agus Sulistyono, MP 2. Ir. Djarwatiningsih PS, MP 3. Ir. Hadi Suhardjono, M.Tp 4. Fadila Suryandika, STP, M.Sc
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit	3 SKS *3 credits or 4.8 ETCS*

Credit point		
Persyaratan sesuai ketentuan ujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu memahami secara mandiri teknologi produksi tanaman pangan dan perkebunan, syarat tumbuh dan tahapan budidayanya. Mahasiswa mampu merumuskan permasalahan mengenai teknologi produksi tanaman pangan dan perkebunan. Mahasiswa mampu mendemonstrasikan penerapan teknologi produksi tanaman pangan dan perkebunan. *Students capable to independently understand the production technology of food and plantation crops, their growing requirements and cultivation stages.* *Students capable to formulate problems regarding production technology of food crops and plantations.* *Students capable to demonstrate the application of food and plantation crop production technology.*	CPL- 2, CPL-4 CPL-2, CPL-5 CPL-2, CPL-8 *PLO 2, PLO 4* *PLO 2, PLO 5* *PLO 2, PLO 8*
Isi ***Content***	Mata kuliah Teknologi Produksi Tanaman Pangan dan Perkebunan dimaksudkan untuk membekali mahasiswa dengan kemampuan menguasai konsep dan teori teknologi di bidang pertanian dan budidaya tanaman berbasis komoditas secara mandiri maupun bekerjasama serta memiliki kepedulian terhadap masyarakat dan lingkungan. Mata kuliah ini terdiri dari 2 SKS kuliah dan 1 SKS praktikum. Meliputi materi pemahaman teknologi produksi tanaman pangan dan perkebunan, upaya peningkatan produksi, budi daya padi, jagung, singkong, kedelai, ubi jalar, kacang tanah/kacang hijau, kelapa sawit, kakao, cengkeh, karet, kopi, teh, tebu. *Staple and Industrial Crop Production Technology course is intended to provide students with the ability to master the concepts and theories of technology in agriculture and commodity-based crop cultivation independently or in collaboration and have concern for society and the environment. This course consists of 2 credits of lecture and 1 credit of practicum. Includes material on the understanding of production technology of food crops and plantations, efforts to increase production, cultivation of rice, corn, cassava, soybeans, sweet potatoes, peanuts/green beans, oil palm, cocoa, cloves, rubber, coffee, tea, sugar cane.*	
Persyaratan belajar dan ujian serta bentuk ujian	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30%	

<table>
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Middle Exam 20%
Structured Tasks 30%
Practicum 20%

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MacLaren, C., Storkey, J., Menegat, A., Metcalfe, H., & Dehnen-Schmutz, K. 2020. An ecological future for weed science to sustain crop production and the environment. A review. Agronomy for Sustainable Development, 40, 1-29.
Trubus Cipta Usaha. 2016. How to be the King of Cassava. Trubus Cipta Usaha. 128 pp.
Sunarko. 2014. Oil Palm Cultivation in Various Land Types. Agromedia Pustaka. Jakarta. 200 pp.
Raharjo, P. 2017. Coffee Gardening. Penebar Swadaya. Jakarta. 116 pp.
Zhichkin, K., Nosov, V., Zhichkina, L., Dibrova, Z., & Cherepova, T. 2019. Development of evaluation model effectiveness of modern technologies in crop production. In IOP Conference Series: Earth and Environmental Science (Vol. 315, No. 2, p. 022023). IOP Publishing.

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	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Penginderaan Jauh & Sistem Informasi Geografis *Remote Sensing Technology & Geographic Information Systems*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	MKK 3302 *MKK 3302*
Kursus (jika ada) ***Course (if applicable)***	Sistem Informasi Geografis *Geographic Information System*
Semester ***Semester***	IV (Empat) *4th (Fourth)*
Penanggung Jawab Modul ***Person Responsible for theModule***	Ir. Siswanto, M.T.
Pengajar **Lecturer**	Ir. Kemal Wijaya, M.T. Dr. Ir. Purnomo Edi Sasongko, M.P.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Copulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja **Work load**	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per minggu*

Angka kredit ***Credit point***	3 kredit (sks) *3 credit points or. 4.8 ECTS*	
Persyaratan sesuai ketentuanujian **Requirements according to the examination regulations**	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib **Mandatory prerequisites**	FP-191107 Dasar Ilmu Tanah *Fundamentals of Soil Science*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa memiliki keyakinan untuk menggunakan alat SIG dan penginderaan jauh Mahasiswa mampu menuangkan konsep SIG dan PJ untukmenyelesaikan tugas secara mandiri Mahasiswa mampu menggunakan SIG untuk mengekstrakdan analisis dasar data PJ Mahasiswa trampil mengaplikasikan SIG untuk menyelesaikan problematika lahan dan lingkungannya Mahasiswa memiliki kemampuan untuk menyajikan data proses Mahasiswa memiliki kemampuan melakukan analisis data lahan dan lingkungan *Students have the confidence to use GIS and remote sensing tools* *Students are able to express GIS and PJ concepts to complete assignments independently* *Students are able to use GIS to extract and base PJ data analysis* *Students are skilled at applying GIS to solve land and environmental problems* *Students have the ability to present data processes* *Students have the ability to analyze land and environmental data*	CPL-4 CPL-4 CPL-5 CPL-5 CPL-5 CPL-5 *PLO-4* *PLO-4* *PLO-5* *PLO-5* *PLO-5* *PLO-5*
Isi ***Content***	Mata kuliah ini membahas tentang Sistem Informasi Geografis dan pemanfaatan alat penginderaan jauh, penerapan GIS untuk menyelesaikan permasalahan lahan dan lingkungan, pemanfaatan data, hingga analisis kondisi lahan dan lingkungan. *This course is about Geographical Information System and use remote sensing tools,apply GIS to solve land and environmental problems, use the data o analyze land and environmental conditions.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Learning methods: lectures, discussions, assignments (review, case study) Exam requirements: Minimum 75% attendance to take the final exam Question Form: True-False, Multiple Choice, and Essay or Assignment ● Final Score Components: ● Final Exam 35% ● Middle Exam 25% ● Structured Tasks 20% ● Quiz 20%	

Final Score	Letter	Number Quality	Final Score	Letter	Number Quality

	≥ 80 – 100	A	4.00	≥ 58 – <64	C+	2.50
	≥ 76 – <80	A^{-}	3.75	≥ 54 – <58	C	2.00
	≥ 72 – <76	B+	3.50	≥ 50 – <54	C-	1.75
	≥ 68 – <72	B	3.00	≥ 46 –<50	D+	1.50
	≥ 64 – <68	B^{-}	2.75	≥ 42 – <46	D	1.00
				0 - < 42	E	0.00

Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive
Daftar bacaan ***Reading list***	1. Abasxanova, X. Y. (2022). The role of geographic information system in growing agricultural production. Universum. 2. Khoirunnisa, L., Kurniawan, F., & Artikel, H. (2019). Sistem Informasi Geografis Pemetaan Komoditas Pertanian dan Informasi Iklim Berbasis Slim Framework. Sains, Aplikasi, Komputasi dan Teknologi Informasi, 1(1), 16. 3. Pradana, A. S. P. (2019). Sistem Informasi Geografis Penggunaan Lahan Dan Produksi Tanaman Pangan Kabupaten Kediri Jawa Timur. JATI (Jurnal Mahasiswa Teknik Informatika), 3(2), 9-15. 4. Supriyono, S., & Maharani, F. F. (2020). Analisis Kebutuhan Sistem Informasi Geografis Lahan Pertanian Sayuran dan Buah-buahan di Kota Batu. MATICS: Jurnal Ilmu Komputer dan Teknologi Informasi (Journal of Computer Science and Information Technology), 12(1), 44-48.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Benih *Seed Technology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG141119 *PG141119*
Kursus (jika ada) ***Course (if applicable)***	Teknologi Benih *Seed Technology*
Semester ***Semester***	IV (Empat) *4th (Fourth)*
Penanggung Jawab Modul ***Person Responsible for theModule***	Dr. Ir. Ida Retno M., M.P.
Pengajar ***Lecturer***	Dr. Ir. Ida Retno M., M.P. Prof. Dr. Ir. Juli Santoso P., M.P. Ir. Djarwatiningsih P., M.P. Nova Triani, S.P., M.P.
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per minggu*

Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu memahami konsep teknologi dan produksi benih untuk kebutuhan benih di bidang pertanian. Mahasiswa mampu merancang teknologi produksi benih, mulai dari penanganan benih pasca panen, distribusi, dan sertifikasi benih. Mahasiswa mampu merancang produksi benih yang berkualitas dan bersertifikat. Mahasiswa mampu menghasilkan benih dan mendemonstrasikannya. *Students capable to understand the concept of technology and seed production for seed requirements in agriculture.* *Students are capable of designing seed production technology, from post-harvest seed handling, distribution, and seed certification.* *Students are capable of designing the production of high-quality and certified seeds.* *Students capable to produce seeds and demonstrate it.*	CPL-5 CPL-8 CPL-12 CPL-12 *PLO-5* *PLO 8* *PLO 12* *PLO 12*
Isi ***Content***	Mata kuliah ini memberikan pemahaman dan kemampuan kepada mahasiswa mengenai teknologi produksi benih berdasarkan pembahasan mengenai: Nomenklatur benih (pengertian ilmu dan teknologi benih, permasalahan benih, dan definisi benih); Biologi Benih 1 (struktur dan fungsi benih, klasifikasi benih ortodoks dan bandel). Biologi Benih 2 (proses perkecambahan dan dormansi benih); Produksi benih generatif (proses penyerbukan, pemupukan, perkembangan benih, konsep ketidakcocokan, benih komposit, benih hibrida); Kesehatan Benih; Pemanenan dan pengolahan benih; Pengemasan dan penyimpanan benih; Penurunan kualitas benih dan priming benih; pengujian mutu benih, sertifikasi, dan pemasaran benih; Produsen benih. *This course provides understanding and capabilities to students on seed production technology based on discussions of: Seed nomenclature (definition of seed science and technology, seed issues, and seed definition); Seed Biology 1 (seed structure and functions, classification of orthodox and recalcitrant seeds). Seed Biology 2 (germination processes and seed dormancy); Generative seed production (pollination process, fertilization, seed development, incompatibility concepts, composite seeds, hybrid seeds); Seed Health; Harvesting and seed processing; Seed packaging and storage; Seed quality deterioration and seed priming; Seed quality testing, certification, and seed marketing; Seed producers.*	

<table>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

<table><tr><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th></tr><tr><td>≥ 80 – 100</td><td>A</td><td>4.00</td><td>≥ 58 – <64</td><td>C+</td><td>2.50</td></tr><tr><td>≥ 76 – <80</td><td>A-</td><td>3.75</td><td>≥ 54 – <58</td><td>C</td><td>2.00</td></tr><tr><td>≥ 72 – <76</td><td>B+</td><td>3.50</td><td>≥ 50 – <54</td><td>C-</td><td>1.75</td></tr><tr><td>≥ 68 – <72</td><td>B</td><td>3.00</td><td>≥ 46 –<50</td><td>D+</td><td>1.50</td></tr><tr><td>≥ 64 – <68</td><td>B-</td><td>2.75</td><td>≥ 42 – <46</td><td>D</td><td>1.00</td></tr><tr><td></td><td></td><td></td><td>0 - < 42</td><td>E</td><td>0.00</td></tr></table></td></tr>
<tr><td>Media yang digunakan
Media employed</td><td>Projector and screens, Zoom application, E-Learning UPN, e-book, WA Group</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>1. Agustiansyah, A., Ilyas, S., Sudarsono, S., & Machmud, M. (2020). Pengaruh perlakuan benih dengan agens hayati dan pemupukan terhadap pertumbuhan tanaman, produksi dan mutu benih padi di lapang. Jurnal Agrotropika, 17(2).
2. Gough, R. E. (2020). Seed quality: basic mechanisms and agricultural implications. CRC Press.
3. Sudrajat, D.J., Nurhasybi dan Y.Bramasto. 2017. Standar Pengujian dan Mutu Benih Tanaman Hutan. IPB Press. Bogor.
4. Harjadi, S.S. 2019. Dasar-Dasar Agronomi. Gramedia Pustaka Utama. Jakarta.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Kesuburan Tanah *Soil Fertility Technology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191113 *PG 191113*
Kursus (jika ada) ***Course (if applicable)***	Kesuburan Tanah *Soil Fertility*
Semester ***Semester***	IV (Empat) *4th (Fourth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Wanti Mindari, MP.
Pengajar ***Lecturer***	Dr. Ir. Wanti Mindari, MP. Dr. Ir. Rossyda Priyadarshini, MP., Dr. Ir. Bakti Wisnu Widjajani, MP., Fitri Wijayanti, SP., MP. Haidar Fari Aditya., SP., MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: ILmu Tanah Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per minggu*

<table>
<tr><td>Angka kredit
Credit point</td><td colspan="2">3 SKS
3 credits or 4.8 ETCS</td></tr>
<tr><td>Persyaratan sesuai ketentuanujian
Requirements according to theexamination regulations</td><td colspan="2">Mahasiswa harus menghadiri 75% perkuliahan
Students must attend 75% of lectures</td></tr>
<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td colspan="2">Dasar Ilmu Tanah
Basic of Soil Science</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mahasiswa mampu memahami tingkat kesuburan tanah
Mahasiswa sifat-sifat tanah dan fungsinya bagi tanaman
Mahasiswa mampu menjelaskan kesuburan tanah tanah marginal
Mahasiswa mampu mendiagnosa dan analisis ciri tanah dan gejala defisiensi dan keracunan tanaman

Students are able to understand the level of soil fertility
Students of the properties of soil and its function for plants
Students are able to explain the soil fertility of marginal land
Students are able to diagnose and analyze soil characteristics and symptoms of plant deficiencies and poisoning</td><td>CPL-4
CPL-4
CPL-4

CPL-10

PLO-4
PLO-4

PLO-4

PLO-10</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Mata kuliah ini mempelajari mengenai konsep kesuburan tanah, sifat-sifat tanah an fungsinya bagi pertumbuhan tanaman, kesuburan tanah tanah marginal (masam, alkalin, lahan kering dan lahan basah, diagnosis dan analisis ciri tanah dan gejala defisiensi dan keracunan tanaman.

This course studies the concept of soil fertility, soil properties and functions for plant growth, marginal soil fertility (acid, alkaline, dry land and wet land), diagnosis and analysis of soil characteristics and symptoms of plant deficiencies and poisoning.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td colspan="2">Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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</table></td></tr>
<tr><td>Media yang digunakan
Media employed</td><td colspan="2">Projector and screens, Zoom application, E-Learning UPN, e-book, WA Group</td></tr>
</table>

Daftar bacaan ***Reading list***	1. Asril, M., Ningsih, H., Basuki, B., Suhastyo, A. A., Septyani, I. A. P., Abidin, Z., ... & Tang, J. (2023). Kesuburan dan Pemupukan Tanah. 2. Handayanto, E., Muddarisna, N., & Fiqri, A. (2017). *Pengelolaan Kesuburan Tanah*. Universitas Brawijaya Press. 3. Mindari, Wanti., Bakti Wisnu W., dan Rossyda, P. (2018). Kesuburan Tanah dan Pupuk.Yogyakarta: Gosyen Publishin. 4. Pahalvi, H. N., Rafiya, L., Rashid, S., Nisar, B., & Kamili, A. N. (2021). Chemical fertilizers and their impact on soil health. *Microbiota and Biofertilizers, Vol 2: Ecofriendly Tools for Reclamation of Degraded Soil Environs*, 1-20. 5. Srivastava, A. K., Wu, Q. S., Mousavi, S. M., & Hota, D. (2021). Integrated soil fertility management in fruit crops: An overview. *International Journal of Fruit Science*, *21*(1), 413-439.

COURSE MODULE
AGROTECHNOLOGY STUDY PROGRAM
FACULTY OF AGRICULTURE
UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR

Nama Modul ***Module name***	Manajemen Organisme Pengganggu Tumbuhan Terpadu (MOPTT) *Integrated Plant Pest and Disease Management*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191114 *PG191114*
Kursus (jika ada) ***Course (if applicable)***	Manajemen Organisme Pengganggu Tumbuhan Terpadu (MOPTT) *Integrated Plant Pest and Disease Management*
Semester ***Semester***	IV (Empat) *4th (Fourth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Sri Wiyatiningsih, MP.
Pengajar ***Lecturer***	1. Dr. Ir. Sri Wiyatiningsih., M.P. 2. Dr. Ir. Herry Nirwanto., M.P. 3. Dr. Ir. Wiwin Windriyanti., M.P. 4. Dr. Ir. yenny Wuryandari., M.P. 5. Noni Rahmadhini., S.P., M.P. 6. Dita megasari., S.P., M.P. 7. Ramadhani Mahendra Kusuma., S.P., M.P. 8. Safira Rizka Lestari., S.P., M.P.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu

	Case study : 1 x 50 = 50 minutes per minggu Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per minggu*	
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Dasar Perlindungan Tanaman *Basic of Plant Protection*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menerapkan pengetahuan ilmu tanaman dan konsep dasar ilmu hama dan penyakit tanaman, serta konsep perlindungan tanaman terhadap hama penyakit secara terpadu. *The individual possesses the capacity to effectively utilize their comprehension of Plant Science and fundamental principles of Plant Production, Soil and Land resources, as well as the concept of Plant pests and Plant protection against pests and diseases in a cohesive and comprehensive manner.*	CPL-4 PLO-4
Isi ***Content***	Pendahuluan berupa pengantar materi kuliah, uraian tentang perjalanan sejarah perlindungan tanaman sampai lahirnya konsepsi MOPTT, dasar ekologi dalam MOPTT, permasalahan dan konsep MOPTT, piramida taktik dalam MOPTT, strategi dalam MOPTT, kemampuan analitik MOPT berbasis aspek ekologik, ekonomik dan sosial, mengikuti perkembangan MOPTT untuk mendukung sistem pertanian berlanjut. *The introduction is to introduce lecture material, description of the historical journey of plant protection until the birth of the MOPTT conception, Ecological basis in MOPTT, Problems and concepts of MOPTT, Pyramid of Tactics in MOPTT, Strategy in MOPTT, Analytical ability of MOPTT based on ecological, economic and social aspects, Following the development of MOPTT to support sustainable farming systems.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%	

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Media yang digunakan ***Media employed***	Projector and screens, Zoom application, E-Learning UPN, e-book, WA Group
Daftar bacaan ***Reading list***	1. David W Onstad, Philip Crain. 2020. The Economics of Integrated Pest Management of Insects. CABI. 232 pages 2. Rosemary Collier. 2022. Improving integrated pest management in horticulture. Burleigh Dodds Science Publishing. Sawston. 464 pages. 3. Devendra Pal Singh. 2023. Integrated Pest Management in Diverse Cropping Systems. CRC Press/Apple Academic Press. Palm Bay. 579 pages 4. Cocuzza, Giuseppe E. Massimino; Rapisarda, Carmelo. 2018. Integrated pest management in tropical regions. CABI. 352 pages 5. Wiyatiningsih, S., Wibowo, A., & Triwahyu, E. 2016. Vegetative Compatibility Group in Pathogenic Isolates of *Fusarium oxysporum* f.sp. *cepae* Causing Twisting Disease in Shallot. Philippine Journal of Crop Science. 41(1):36-40.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Bioteknologi Pertanian *Agricultural Biotechnology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191115 *PG191115*
Kursus (jika ada) ***Course (if applicable)***	Bioteknologi Pertanian *Plant Biotechnology*
Semester ***Semester***	IV (Empat) *4th (Fourth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Makhziah, MP.
Pengajar ***Lecturer***	1. Dr.Ir. Sukendah, MSc. 2. Dr.Ir. Makhziah, MP 3. Dr. Ir. Pangesti Nugrahani, MSi. 4. Nova Triani, SP.MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomy Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per minggu*

Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa menunjukkan sikap bertanggungjawab atas pekerjaan di bidang keahliannya secara mandiri Mahasiswa mampu memelihara dan mengembangkan jejaring kerja secara kolaboratif dengan pembimbing, kolega, sejawat baik di dalam maupun di luar lembaganya Mahasiswa mampu menerapkan pengetahuan Ilmu Tanaman dan konsep dasar Produksi Tanaman, Tanah dan konsep dasar Sumber dan daya lahan, konsep perlindungan tanaman terhadap hama Penyakit secara terpadu Mahasiswa mampu menguasai prinsip-prinsip penerapan teknologi pertanian *Student capable to think critically and analytically, solve problems, be responsible for work independently, and make appropriate decisions based on information that can be accounted* *Student capable to maintain and develop collaborative networks with mentors, colleagues, both inside and outside their respective workplace* *Student capable to apply the knowledge of plant Science, the basic concepts of plant production, land resources and soil science, and integrated concept of plant protection against of pests and diseases* *Student capable to apply the principles of agricultural technology to solve agricultural problems*	CPL-2 CPL-3 CPL-3 CPL-5 *PLO-2* *PLO-3* *PLO-4* *PLO-5*
Isi ***Content***	*Basic concepts and developments in industrial biotechnology, in vitro techniques, explant regeneration through organogenesis and somatic embryogenesis, somaclonal variation for agricultural product development, basic principles of genetic engineering in problem solving, recombinant DNA techniques and gene transformation for agricultural products, genetic markers and its applications, ethics and regulation of biosafety of genetically engineered products, management of plant biotechnology laboratories in commercial product development, basic principles of technopreneurship and strategic planning for businesses in plant biotechnology*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%	

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Media yang digunakan ***Media employed***	Projector and screens, Zoom application, E-Learning UPN, e-book, WA Group
Daftar bacaan ***Reading list***	1. Dong, O. X., & Ronald, P. C. (2019). Genetic engineering for disease resistance in plants: recent progress and future perspectives. *Plant physiology*, *180*(1), 26-38. 2. Kim, H. S., & Kwak, S. S. (2020). Crop biotechnology for sustainable agriculture in the face of climate crisis. *Plant Biotechnology Reports*, *14*, 139-141. 3. Nuccio, M. L., Paul, M., Bate, N. J., Cohn, J., & Cutler, S. R. (2018). Where are the drought tolerant crops? An assessment of more than two decades of plant biotechnology effort in crop improvement. *Plant science*, *273*, 110-119.

SEMESTER 5

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Agroforestri *Agroforestry*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191117 *PG191117*
Kursus (jika ada) ***Course (if applicable)***	Agroforestri *Agroforestry*
Semester ***Semester***	V (Lima) *5th (Fifth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Rossyida Priyadarshini, MP
Pengajar ***Lecturer***	1. Dr. Ir. Rossyida Priyadarshini, MP 2. Dr. Ir. Bakti Wisnu Widjajani, MP. 3. Dr. Ir. Penta Suryaminarsih, MP. 4. Fitri Wijayanti, SP., MP. 5. Safira Riska Lestari, SP., MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu*
Angka kredit ***Credit point***	2 SKS *2 credits point or 3.2 ETCS*
Persyaratan sesuai ketentuanujian	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Requirements according to theexamination regulations		
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and theircorresponding PLOs***	Mahasiswa mampu menjelaskan konsep dan prinsip agroforestri yang mengacu pada prinsip pertanian berkelanjutan, dan berlandaskan kearifan lokal	CPL-4
	Mahasiswa mampu mengelola dan mengembangkan lahan marginal melalui penerapan konsep agroforestri yang tepat untuk mendapatkan lahan yang sehat dan produktif	CPL-4
	Mahasiswa mampu merencanakan dan merancang konsep agroforestri pada setiap jenis penggunaan lahan untuk mempertahankan dan meningkatkan produktivitas lahan	CPL-7
	Mahasiswa mampu mendeskripsikan peran dan fungsi agroforestri dalam siklus unsur hara dan air; siklus karbon, serta perannya dalam mengendalikan hama dan penyakit	CPL-7
	Mahasiswa mampu memahami interaksi komponen agroforestri terhadap proses yang terpengaruh, dan menggunakan pengetahuan ini untuk merencanakan, merancang, dan mengelola lahan tidak lestari dan lahan tidak produktif.	CPL-9
	Student capable to explain the concept and principle of agroforestry which refers to sustainable agriculture principles, and is based on the local wisdom	*PLO-4*
	Student capable in managing and developing marginal land through implementing appropriate agroforestry concepts to get the healthy and productive land	*PLO-4*
	Student capable to plan, and design the agroforestry concept on each type of land use to maintain and increase the productive land	*PLO-7*
	Student capable to describe the role and function of agroforestry in the nutrient and water cycle; carbon cycle, as well as their role in controlling pest and disease	*PLO-7*
	Student capable in understanding the interaction of agroforestry components the processes affected, and use this knowledge to plan, design, and manage the unsustainable land unproductive land.	*PLO-9*
Isi ***Content***	Agroforestri merupakan bagian dari ilmu pertanian dan kehutanan yang telah lama dipraktikkan oleh para petani. Secara sederhana Agroforestri berarti penanaman pohon pada lahan pertanian dengan petani atau masyarakat sebagai unsur (subyek) utamanya. Kajian agroforestri tidak hanya terfokus pada permasalahan teknis dan biofisik saja namun juga permasalahan sosial, ekonomi, dan budaya yang selalu berubah dari waktu ke waktu, sehingga agroforestri merupakan salah satu cabang ilmu yang dinamis dalam konteks pembangunan pertanian berkelanjutan. *Agroforestry is a part of science in agriculture and forestry and has been practiced by farmers for a long time. In simple terms, Agroforestry means planting trees on agricultural land, with farmers or the community as the*	

<table>
<tr><td></td><td>main element (subjects). Agroforestry studies do not only focus on technical and biophysical issues but also social, economic, and cultural issues that are always changing from time to time, so that agroforestry is a dynamic branch of science in the context of sustainable agricultural development.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>1. Kusumawati, I. A., Mardiani, M. O., Purnamasari, E., Batoro, J., Van Noordwijk, M., & Hairiah, K. (2022). Agrobiodiversity and plant use categories in coffee-based agroforestry in East Java, Indonesia. Biodiversitas Journal of Biological Diversity, 23(10).
2. Octavia, D., Suharti, S., Murniati, Dharmawan, I. W. S., Nugroho, H. Y. S. H., Supriyanto, B., ... & Ekawati, S. (2022). Mainstreaming smart agroforestry for social forestry implementation to support sustainable development goals in Indonesia: A review. Sustainability, 14(15), 9313.
3. Susanto, A., Winarni, M., Abdullah, M. N., & Briggs, D. (2021). Environmental Contribution of Community Forests For Food Production With Agroforestry Patterns. International Journal of Science and Environment (IJSE), 1(1), 15-21.
4. Udawatta, R. P., Rankoth, L. M., & Jose, S. (2021). Agroforestry for biodiversity conservation. Agroforestry and ecosystem services, 245-274.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Pertanian Berkelanjutan *Sustainable AgricultureTechnology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191119 *PG191119*
Kursus (jika ada) ***Course (if applicable)***	Sistem Pertanian Berkelanjutan *Sustainable Agriculture System*
Semester ***Semester***	V (Lima) *5th (Fifth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Nora Augustien K, MP
Pengajar ***Lecturer***	1. Dr. Ir. Nora Augustine K, MP 2. Dr. F Deru Dewanti, SP, MP 3. Dr. Ir. Maroeta, MP 4. Dr. Ir. Sri Wiyatiningsih, MP
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Pertanian Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Agriculture* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per minggu*

Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ECTS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan seluruh konsep tentang pertanian berkelanjutan; sifat budidaya menuju pertanian berkelanjutan yang memahami sumber bahan organik. Mahasiswa mampu memahami dan menjelaskan proses pertanian berkelanjutan menuju kondisi lahan berkelanjutan secara terpadu. Mahasiswa mampu memahami dan menjelaskan parameter-parameter pendukung pertanian berkelanjutan dari aspek biofisik lingkungan dan tanaman. Mahasiswa mampu memahami dan menjelaskan tentang pertanian berkelanjutan secara terpadu baik dari aspek sosial, ekonomi, dan biofisik. *Students capable to explain all concepts about sustainable agriculture; the nature of cultivation towards sustainable agriculture that understands the sources of organic materials.* *Students capable to understand and explain the process of sustainable agriculture towards sustainable land conditions in an integrated manner.* *Students capable to understand and explain the parameters that support sustainable agriculture from the aspects of biophysical environment and plants.* *Students capable to understand and explain about sustainable agriculture in an integrated manner both from social, economic and biophysical aspects.*	CPL-4 CPL-7 CPL-7 CPL-2 *PLO 4* *PLO 7* *PLO 7* *PLO 2*
Isi ***Content***	(1) Praktik produksi pertanian yang adaptif terhadap perubahan iklim dan mengurangi (mitigatif) kerusakan akibat perubahan iklim, (2) Pengelolaan keanekaragaman hayati dan ekosistem serta penerapan pengelolaan lanskap teknologi, (3) Landasan kelembagaan pertanian tetap berjalan. *This course is divided into three parts, namely: (1) Agricultural production practices that are adaptive to climate change and reduce (mitigative) damage due to climate change, (2) Management of biodiversity and ecosystems and application of landscape management technology, (3) Institutional foundations agriculture continues.*	

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Question Form: Essay or Assignment
Final Score Components:
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● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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<td>Daftar bacaan
Reading list</td>
<td>

Altieri, M. A. (2018). Agroecology: the science of sustainable agriculture. CRC Press.
Dadi, D. (2021). Pembangunan Pertanian dan sistem Pertanian Organik: Bagaimana Proses Serta Strategi Demi Ketahanan Pangan Berkelanjutan Di Indonesia. Jurnal Education and Development, 9(3), 566-572.
Edwards, C. A. (2020). Sustainable agricultural systems. CRC Press.
Puspitasari, R. D. (2020). Pertanian berkelanjutan berbasis revolusi industri 4.0. Jurnal Layanan Masyarakat (Journal of Public Services), 3(1), 26.
Sitti Arwati, S. P. (2018). Pengantar Ilmu Pertanian Berkelanjutan. Penerbit INTI MEDIATAMA.

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

COURSE MODULE
AGROTECHNOLOGY STUDY PROGRAM
FACULTY OF AGRICULTURE
UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR

Nama Modul ***Module name***	Teknologi Pengelolaan Tanah dan Air *Water and Soil Management Technology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191120 *PG 191120*
Kursus (jika ada) ***Course (if applicable)***	Pengelolaan Tanah dan Air *Water and Soil Management*
Semester ***Semester***	V (Lima) *5th (Fifth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Wanti Mindari, MP.
Pengajar ***Lecturer***	Dr. Ir. Wanti Mindari, MP. Dr. Ir. Rossyda Priyadarshini, MP. Dr. Ir. Moch. Arifin, MT.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* 3. Lab Work 100 minutes/meeting (12 meetings)
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per minggu*
Angka kredit ***Credit point***	3 ECTS *3 credits or 4.8 ETCS*

Persyaratan sesuai ketentuanujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Dasar Ilmu Tanah *Introduction of Soil Science*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa menunjukkan sikap bertanggung jawab atas pekerjaan di bidang keahliannya secara mandiri Mahasiswa mampu menguasai prinsip prinsip penerapan teknologi pertanian untuk menyelesaikan permasalahan di bidang pertanian Mahasiswa mampu mengkaji implementasi penerapan system pertanian berkelanjutan yang memperhatikan dan menerapkan kaidah, tata cara dan etika ilmiah dalam rangka menghasilkan solusi, gagasan, dan desain berdasarkan hasil analisis informasi dan data Mahasiswa mampumengidentifikasi, merumuskan, menganalisis dan menyelesaikan permasalahan bidang sumberdaya lahan *Student capable to think critically and analytically, solve problems, be responsible for work independently, and make appropriate decisions based on information that can be accounted* *Student capable to apply the principles of agricultural technology to solve agricultural problems* *Student capable to study the implementation of sustainable agricultural systems that pay attention to and apply scientific principles, procedures and ethics in order to produce solutions, ideas and designs based on the results of information and data analysis* *Student capable to apply knowledge of identifying, formulating, analyzing, planning and applying land resource management.*	CPL-2 CPL-5 CPL-7 CPL-9 *PLO-2* *PLO-5* *PLO-7* *PLO-9*
Isi ***Content***	Materi yang dipelajari meliputi: konsep dan definisi pengelolaan tanah dan air, komponen pengelolaan tanah, Air dalam Tanah, pergerakan air dalam tanah, air dalam tanaman, Suplai air dan pertumbuhan tanaman, Erosi tanah dan pengendaliannya, tanah salin dan tanah sodiq, lahan pasang surut, pengelolaan tanah masam, pengelolaan lahan kering, pengelolaan lahan gambut, serta diskusi terstruktur. *The material studied includes; concepts and definitions of soil and water management, components of soil management, water in soil, movement of water in soil, water in plants, water supply and plant growth, soil erosion and its control, saline soil and sodiq soil, tidal soil, acid soil management, dry land management, peatland management, as well as structured discussions.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%	

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Daftar bacaan ***Reading list***	1. Eni, M. Ã., Annisa, W., & Noor, M. (2016). Teknologi pengelolaan lahan rawa untuk tanaman pangan dan hortikultura dalam konteks adaptasi terhadap perubahan iklim. *Jurnal Sumberdaya Lahan*, *10*(2). 2. Rachman, L. M., Baskoro, D. P. T., Wahjunie, E. D., Nurmilah, A., Astriani, T., & Dewi, N. M. (2019, November). Evaluasi Sifat Fisik Tanah Pengendali Kemampuan Tanah Memegang Air dan Memasok Air Bagi Tanaman serta Kaitannya Dengan Manajemen Pertanian pada Lahan Sub Optimal. In *Seminar Nasional Lahan Suboptimal* (No. 1, pp. 111-120). 3. Wolka, K., Mulder, J., & Biazin, B. (2018). Effects of soil and water conservation techniques on crop yield, runoff and soil loss in Sub-Saharan Africa: A review. *Agricultural water management*, *207*, 67-79. 4. YUNIWATI, E. D. (2017). M*anajemen Tanah:(Teknik Perbaikan Kualitas Tanah)*. Intimedia.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Bakteriologi Pertanian *Agricultural Bacteriology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 141214 *PG 141214*
Kursus (jika ada) ***Course (if applicable)***	Bakteriologi Pertanian *Agricultural Bacteriology*
Semester ***Semester***	V (Lima) *5th (Fifth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Yenny Wuryandari, MP.
Pengajar ***Lecturer***	Dr. Ir. Yenny Wuryandari, MP. Dr. Ir. Arika Purnawati, MP. Dr. Dra. Endang Triwahyu Prasetyawati, MP. Safira Rizka Lestari, SP., MP.
Bahasa ***Language***	Indonesia dan Inggris Indonesian and English
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi:HPT Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per minggu*

Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Mikrobiologi Pertanian *Agricultural Microbiology*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa menunjukkan sikap bertanggungjawab atas pekerjaan di bidang keahliannya secara mandiri Mahasiswa mampu menerapkan pengetahuan Ilmu Tanaman dan konsep dasar produksi tanaman, tanah dan konsep dasar daya lahan, serta HPT dan konsep perlindungan tanaman terhadap Hama Penyakit secara terpadu Mahasiswa mampu mendiagnosa, menganalisis dan menyelesaikan permasalahan hama penyakit tanaman Mahasiswa menguasai Teknologi dan mampu mengkomunikasikan dengan masyarakat dalam menyelesaikan permasalahan pertanian baik lisan maupun tulisan *Student capable to think critically and analytically, solve problems, be responsible for work independently, and make appropriate decisions based on information that can be accounted* *Student capable to apply the knowledge of plant Science, the basic concepts of plant production, land resources and soil science, and integrated concept of plant protection against of pests and diseases* *Student capable to apply knowledge to identify, diagnose, analyze, plan and apply integrated pest and plant disease control* *Student capable to communicate orally and in writing, work in a team, interact with other people from different backgrounds, skilled in organizing and leading in various situations*	CPL-2 CPL-4 CPL-10 CPL-12 *PLO-2* *PLO-4* *PLO-10* *PLO-12*
Isi ***Content***	Mata kuliah ini memberikan pemahaman tentang ciri,morfologi dan fisiologi bakteri secara umum, struktur sel bakteri, nutrisi dan pertumbuhan, taksonomi bakteri, diagnosis penyakit bakteri tumbuhan dan identifikasi bakteri, patogenesis bakteri patogen, contoh bakteri patogen dan faktor lingkungan yang mempengaruhi, dan eksplorasi bakteri yang menguntungkan atau bermanfaat serta pengendalian penyakit bakteri *This course provides an understanding of the characteristics, morphology and physiology of bacteria in general, bacterial cell structure, nutrition and growth, bacterial taxonomy, diagnosis of bacterial plant diseases and identification of bacteria, pathogenesis of pathogenic bacteria, examples of pathogenic bacteria and environmental factors that*	

<table>
<tr><td></td><td>influence them, and exploration of bacteria. which are beneficial or useful as well as controlling bacterial diseases</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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Reading list</td><td>1. Buttimer, C., McAuliffe, O., Ross, R. P., Hill, C., O'Mahony, J., & Coffey, A. (2017). Bacteriophages and bacterial plant diseases. Frontiers in microbiology, 8, 34.
2. Morales-Cedeño, L. R., del Carmen Orozco-Mosqueda, M., Loeza-Lara, P. D., Parra-Cota, F. I., de Los Santos-Villalobos, S., & Santoyo, G. (2021). Plant growth-promoting bacterial endophytes as biocontrol agents of pre-and post-harvest diseases: Fundamentals, methods of application and future perspectives. Microbiological Research, 242, 126612.
3. Mostafa, A. A., Al-Askar, A. A., Almaary, K. S., Dawoud, T. M., Sholkamy, E. N., & Bakri, M. M. (2018). Antimicrobial activity of some plant extracts against bacterial strains causing food poisoning diseases. Saudi journal of biological sciences, 25(2), 361-366.
4. Parray, J. A., Jan, S., Kamili, A. N., Qadri, R. A., Egamberdieva, D., & Ahmad, P. (2016). Current perspectives on plant growth-promoting rhizobacteria. Journal of Plant growth regulation, 35, 877-902.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Entomologi Pertanian *Agricultural Entomology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191224 *PG191224*
Kursus (jika ada) ***Course (if applicable)***	Entomologi Pertanian *Agricultural Entomology*
Semester ***Semester***	IV (Empat) *4th (Fourth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Wiwin Windriyanti, M.P.
Pengajar ***Lecturer***	1. Dr. Ir. Wiwin Windriyanti, M.P. 2. Noni Rahmadhini., S.P., M.P. 3. Dita megasari., S.P., M.P. 4. Ramadhani Mahendra Kusuma., S.P., M.P.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*3. Kuliah: 100 menit/pertemuan (14 pertemuan)* *4. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit	3 SKS

Credit point	*3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Dasar Perlindungan Tanaman *Basic of Plant Protection*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan klasifikasi serangga Mahasiswa memahami mengenai anatomi berbagai macam jenis serangga Mahasiswa mampu mengindentifikasi serangga Mahasiswa mengetahui penggunaan bidang molekuler terhadap serangga Mahasiswa mampu melakukan konservasi terhadap lingkungan, pangan dan kesehatan Students are able to explain the classification of insects Students understand the anatomy of various types of insects Students are able to identify insects Students know the use of the molecular field against insects Students are able to conserve the environment, food and health	CPL-4 CPL-4 CPL-4 CPL-5 CPL-5 *PLO-4* *PLO-4* *PLO-4* *PLO5* *PLO-5*
Isi ***Content***	Serangga dan Entomologi, Anatomi Luar, Anatomi Dalam (Sistem Syarat dan Sistem Pernafasan), Anatomi Dalam (Sistem Pencernaan dan Sistem Peredaran Darah), Anatomi Dalam (Sistem Ekskresi dan Sistem Reproduksi), Pertumbuhan dan Perkembangan Serangga, Jenis Perilaku dan Komunikasi Serangga, Pengenalan Ordo Serangga (Odonata, Orthoptera, Mantodea, Thysanoptera, Hemiptera), Pengenalan Ordo Serangga (Blattodea, Hymenoptera, Coleoptera, Lepidoptera, Diptera), Identifikasi Serangga secara Konvensional, Identifikasi Serangga secara Molekuler, Molecular Applied for Entomology, Entomologi Terapan (Konservasi Lingkungan, Pangan, Kesehatan) *Insects and Entomology, External Anatomy, Internal Anatomy (Terminal System and Respiratory System), Internal Anatomy (Digestive System and Circulatory System), Internal Anatomy (Excretory System and Reproductive System), Insect Growth and Development, Types of Insect Behavior and Communication, Introduction Insect Orders (Odonata, Orthoptera, Mantodea, Thysanoptera, Hemiptera), Introduction to Insect Orders (Blattodea, Hymenoptera, Coleoptera, Lepidoptera, Diptera), Conventional Insect Identification, Molecular Insect Identification, Molecular Applied for Entomology, Applied Entomology (Environmental Conservation, Food, Health)*	

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Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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Reading list</td><td>1. Hidayat P, Siddikah F, Kasmiatun, Noerdjito WA, Amrulloh R, Hiola MS, Najmi L, Nazarreta R, Scheu S, Buchori D, Drescher J (2022) Guidebook of beetles and weevils of Jambi, Sumatra, Indonesia. e-Publishing Penerbit BRIN, ISBN-13 (15) 978-623-7425-71-7 doi.org/10.55981/brin.321
2. Tihelka, E., Cai, C., Giacomelli, M., Lozano-Fernandez, J., Rota-Stabelli, O., Huang, D., ... & Pisani, D. (2021). The evolution of insect biodiversity. Current Biology, 31(19), R1299-R1311.
3. Harald W. Krenn. 2019. Insect Mouthparts: Form, Function, Development and Performance. Springer Nature, Switzerland. 683 pages. https://doi.org/10.1007/978-3-030-29654-4
4. David A. Grimaldi. 2023. The Complete Insect: Anatomy, Physiology, Evolution, and Ecology. Princeton University Press, New Jersey. 368 pages.</td></tr>
</table>

COURSE MODULE
AGROTECHNOLOGY STUDY PROGRAM
FACULTY OF AGRICULTURE
UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR

Nama Modul ***Module name***	Mikologi Pertanian *Agricultural Mycology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191225 *PG191225*
Kursus (jika ada) ***Course (if applicable)***	Mikologi Pertanian *Agricultural Mycology*
Semester ***Semester***	V (Lima) *5th (Fifth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Tri Mujoko, M.P.
Pengajar ***Lecturer***	1. Dr. Ir. Tri Mujoko, MP. 2. Dr. Ir. Sri Wiyatiningsih, MP. 3. Dr. Ir. Penta Suryaminarsih, MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*5. Kuliah: 100 menit/pertemuan (14 pertemuan)* *6. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*

Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Biologi Pertanian, Mikrobiologi Pertanian *Agricultural Biology, Agricultural Microbiology*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menerapkan pengetahuan Ilmu Tanaman dan konsep dasar Produksi Tanaman, Tanah dan konsep dasar Sumber daya lahan, serta konsep perlindungan tanaman terhadap hama Penyakit secara terpadu Mahasiswa mampu menguasai prinsip-prinsip penerapan teknologi pertanian untuk mengevaluasi permasalahan di bidang pertanian Mahasiswa mampu menganalisis, merencanakan dan menerapkan sistem pertanian dataran rendah mengacu pada prinsip pertanian berkelanjutan, baik yang bersifat modern maupun yang mengangkat kearifan lokal, secara efektif dan produktif Mahasiswa mampu mendiagnosa, menganalisis dan menyelesaikan permasalahan hama penyakit tanaman *Student capable to apply the knowledge of plant Science, the basic concepts of plant production, land resources and soil science, and integrated concept of plant protection against of pests and diseases* *Student capable to apply the principles of agricultural technology to solve agricultural problems* *Student capable to analyze, plan and implement lowland agricultural systems referring to the principles of sustainable agriculture, both modern and local wisdom, effectively and productively* *Student capable to apply knowledge to identify, diagnose, analyze, plan and apply integrated pest and plant disease control.*	CPL-4 CPL-5 CPL-6 CPL-10 *PLO-4* *PLO-5* *PLO-6* *PLO-10*
Isi ***Content***	Materi pembelajaran dalam kuliah ini terdiri dari Peran dan ciri ciri jamur, Ekologi dan habitat. Cara pembiakan sexsual asexsual, sistematika dan klasifikasi jamur, Jamur tingkat rendah (Klas Myxomytes,Chytridiomycetes,zygomycetes, Trichomycetes), jamur tingkat tinggi (Klas Ascomycetes, Kelas Basidiomycetes dan Deuteromycetes). Peran Jamur di lingkup Pertanian, jamur yang menguntungkan, Jamur jamur yang merugikan *The learning material in this lecture consists of the role and characteristics of fungi, ecology and habitat. How to reproduce sexually asexually, systematics and classification of fungi, lower fungi (Class Myxomytes, Chytridiomycetes, zygomycetes, Trichomycetes), higher fungi (Class Ascomycetes, Class Basidiomycetes and Deuteromycetes). The role of fungi in agriculture, beneficial fungi, harmful fungi*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%	

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Daftar bacaan ***Reading list***	1. Crystovel, J. (2016). Mikologi Tanaman. *Universitas Padjadjaran. Sumedang*. 2. Ginting, C., & Prasetyo, J. (2016). Jamur Patogen Tumbuhan. 3. Hartati, S., Wiyono, S., Hidayat, S. H., & Sinaga, M. S. (2017). Karakterisasi morfologi dan pemanfaatan sumber karbon oleh khamir antagonis patogen antraknosa. *Jurnal Mikologi Indonesia*, *1*(2), 47-60. 4. Listiyowati, S., Rustiani, T., & Rahayu, G. (2023). Identification and antagonistic mechanism of entomopathogenic fungi against Fusarium oxysporum f. sp. cubense, causal agents of banana's panama disease. *Jurnal Fitopatologi Indonesia*, *19*(3), 99-110.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Pola Tanam *Cropping Pattern*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191202 *PG191202*
Kursus (jika ada) ***Course (if applicable)***	Pola Tanam *Cropping Pattern*
Semester ***Semester***	V (Lima) *5th (Fifth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Ida Retno M., M.P.
Pengajar ***Lecturer***	Dr. Ir. Ida Retno M., M.P. Ir. Didik Utomo P., M.P. Nova Triani, S.P., M.P.
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	*Program Studi: Program Studi Agroteknologi* *Spesialisasi: Agronomi* *Jenis: Pilihan* *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ECTS*

Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan dan mendemonstrasikan prinsip pola tanam, bentuk pola tanam, efisiensi penggunaan lahan, dan penerapan kalender tanam. Mahasiswa mampu menjelaskan ciri-ciri tumbuhan dalam penerapan sistem pola tanam, pengaruh pola tanam terhadap lingkungan tumbuh tanaman, dan faktor-faktor yang berperan dalam penentuan pola tanam. Mahasiswa mampu merangkum dan mendemonstrasikan prinsip penerapan pola tanam untuk kemajuan teknologi pertanian guna mengatasi permasalahan terkait penyediaan pangan. *Students are capable of explaining and demonstrating the principles of planting patterns, forms of planting patterns, land use efficiency, and the application of planting calendars.* *Students are capable of explaining the characteristics of plants in the application of planting pattern systems, the impact of planting patterns on the plant's growth environment, and the factors involved in determining planting patterns.* *Students are capable of summarizing and demonstrating the principles of applying planting patterns for the advancement of agricultural technology to address issues related to food supply*.	CPL-4 CPL-7 CPL-8 *PLO 4* *PLO 7* *PLO 8*
Isi ***Content***	Ruang lingkup dan peran ilmu pola tanam, klasifikasi pola tanam, karakteristik tanaman pada penerapan pola tanam, pengaruh pola tanam pada lingkungan tumbuh tanaman, penghitungan dan analisis efisiensi penggunaan lahan, faktor dalam penentuan pola tanam, sistem penggunaan lahan agroforestri dan perkebunan dalam pola tanam, Konsep Rumah Pangan Lestari, strategi pengembangan pola tanam di Indonesia, konsep pertanian berbasis non-lahan, konsep zero waste agriculture, konsep pertanian pintar, konsep pertanian presisi, penanggalan Pranata Mangsa dan Kalender Tanam dalam pola tanam. *The scope and role of cropping pattern science, classification of cropping patterns, plant characteristics in the application of cropping patterns, the influence of cropping patterns on the plant growing environment, calculation and analysis of land use efficiency, factors in determining cropping patterns, agroforestry and plantation land use systems in cropping patterns, Sustainable Food House concept, strategy for developing cropping patterns in Indonesia, non-land based farming concept, zero waste agriculture concept, smart farming concept, precision farming concept, Pranata Mangsa calendar and Planting Calendar in cropping patterns.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20%	

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Structured Tasks 30%
Practice 20%

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<tr><td>Media yang digunakan
Media employed</td><td>

Yamane, K., Atsuyoshi Ikoma & Morio Iijima. 2016. Performance of double cropping and relay intercropping for black soybean production in small-scale farms. Plant Production Science. 19(4), 449–457
Sugihardjo, J Sutrisno, P Setyono and Suntoro. 2018. Climate change and farmers' cropping patterns in Cemoro watershed area, Central Java, Indonesia. IOP Conf. Series: Earth and Environmental Science 129:1-6
Yudhana,Anton, Muhammad Ramadani, Arsyad Cahya Subrata, Hendril Satrian Purnama. 2018. Otomasi dan Instrumentasi untuk Proyek Smart Farming dan Smart Glove. CV Mine. Yogyakarta.
Dwivedi, Ashish, R. K. Naresh, Robin Kumar, Rajveer Singh Yadav and Rakesh Kumar. 2017. Precision Agriculture. Parmar Publishers & Distributors, Dhanbad, Jiharkhand.
Max v. Schönfeld, Reinhard Heil and Laura Bittner. 2018. Big Data on a Farm-Smart Farming. SpringerBriefs.
Heike Bach and Wolfram Mauser. 2018. Sustainable Agriculture and Smart Farming. ISSI Scientific Report Series 15.

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

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Geomorfologi dan Analisis Landscape *Geomorpholgy and Landscape Analysis*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 141216 *PG 141216*
Kursus (jika ada) ***Course (if applicable)***	Geomorfologi dan Analisis Landscape *Geomorpholgy and Landscape Analysis*
Semester ***Semester***	V (Lima) *5th (Fifth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Ir. Kemal Wijaya, MT.
Pengajar ***Lecturer***	Ir. Kemal Wijaya, MT. Haidar Fari Aditya, SP., MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Dasar Ilmu Tanah *Basic of Soil Science*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*
Persyaratan sesuai ketentuanujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Prasyarat wajib ***Mandatory prerequisites***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Elective*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menganalisis, merencanakan dan menerapkan sistem pertanian dataran rendah mengacu pada prinsip pertanian berkelanjutan, baik yang bersifat modern maupun yang mengangkat kearifan lokal, secara efektif dan produktif Mahasiswa mampu mengidentifikasi, merumuskan, menganalisis dan menyelesaikan permasalahan bidang sumberdaya lahan Mahasiswa mampu menguasai prinsip dan isu terkini tentang pertanian dataran rendah dan permasalahan lingkungannya *Student capable to analyze, plan and implement lowland agricultural systems referring to the principles of sustainable agriculture, both modern and local wisdom, effectively and productively* *Student capable to analyze, plan and implement lowland agricultural systems referring to the principles of sustainable agriculture, both modern and local wisdom, effectively and productively* *Student capable to manage lowland agricultural systems and related environmental issues*	CPL-6 CPL-9 CPL-11 *PLO-6* *PLO-9* *PLO-11*
Isi ***Content***	Ruang lingkup dasar-dasar geologi, teori pembentukan bumi, teoeri tektonik lempeng, struktur geologi, agen-agen pembentuk bentang alam, klasifikasi orde bentang alam, satuan geomorfologi, gerakan tanah, air tanah, mata air, analisis pola aliran sungai, pemahaman tentang sifat-sifat dan pola kontur dan hubungan satuan geomorfologi dengan bentuk aliran sungai, analisis berbasis peta topografi dan peta rupa bumi, aplikasi software analisis lanskap, dan citra satelit serta pengamatan langsung di lapangan dan mampu mengaplikasikan klasifikasi, pemerian dan genesa tanah yang ada di permukaan bumi *Scope of the basics of geology, theory of earth formation, plate tectonic theory, geological structure, landform forming agents, classification of landforms, geomorphological units, land movements, groundwater, springs, analysis of river flow patterns, understanding of the nature of - the nature and pattern of contours and the relationship of geomorphological units with the shape of river flows, analysis based on topographic maps and earth maps, landscape analysis software applications, and satellite imagery as well as direct observations in the field and being able to apply the classification, description and genesis of soil on the earth's surface*	
Persyaratan belajar dan ujian serta bentuk ujian	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30%	

<table>
<tr><td>Study and examination requirements and forms of examination</td><td>

Middle Exam 20%
Structured Tasks 30%
Practice 20%

<table>
<tr><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th></tr>
<tr><td>≥ 80 – 100</td><td>A</td><td>4.00</td><td>≥ 58 – <64</td><td>C+</td><td>2.50</td></tr>
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</table>
</td></tr>
<tr><td>Media yang digunakan
Media employed</td><td>Hardwares : Projector and screensr, reference book, sound system
Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>

Zinck, J.A., Metternicht, G.I., del Valle, H.F and Angelini, M. (Editor). 2023. Geopedology: An Integration of Geomorphology and Pedology for Soil and Landscape Studies Second edition. Springer International Publishing, Cham.
Adrian Harvey. 2022. Introducing Geomorphology: A Guide to Landforms and Processes second Edition. Dunedin Academic Press.
Bierman, P.R. and Montgomery, D.R. 2020. Key concepts in geomorphology. Macmillan Learning, Austin.
Paolo Tarolli and Simon Marius Mudd. 2020. Remote Sensing of Geomorphology: Volume 23. Elsevier, Amsterdam, Netherlands.

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

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Pengantar Arsitektur Lanskap *Introduction Landscape Design*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191203 *PG191203*
Kursus (jika ada) ***Course (if applicable)***	Pengantar Arsitektur Lanskap *Introduction Landscape Design*
Semester ***Semester***	V (Lima) *5th (Fifth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Pangesti Nugrahani, M.Si
Pengajar ***Lecturer***	. Dr. Ir. Pangesti Nugrahani, M.Si . Ir. Yonny Koentjoro, MP . Prof. Dr. Ir. Juli Santosa, MP. . Fadila Suryandika, STP, M.Sc
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomi Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit	3 SKS

<table>
<tr><td>Credit point</td><td>3 credits or 4.8 ECTS</td></tr>
<tr><td>Persyaratan sesuai ketentuanujian
Requirements according to theexamination regulations</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

<table><tr><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th></tr><tr><td>≥ 80 – 100</td><td>A</td><td>4.00</td><td>≥ 58 – <64</td><td>C+</td><td>2.50</td></tr><tr><td>≥ 76 – <80</td><td>A-</td><td>3.75</td><td>≥ 54 – <58</td><td>C</td><td>2.00</td></tr><tr><td>≥ 72 – <76</td><td>B+</td><td>3.50</td><td>≥ 50 – <54</td><td>C-</td><td>1.75</td></tr><tr><td>≥ 68 – <72</td><td>B</td><td>3.00</td><td>≥ 46 –<50</td><td>D+</td><td>1.50</td></tr><tr><td>≥ 64 – <68</td><td>B-</td><td>2.75</td><td>≥ 42 – <46</td><td>D</td><td>1.00</td></tr><tr><td></td><td></td><td></td><td>0 - < 42</td><td>E</td><td>0.00</td></tr></table></td></tr>
<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td>-</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mahasiswa dapat mengenal bidang arsitektur lanskap — CPL-6
Mahasiswa mampu menjelaskan aspek fungsional tumbuhan dan bangunan dalam arsitektur lansekap. — CPL-8
Mahasiswa mampu melakukan analisis lokasi, perencanaan dan desain lanskap skala mikro
Mahasiswa mampu mengkomunikasikan presentasi grafis arsitektur lansekap — CPL-12

Students can recognize the field of landscape architecture — PLO 6
Students capable to explain the functional aspects of plants and buildings in landscape architecture.
Students capable to conduct site analysis, planning and design of micro-scale landscapes — PLO 6
Students capable to communicate graphic presentation of landscape architecture — PLO 12</td></tr>
<tr><td>Isi
Content</td><td>Mata kuliah ini membahas tentang pengertian, ruang lingkup, sejarah dan perkembangan arsitektur lansekap, serta hubungannya dengan ilmu-ilmu terkait dan profesi arsitektur lansekap. Pengenalan elemen desain lansekap, material lanskap lunak dan keras, dan analisis lokasi. Karakter dan pemahaman visual elemen desain lansekap khususnya untuk lanskap tropis. Proses desain lansekap taman perumahan dan taman lingkungan, hingga presentasi grafis. Pemahaman aspek pemeliharaan lanskap. Memahami metode evaluasi estetika dan penggunaan perangkat lunak untuk karya arsitektur lanskap.

This course discusses the definition, scope, history and development of landscape architecture, as well as its relationship with related sciences and the profession of landscape architecture. Introduction to landscape</td></tr>
</table>

<table>
<tr><td></td><td>design elements, soft and hard landscape materials, and site analysis. Character and visual understanding of landscape design elements, especially for tropical landscapes. Landscape design process of residential garden and neighborhood garden scale, up to graphic presentation. Understanding of landscape maintenance aspects. Understanding of aesthetic evaluation methods and the use of software for landscape architecture work.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
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<tr><td>Daftar bacaan
Reading list</td><td>1. Loehrlein, M. (2020). Sustainable landscaping: principles and practices. CRC Press.
2. Majewska, A. A., & Altizer, S. (2020). Planting gardens to support insect pollinators. Conservation Biology, 34(1), 15-25.
3. Robinson, N. (2017). The planting design handbook. Routledge.
4. Uroy, L., Ernoult, A., & Mony, C. (2019). Effect of landscape connectivity on plant communities: a review of response patterns. Landscape ecology, 34, 203-225.
5. von Haaren, C., Lovett, A. A., & Albert, C. (2019). Landscape planning with ecosystem services. Springer Netherlands.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Kultur Jaringan *Plant Tissue Culture*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191201 *PG191201*
Kursus (jika ada) ***Course (if applicable)***	Kultur Jaringan *Plant Tissue Culture*
Semester ***Semester***	V (Lima) *5th (Fifth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Pangesti Nugrahani, M.Si.
Pengajar ***Lecturer***	1. Dr. Ir. Pangesti Nugrahani, M.Si. 2. Dr. Dra. Sutini, M.Pd. 3. Puji Lestari Tarigan, SP., M.Sc.
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomy Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*

Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ECTS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu memahami konsep, prinsip, dan prosedur di bidang kultur jaringan tanaman. Mahasiswa mampu memahami dan mampu merancang laboratorium kultur jaringan tanaman dengan fasilitas dan peralatan yang diperlukan serta fasilitas dan peralatan yang diperlukan. Mahasiswa mampu membuat media kultur, kultur kalus, kultur pucuk, kultur benih, dan kultur embrio, serta mampu menumbuhkannya menjadi planlet dan kultur embrio, serta mampu menumbuhkannya menjadi planlet. Mahasiswa mampu melakukan aklimatisasi dan menganalisis permasalahan dalam kultur jaringan tanaman. *Student capable to understand the concepts, principles, and procedures in the field of tissue culture plants.* *Student capable to understand and be able to design a plant tissue culture laboratory with the necessary facilities and equipment along with the necessary facilities and equipment.* *Student capable to make culture media , callus culture, shoot culture, seed culture, and embryo culture, and be able to grow them to plantlets and embryo culture, and able to grow them into plantlets.* *Student capable to perform acclimatisation and analyse problems in plant tissue culture*	CPL-4 CPL-8 CPL-10 CPL-9 *PL0-4* *PLO-8* *PLO-10* *PLO-9*
Isi ***Content***	Mata kuliah ini mempelajari tentang sejarah kultur jaringan tanaman, pengertian dan pentingnya kultur jaringan tanaman, perencanaan laboratorium, sarana dan peralatan kultur jaringan, manfaat dan konsep kultur jaringan tanaman, media kultur jaringan tanaman, teknik sterilisasi, pengaruh faktor lingkungan, permasalahan dalam kultur jaringan, embriogenesis dan organogenesis somatik, kultur kalus, kultur pucuk, kultur embrio, kultur benih, dan aklimatisasi kultur tanaman. *The course studies the history of plant tissue culture, understanding and importance of plant tissue culture, laboratory planning, tissue culture facilities and equipment, benefits and concepts of plant tissue culture, plant tissue culture medium, sterilization techniques, the influence of environmental factors, problems in tissue culture, somatic*	

<table>
<tr><td></td><td>embryogenesis and organogenesis, callus culture, shoot culture, embryo culture, seed culture, and acclimatization of plant cultures.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: True-False, Multiple Choice, and Essay or Assignment
● Final Score Components:
● Final Exam 35%
● Middle Exam 25%
● Structured Tasks 20%
● Quiz 20%

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Reading list</td><td>1. Hapsoro, D. and Yusnita. 2020. Kultur Jaringan, Teori dan Praktik. Penerbit: Andi.
2. Nugrahani, P and Pribadi D.U. 2020. Morfogenesis Dan Induksi Kalus Tin (Ficus carica L.) Pada Media Murashige & Skoog (MS) Dengan Penambahan Benzylaminopurine. Jurnal Agroteknologi, 13(2), 156-163.
3. Prasetyorini. 2019. Buku Ajar Kultur Jaringan. Lembaga Penerbit: Penelitian dan Pengabdian Masyarakat Universitas Pakuan.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Konservasi Tanah dan Air *Soil and Water Conservation Technology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191214 *PG 191214*
Kursus (jika ada) ***Course (if applicable)***	Konservasi Tanah dan Air *Soil and Water Conservation*
Semester ***Semester***	V (Lima) *5th (Fifth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Ir. Purwadi, MP.
Pengajar ***Lecturer***	Ir. Purwadi, MP. Dr. Ir. Bakti Wisnu Widjajani, MP. Fitri Wijayanti, SP., MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*

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<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td>Dasar Ilmu Tanah
Basic of Soil Science</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td></td></tr>
<tr><td>Isi
Content</td><td>Konservasi Tanah dan Air meliputi: Pemahaman kerusakan tanah global. Proses dan masalah kerusakan tanah. Proses erosi dan faktor yang mempengaruhinya. Erosivitas hujan. Erodibilitas tanah. Topografi. Tanaman dan pengelolaan tanah. Klasifikasi umum kemampuan lahan. Perencanaan konservasi tanah dengan cara mekanis. Konservasi dengan pengelolaan tanaman. Modeling untuk penaksiran kehilangan tanah. Kebijaksanaan pemerintah dalam konservasi tanah.

Soil and Water Conservation includes: Understanding global soil degradation. Soil degradation processes and problems. The erosion process and the factors that influence it. Rain erosivity. Soil erodibility. Topography. Crops and soil management. General classification of land capabilities. Soil conservation planning by mechanical means. Conservation with plant management. Modeling for assessing land loss. Government policy in soil conservation</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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Daftar bacaan ***Reading list***	1. Gachene, C. K., Nyawade, S. O., & Karanja, N. N. (2020). Soil and water conservation: An overview. *Zero Hunger*, 810-823. 2. Laurentia, I. S. C., & Triweko, I. R. W. (2020). *Konservasi Tanah Dan Air*. CV. Pilar Nusantara. 3. Taslim, R. K., Mandala, M., & Indarto, I. (2019). Prediksi Erosi di Wilayah Jawa Timur: Penerapan USLE dan GIS. *Jurnal Ilmu Lingkungan*, *17*(2), 323-332. 4. Trimanto, T., Annisa, D. W., & Hanasari, D. (2020). Karakterisasi morfologi, perbanyakan vegetatif dan potensi bambu (Gigantochloa dan Schizostachyum) sebagai tanaman untuk konservasi tanah dan air. *Jurnal Pemuliaan Tanaman Hutan*, *14*(1), 43-53. 5. Zaafrano, R., Suhartanto, E., & Prasetyorini, L. (2023). Analisis Indeks Bahaya Erosi Berbasis Sistem Informasi Geografis (SIG) Pada DAS Petung Kabupaten Pasuruan Jawa Timur. *Jurnal Teknologi dan Rekayasa Sumber Daya Air*, *3*(2), 733-745.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Morfologi dan Klasifikasi Tanah *Soil Morphology and Classification*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191212 *PG 191212*
Kursus (jika ada) ***Course (if applicable)***	Morfologi dan Klasifikasi Tanah *Soil Morphology and Classification*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Maroeto, MP.
Pengajar ***Lecturer***	Dr. Ir. Maroeto, MP. Haidar Fari Aditya, SP., MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*

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Requirements according to the examination regulations</td><td>Mahasiswa harus menghadiri 75% perkuliahan
Students must attend 75% of lectures</td></tr>
<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td>Dasar Ilmu Tanah
Basic of Soil Science</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mahasiswa mampu menjelaskan tentang sifat-sifat tanah — CPL-4
Mahasiswa mampu mengidentifikasi pembentukan dan perkembangan tanah — CPL-4
Mahasiswa mampu mengklasifikasikan tanah yang dapat dimanfaatkan untuk pertanian — CPL-5

Students are able to explain the properties of soil — PLO-4
Students are able to identify the formation and development of soil — PLO-4
Students are able to classify land that can be used for agriculture — PLO-5</td></tr>
<tr><td>Isi
Content</td><td>Bahan kajian Morfologi dan klasifikasi tanah meliputi : penjelasan tentang karakteristik berbagai sifat fisik, kimia dan biologi yang terdapat dilahan beserta factor iklim yang ikut ber pengaruh terhadap pembentukan maupun dalam perkembangan tanah yang dapat dimanfaatkan untuk pertanian yang berkelanjutan

Soil morphology and classification study material includes: an explanation of the characteristics of various physical, chemical and biological properties found on land along with climatic factors that influence the formation and development of soil that can be used for sustainable agriculture.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
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Reading list</td><td>1. Gunawan, I. J., Rini Hazriani, S. P., & Mahardika, R. Y. (2020). Buku Ajar Morfologi dan Klasifikasi Tanah.
2. Rayes, M. L. (2017). Morfologi dan klasifikasi tanah. Universitas Brawijaya Press.</td></tr>
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	3. Sitinjak, A. E., Rayes, M. L., & Agustina, C. (2019). Morfologi dan klasifikasi tanah pada berbagai macam sub-landform karst di formasi Wonosari Kecamatan Gedangan, Kabupaten Malang. *Jurnal Tanah dan Sumberdaya Lahan*, *6*(01), 1055-1064. 4. Simangunsong, H. S. (2022). *Morfologi dan klasifikasi tanah pada toposekuen lereng selatan gunung sumbing kabupaten magelang* (Doctoral dissertation, Universitas Pembangunan Nasional" Veteran" Yogyakarta).

SEMESTER 6

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Nematologi Pertanian *Agricultural Nematology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191228 *PG 191228*
Kursus (jika ada) ***Course (if applicable)***	Nematologi Pertanian *Agricultural Nematology*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Drh. Wiludjeng Widajati,MP.
Pengajar ***Lecturer***	Drh. Wiludjeng Widajati,MP. Noni Rahmadhini, SP., M.Sc. Safira Rizka Lestari, SP., MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*

Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Mikrobiologi Pertanian *Agricultural Microbiology*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan mengenai nematoda dan agroekosistem Mahasiswa memahami struktur morfologi dan klasifikasi nematoda Mahasiswa memahami peran nematoda pada agroekosistem Mahasiswa mampu mengidentifikasi serangan nematoda dan akiat kerusakannya *Students are able to explain nematodes and agroecosystems* *Students understand the morphological structure and classification of nematodes* *Students understand the role of nematodes in agroecosystems* *Students are able to identify nematode attacks and their damage effects*	CPL-4 CPL-4 CPL-4 CPL-5 *PLO-4* *PLO-4* *PLO-4* *PLO-5*
Isi ***Content***	1. Definisi nematoda dan peranannya dalam agroekosistem 2. Struktur morfologi, dan klasifikasi nematoda 3. Organ dan sistem organ nematoda 4. Pengaruh faktor biotik dan abiotik terhadap sistem reproduksi, pertumbuhan & perkembangan nematoda 5. Nematoda sebagai patogen tanaman dan pengendalian nematoda patogen tanaman 6. Nematoda sebagai agens biokontrol dan pemanfaatannya di agroekosistem 7. Ujian Tengah Semester (UTS) 8. Teknik eksplorasi dan pengambilan sampel nematoda 9. Teknik ekstraksi nematoda 10. Teknik pewarnaan, identifikasi dan perhitungan nematoda 11. Teknik analisis kerusakan serangan nematoda 12. Teknik perbanyakan nematoda entomopatogen 13. Ujian Akhir Semester (UAS) 1. *Definition of nematodes and their role in agroecosystems* 2. *Morphological structure and classification of nematodes* 3. *Organs and organ systems of nematodes* 4. *The influence of biotic and abiotic factors on the reproductive system, growth & development of nematodes* 5. *Nematodes as plant pathogens and control of plant pathogenic nematodes* 6. *Nematodes as biocontrol agents and their use in agroecosystems* 7. *Midterm Exam (UTS)* 8. *Nematode exploration and sampling techniques* 9. *Nematode extraction technique* 10. *Staining techniques, identification and counting of nematodes*	

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<tr><td></td><td>11. Nematode attack damage analysis techniques
12. Technique for propagating entomopathogenic nematodes
13. Final Semester Examination (FSE)</td></tr>
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2. Sato, K., Kadota, Y., & Shirasu, K. (2019). Plant immune responses to parasitic nematodes. Frontiers in plant science, 1165.
3. Subbotin, S. A., Rius, J. E. P., & Castillo, P. (2021). Systematics of root-knot nematodes (Nematoda: Meloidogynidae) (Vol. 14). Brill.
4. Wulandari, D. R., Sudana, I. M., & Singarsa, I. D. P. (2019). Tingkat Fekunditas Nematoda (Meloidogyne spp.) pada Beberapa Tanaman yang Tergolong Familia Solanaceae. Jurnal Agroekoteknologi Tropika ISSN, 2301, 6515.</td></tr>
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	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Dasar Perencanaan dan Pembangunan Wilayah *Basic of Regional Planning and Development*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191208 *PG 191208*
Kursus (jika ada) ***Course (if applicable)***	Dasar Perencanaan dan Pembangunan Wilayah *Basic of Regional Planning and Development*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Ir. Kemal Wijaya, MT.
Pengajar ***Lecturer***	Ir. Kemal Wijaya, MT. Ir. Siswanto, MT. Dr.Ir. Purnomo Edi Sasongko, MP. Dr.Ir. Hery Nirwanto, MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
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Angka kredit	*3 SKS*

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<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td colspan="2">-</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mahasiswa mampu memahami mengenai perencanaan wilayah
Mahasiswa mampu menganalisis perencanaan wilayah
Mahasiswa mampu melaksanakan kegiatan perencanaan wilayah

Students are able to understand regional planning
Students are able to analyze regional planning
Students are able to carry out regional planning activities</td><td>CPL-4

CPL-4
CPL-5

PLO-4
PLO-4
PLO-5</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Mata kuliah ini membahas konsep, kaidah dan teori perencanaan pembangunan daerah, mendeskripsikan, menganalisis dan melaksanakan pemanfaatan sumber daya alam, sosial dan ekonomi dalam perencanaan wilayah serta mampu menganalisis dan melaksanakan analisis perencanaan dalam menunjang kegiatan penelitian dan pengabdian kepada masyarakat.

This course describe, analyze and implement concepts, rules and theories of regional development planning, describe, analyze and implement the use of natural, social and economic resources in regional planning and capable to analyze and implement planning analysis in supporting research and community service activities.</td></tr>
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	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Produksi Agensia Hayati *Biological Agent Production Technology*
Level modul ***Module level***	Sarjana *Bachelor Degree / Undergraduate*
Kode ***Code***	PG141212 *PG141212*
Kursus (jika ada) ***Course (if applicable)***	Teknologi Produksi Agensia Hayati *Biological Agent Production Technology*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Yenny Wuryandari, MP.
Pengajar ***Lecturer***	Dr. Ir. Yenny Wuryandari, M.P. Dr. Ir.Penta Suryaminarsih, M.P. Dr. Ir. Wiwin Windriyati, M.P. Dita Megasari, S.P., M.P.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
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Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Biologi Pertanian, Mikrobiologi Pertanian *Agricultural Biology, Agricultural Microbiology*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa memahami konsep pengendalian hama dan penyakit secara hayati Mahasiswa memahami klasifikasi dan jenis agensia hayati Mahasiswa mampu membuat formulasi agensia hayati Mahasiswa mampu mengaplikasikan agensia hayati *Students understand the concept of biological control of pests and diseases* *Students understand the classification and types of biological agents* *Students are able to make biological agent formulations* *Students are able to apply biological agents*	CPL-4 CPL-4 CPL-4 CPL-5 *PLO-4* *PLO-4* *PLO-4* *PLO-5*
Isi ***Content***	1. Konsep pengendalian hama penyakit tanaman secara hayati, 2. Klasifikasi dan jenis agensia hayati dan musuh alami, 3. Mekanisme kerja agensia hayati, 4. Teknologi produksi agensia hayati untuk pengendalian hama penyakit 5. Teknik pembuatan formula agensia hayati 6. Teknik aplikasi agensia hayati maupun musuh alami di lapangan *1. The concept of biological control of plant pests and diseases,* *2. Classification and types of biological agents and natural enemies,* *3. Mechanism of action of biological agents,* *4. Production technology for biological agents to control pests and diseases* *5. Techniques for making biological agent formulas* *6. Application techniques for biological agents and natural enemies in the field*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%	

	<table><tr><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th></tr><tr><td>≥ 80 – 100</td><td>A</td><td>4.00</td><td>≥ 58 – <64</td><td>C+</td><td>2.50</td></tr><tr><td>≥ 76 – <80</td><td>A-</td><td>3.75</td><td>≥ 54 – <58</td><td>C</td><td>2.00</td></tr><tr><td>≥ 72 – <76</td><td>B+</td><td>3.50</td><td>≥ 50 – <54</td><td>C-</td><td>1.75</td></tr><tr><td>≥ 68 – <72</td><td>B</td><td>3.00</td><td>≥ 46 –<50</td><td>D+</td><td>1.50</td></tr><tr><td>≥ 64 – <68</td><td>B-</td><td>2.75</td><td>≥ 42 – <46</td><td>D</td><td>1.00</td></tr><tr><td></td><td></td><td></td><td>0 - < 42</td><td>E</td><td>0.00</td></tr></table>
Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Daftar bacaan ***Reading list***	1. Intarti, D. Y., Kurniasari, I., & Sudjianto, A. (2020). Efektivitas agen hayati Beauveria bassiana dalam menekan hama Thrips sp. pada tanaman cabai rawit (Capcisum frutescens L.). *Agrovigor: Jurnal Agroekoteknologi*, *13*(1), 10-15. 2. Köhl, J., Kolnaar, R., & Ravensberg, W. J. (2019). Mode of action of microbial biological control agents against plant diseases: relevance beyond efficacy. *Frontiers in plant science*, 845. 3. Oliyani, A., & Fikri, E. N. (2018). Pengendalian Penyakit Diplodia Pada Tanaman Jeruk Dengan Mikroorganisme Antagonis. *JURNAL PROTEKSI TANAMAN TROPIKA*, *1*(1), 4-7. 4. Pu'u, Y. M., & Syatrawati, S. (2022). Potensi pengendalian hayati hama spodoptera frugiperda untuk keberlanjutan produksi jagung. *Agrica: Journal of Sustainable Dryland Agriculture*, *15*(2), 144-160.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Hortikultura Lanskap *Horticulture Landscape*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191205 *PG191205*
Kursus (jika ada) ***Course (if applicable)***	Hortikultura Lanskap *Horticulture Landscape*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Pangesti Nugrahani, M.Si
Pengajar ***Lecturer***	1. Dr. Ir. Pangesti Nugrahani, M.Si 2. Dr. Ir. Nora Augustien K, MP 3. Ir. Yonny Koentjoro, MP
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomi Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credits or 3.2 ECTS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Prasyarat wajib ***Mandatory prerequisites***	Pengantar Arsitektur Lanskap *Introduction to Landscape Design*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan pengertian hortikultura lanskap, menyebutkan pemanfaatan tanaman hortikultura khususnya tanaman hias dalam penataan lingkungan atau lanskap, baik di dalam maupun di luar ruangan. Mahasiswa mampu membuat desain taman outdoor dan indoor. Mahasiswa mampu mengembangkan kreativitas yang dapat meningkatkan nilai tambah tanaman hias antara lain bonsai, rangkaian bunga, poutporri, terarium dan sebagainya. *Students capable to explain the meaning of landscape horticulture, mention the use of horticultural plants, especially ornamental plants in environmental or landscape arrangements, both indoor and outdoor.* *Students capable to make outdoor and indoor garden designs.* *Students capable to develop creativity that can increase the added value of ornamental plants, including bonsai, flower arrangements, poutporri, terrariums and so on.*	CPL-4 CPL-5 CPL-12 *PLO-4* *PLO-5* *PLO-12*
Isi ***Content***	Mata kuliah ini mempelajari pengertian hortikultura lanskap, pemanfaatan tanaman hortikultura khususnya tanaman hias dalam penataan lingkungan atau lanskap, baik indoor maupun outdoor. Selain itu, pada mata kuliah ini mahasiswa diajak membuat desain taman outdoor dan indoor. Sehingga melalui mata kuliah ini mahasiswa belajar mengembangkan kreativitas yang dapat meningkatkan nilai tambah tanaman hias antara lain Bonsai, rangkaian bunga, poutporri, terarium dan lain sebagainya. *This course studies the understanding of landscape horticulture, the use of horticultural plants, especially ornamental plants in environmental or landscape arrangements, both indoor and outdoor. In addition, in this course students are invited to make outdoor and indoor garden designs. So that through this course students learn to develop creativity that can increase the added value of ornamental plants, including Bonsai, flower arrangements, poutporri, terrariums and so on.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%	

Final Grade	Letter Grade	Grade Point	Final Grade	Letter Grade	Grade Point

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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Daftar bacaan ***Reading list***	1. Datta, S. K., & Gupta, Y. C. (Eds.). (2022). *Floriculture and Ornamental Plants*. Springer Nature. 2. Meyer, E. (2020). Site citations: the grounds of modern landscape architecture. In *Site Matters* (pp. 38-64). Routledge. 3. Singh, A. K., & Sisodia, A. (2020). *Textbook of floriculture and landscaping*. New India Publishing Agency. 4. Technical Guidelines for Increasing Fruit and Floriculture Production for Fiscal Year 2021, Directorate of Fruit and Floriculture Directorate General of Horticulture Ministry of Agriculture 2021

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknik Analisa Laboratorium *Laboratory Analytics*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191221 *PG 191221*
Kursus (jika ada) ***Course (if applicable)***	Teknik Analisa Laboratorium *Laboratory Analytics*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr.Ir. Wanti Mindari. MP
Pengajar ***Lecturer***	Dr.Ir. Wanti Mindari. MP Ir. Siswanto, MT. Fitri Wijayanti, SP, MP Ir. Setyo Budi S. MP
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit	3 SKS

Credit point	*3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Dasar Ilmu Tanah, Pengelolaan Tanah dan Air dan Konservasi Tanah dan Air, Kesuburan Tanah *Introduction of Soil Science, Water and Soil Management, Soil Fertility*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan tentang pengertian, ruang lingkup, kegunaan, pengembangan Teknik Analisa Laboratorium ,khususnya tanah, air, dan tanaman. Mahasiswa mampu mengidentifikasi, menganalisis, dan melakukan evaluasi terhadap Teknik Analisa Tanah, Air, tanaman, dan Pupuk Mampu menerapkan hasil kajian untuk kepentingan pertanian Mahasiswa mampu mengambil sikap untuk memutuskan teknologi Analisa Tanah, Air, tanaman, dan Pupuk yang digunakan di bidang pertanian *Students are able to explain the meaning, scope, uses and development of Laboratory Analysis Techniques, especially soil, water and plants.* *Students are able to identify, analyze and evaluate Soil, Water, Plant and Fertilizer Analysis Techniques. Able to apply study results for agricultural purposes* *Students are able to take a stance in deciding on Soil, Water, Plant and Fertilizer Analysis technology used in the agricultural sector*	CPL-2, CPL-3 CPL-3 CPL-9 *PLO-2, PLO-3* *PLO-4* *PLO-9*
Isi ***Content***	Mata kuliah ini memberikan bekal kepada mahasiswatentang pengertian, ruang lingkup, kegunaan dan pengembangan teknologi Analisa Tanah, Air, tanaman, dan Pupuk. Teknik Analisa laboratorium untuk tanah dan tanaman sebagai bekal mahasiswa untuk penelitian. Analisa tanah meliputi ciri kimia, fisik, dan biologi. Analisa tanaman meliputi kadar unsur di dalam jaringan tanaman. *This course provides students with the understanding, scope, use and development of Soil, Water, Plant and Fertilizer Analysis technology. Laboratory analysis techniques for soil and plants as student preparation for research. Soil analysis includes chemical, physical and biological characteristics. Plant analysis includes element levels in plant tissue.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%	

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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Daftar bacaan ***Reading list***	1. Moorman, T. B. (2018). Pesticide degradation by soil microorganisms: environmental. Ecological. And management effects. In *Soil biology* (pp. 121-153). CRC Press. 2. Pane, K. N., Walida, H., Saragih, S. H. Y., & Dalimunthe, B. A. (2023). Analisis karakteristik sifat biologi tanah ultisol setelah di inkubasi dengan kompos limbah buah dan sayuran. *Jurnal Al Ulum LPPM Universitas Al Washliyah Medan*, *11*(2), 85-90. 3. Paul, E., & Frey, S. (Eds.). (2024). *Soil microbiology, ecology and biochemistry*. Elsevier. 4. Susanti, R., Afriani, A., & Harahap, F. S. (2019). 34 Aplikasi Mikoriza dan Beberapa Varietas Kacang Tanah Dengan Pengolahan Tanah Konservasi terhadap Perubahan sifat Biologi Tanah. *Jurnal Pertanian Tropik*, *6*(1), 34-42.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Biologi Molekuler *Molecular Biology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191204 *PG 191204*
Kursus (jika ada) ***Course (if applicable)***	Biologi Molekuler *Molecular Biology*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Sukendah, MP
Pengajar ***Lecturer***	Dr. Ir. Sukendah, MP Dr. Ir. Makhziah, MP Saefurrohman, SP, M.Sc
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomi Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credit or 4.8 ECTS*

Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Genetika Pertanian, Bioteknologi Pertanian *Agricultural Genetics, Agricultural Biotechnology*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu bertanggung jawab terhadap tiap hasil percobaan praktikum yang dilakukan secara mandiri maupun kelompok di laboratorium. Mahasiswa mampu menguasai seluruh konsep dan teori biomolekuler, serta menerapkan ilmu biomolekuler yang telah didapatkan di bidang keahliannya terutama yang berkaitan langsung dengan kompetensi yang diharapkan oleh stakeholder di dunia kerja. Mahasiswa mampu menganalisis dan menginterpretasi peristiwa alami biomolekuler yang umumnya terjadi pada sel tanaman. Mahasiswa mampu membuat dan mempublikasikan dokumen atau laporan ilmiah di bidang pertanian yang berkaitan dengan ilmu biomolekuler. *Students are able to be responsible for the results of each practical experiment carried out independently or in groups in the laboratory.* *Students are able to master all biomolecular concepts and theories, as well as apply the biomolecular knowledge they have acquired in their field of expertise, especially those directly related to the competencies expected by stakeholders in the world of work.* *Students are able to analyze and interpret natural biomolecular events that generally occur in plant cells.* *Students are able to create and publish scientific documents or reports in the field of agriculture related to biomolecular science.*	CPL-2 CPL-4, CPL-5 CPL-5, CPl-6 CPL-12 *PLO-2* *PLO-4, PLO5* *PLO-5, PLO,6 PLO-12*
Isi ***Content***	Pada mata kuliah ini akan dibahas pengertian dasar dan sejarah biologi molekuler serta aktivitas molekuler yang terjadi pada sel organisme baik prokaryot maupun eukaryot. Fokus pembahasan diarahkan pada proses metabolik sel yang melibatkan ekspresi genetik dari mulai transkripsi sampai translasi baik menyangkut komponen dan elemen-elemen yang terlibat dalam kegiatan tersebut, maupun mekanisme-mekanisme yang terjadi serta peluang modifikasi-modifikasi yang kemungkinan dapat terjadi dalam proses tersebut. Untuk tujuan pembahasan tersebut secara detail akan diberikan tentang: batasan gen dan genom, dogma genetik, perbedaan struktur dan organisasi gen pada prokariotik dan eukariotik; pengemasan DNA; konsep replikon dan replikasi DNA; mutasi dan reparasi DNA; transkripsi pada prokariotik dan eukariotik; pengendalian transkripsi, translasi dan protein target. Untuk menambah wawasan sesuai dengan perkembangan kemajuan teknologi mutakhir, maka dibahas tentang aplikasi biologi molekuler di bidang pertanian. *This course will discuss the basic understanding and history of molecular biology and molecular activities that occur in cells of organisms both prokaryotes and eukaryotes. The focus of the discussion is directed at the*	

<table>
<tr><td></td><td>metabolic processes of cells involving genetic expression from transcription to translation, both concerning the components and elements involved from transcription to translation, both regarding the components and elements involved in these activities, as well as the mechanisms involved in these activities. the components and elements involved in these activities, as well as the mechanisms that occur and the opportunities for modifications that may occur in the process. may occur in the process. For the purpose of this discussion details will be given about: the boundaries of genes and genomes, genetic dogma, differences in the structure and organization of genes in prokaryotic and organization of genes in prokaryotic and eukaryotic; DNA packaging; the concept of replicon and DNA replication; mutation and DNA repair. DNA replication; DNA mutation and repair; transcription in prokaryotic and eukaryotic; control of transcription, translation and target proteins transcription, translation and target proteins. To add insight in accordance with development of the latest technological advances, the application of molecular biology in agriculture is discussed. agriculture.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>1. O. Brandenberg et al. 2011. Introduction to Molecular Biology and Genetic Engineering. Food Agriculture Organization of United Nations. Rome.
2. N. Steward Jr (Ed.). 2008. Plant Biotechnology and Genetics: Principles, Techniques, and Applications. Wiley and Sons, Inc.
3. Yuwono, T. 2006. Bioteknologi Pertanian. Gadjah Mada Press, Yogyakarta, Indonesia.
4. R. F. Weaver. 2011. Molecular Biology (fifth edition). The Mc Graw Hill. 914 pp.
5. J. M. Walker and R. Raply. 2009. Molecular Biology and Biotechnology (fifth edition).Royal Society of Chemistry. 624 pp.
6. M. A. Adem. 2006. Molecular Biology and Applied Genetics. Jimma University. 715 pp.</td></tr>
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	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Manajemen Pembibitan *Plant Nursery Management*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191207 *PG191207*
Kursus (jika ada) ***Course (if applicable)***	Manajemen Pembibitan *Plant Nursery Management*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Ida Retno M., M.P.
Pengajar ***Lecturer***	Dr. Ir. Ida Retno M., M.P. Nova Triani, S.P., M.P.
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomi Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credits or 3.2 ECTS*
Persyaratan sesuai ketentuanujian	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

<table>
<tr><td>Requirements according to theexamination regulations</td><td colspan="2"></td></tr>
<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td colspan="2">-</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and theircorresponding PLOs</td><td>Mahasiswa mampu menjelaskan faktor pendukung perbanyakan tanaman, tahap pra pembibitan, dan tahap pembibitan utama.
Mahasiswa mampu menguraikan aspek-aspek manajemen yang berkaitan dengan perbanyakan tanaman.
Mahasiswa mampu memproduksi bibit tanaman dan menunjukkan kemahirannya.

Students capable to explain the supporting factors for plant propagation, the pre-nursery stage, and the main nursery stage.
Students are capable of elaborating on the management aspects related to plant propagation.
Students are capable of producing plant seedlings and demonstrating their proficiency.</td><td>CPL-4

CPL-5

CPL-8

PLO 4

PLO 5

PLO 8</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Mata kuliah ini memberikan penjelasan mengenai pembibitan dan perbanyakan, faktor internal dan eksternal yang mendukung perbanyakan tanaman, tahap pra pembibitan, tahap pembibitan utama, pengelolaan keuangan dan pemasaran dalam perbanyakan tanaman, pengelolaan dan pemeliharaan pohon induk, prinsip kesehatan kerja dan penerapan keselamatan (K3), dan tahapan manajemen dan teknologi dalam produksi bibit tanaman.

This course provides an explanation of seedlings and propagation, internal and external factors that support plant propagation, the pre-nursery stage, the main nursery stage, financial management and marketing in plant propagation, management and maintenance of parent trees, principles of occupational health and safety (K3) implementation, and stages of management and technology in plant seedling production.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td colspan="2">Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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<tr><td></td><td></td><td></td><td>0 - < 42</td><td>E</td><td>0.00</td></tr>
</table></td></tr>
<tr><td>Media yang digunakan</td><td colspan="2">Hardwares : Projector and screensr, reference book, sound system</td></tr>
</table>

Media employed	Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Daftar bacaan ***Reading list***	1. Prasetyo, Bilman W. Simanihuruk, dan Zafanya M. Geofanny. 2022. Pertumbuhan Bibit Kelapa Sawit (Elaeis Guineensis Jacq.) Tahap Main Nursery Pada Berbagai Campuran Media Tanam. Seminar Nasional Pertanian Pesisir Vol. 1 No.1. 2. Laras, Febi. 2021. The Application of Chicken Manure to The Efficiency of NPK Usage on Oilpalm Growth (Elaeis guineensis Jacq.) in Main Nursery. Thesis. Agronomy Study Program. Sriwijaya University. 3. Triani, Nova. 2021. Sosialisasi dan Pelatihan Penerapan Prinsip Keselamatan dan Kesehatan Kerja (K3) pada Petani Cengkeh di Bone dan Bulukumba Sulawesi Selatan. Diklat Review: Jurnal Manajemen Pendidikan dan Pelatihan. Vol. 5. No.1. 4. Sulistyanto, Ari., Dwinarko, Tabrani Sjafrizal, Saeful Mujab. 2020. Strategi Komunikasi Pemasaran Produksi Pertanian Jamur Tiram Pada Kelompok Tani "Anugerah Makmur" di Dusun Cibuerium, Serangpanjang, Kabupaten Subang. INTELEKTIVA : Jurnal Ekonomi, Sosial & Humaniora. Vol.01 No. 11. Juni

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Ilmu Hama dan Penyakit Tanaman *Plant Pest and Disease*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191226 *PG 191226*
Kursus (jika ada) ***Course (if applicable)***	Ilmu Hama dan Penyakit Tanaman *Plant Pest and Disease*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for theModule***	Dr. Ir. Tri Mujoko, MP.
Pengajar ***Lecturer***	Dr. Ir. Tri Mujoko, MP. Dr. Ir. Yenny Wuryandari, MP. Prof. Dr. Ir. Moch. Sodiq Dita Megasari, SP. MSi.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*

Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Dasar Perlindungan Tanaman *Basic of Plant Protection*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and theircorresponding PLOs***	Mahasiswa mampu memahami konsep penyakit tanaman Mahasiswa mampu mendiagnosa penyakit tumbuhan Mahasiswa mampu mengidentifikasi faktor-faktor biotik dan abiotik hama Mahasiswa mampu menerapkan PHT *Students are able to understand the concept of plant disease* *Students are able to diagnose plant diseases* *Students are able to identify biotic and abiotic factors of pests* *Students are able to apply IPM*	CPL-4 CPL-4 CPL-4 CPL-5 *PLO-4* *PLO-4* *PLO-4* *PLO-5*
Isi ***Content***	1. Konsep terjadinya penyakit 2. Diagnosa penyakit tumbuhan 3. Pengaruh patogen terhadap fisiologi tanaman 4. Penghitungan intensitas penyakit 5. Pengertian dan batasan hama tanaman 6. Cara penentuan ambang ekonomi. 7. Faktor-faktor biotik dan abiotik yang mempengaruhi perkembangan populasi hama dan kerusakan yang diakibatkannya 8. Bentuk hubungan timbal balik serangga dan tumbuhan. 9. Metode *rearing* 10. Konsep, prinsip, dan penerapan PHT (Pengendalian Hama Terpadu) 1. *The concept of disease occurrence* 2. *Diagnose plant diseases* 3. *The influence of pathogens on plant physiology* 4. *Calculation of disease intensity* 5. *Definition and limitations of plant pests* 6. *How to determine the economic threshold.* 7. *Biotic and abiotic factors that influence the development of pest populations and the damage they cause* 8. *Form a reciprocal relationship between insects and plants.* 9. *Rearing method.* 10. *Concepts, principles and application of IPM (Integrated Pest Management)*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30%	

<table>
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● Practice 20%
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<tr><td>Daftar bacaan
Reading list</td><td>

1. Anderson, T. E. 2021. Advances in Insect Rearing for Research and Pest Management. United States: CRC Press.
2. Freer-Smith, P. H., & Webber, J. F. (2017). Tree pests and diseases: the threat to biodiversity and the delivery of ecosystem services. *Biodiversity and Conservation*, *26*(13), 3167-3181.
3. Rahmiah, et. al., Pengendalian Hama dan Penyakit Tanaman. 2021.Indonesia (ID): Yayasan Kita Menulis.
4. Megesari, R., & Nuryadi, M. (2019). Inventarisasi Hama Dan Penyakit Tanaman Jagung (Zea mays L.) dan Pengendaliannya. *Musamus Journal of Agrotechnology Research*, *2*(1), 1-12.
5. Secretariat, I. P. P. C., Gullino, M. L., Albajes, R., Al-Jboory, I., Angelotti, F., Chakraborty, S., ... & Stephenson, T. (2021). *Scientific review of the impact of climate change on plant pests*. FAO on behalf of the IPPC Secretariat.

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

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Peramalan Hama dan Penyakit Tanaman *Plant Pest Forecasting and Disease*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191229 *PG 191229*
Kursus (jika ada) ***Course (if applicable)***	Peramalan Hama dan Penyakit Tanaman *Plant Pest Forecasting and Disease*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Herry Nirwanto, MP.
Pengajar ***Lecturer***	Dr. Ir. Herry Nirwanto, MP. Dr. Ir. Sri Wiyatiningsih, MP. Dr. Ir. Wiwin Windriyanti, MP. Ramadhani Mahendra Kusuma, SP., MP., M.Sc.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credits or 3,2 ECTS*
Persyaratan sesuai ketentuanujian	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Requirements according to theexamination regulations		
Prasyarat wajib ***Mandatory prerequisites***	Dasar Perlindungan Tanaman *Basic of Plant Protection*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menunjukkan sikap bertanggungjawab atas pekerjaan di bidang keahliannya secara mandiri. Mahasiswa mampu mendiagnosa, menganalisis dan menyelesaikan permasalahan hama penyakit tanaman. Mahasiswa mampu menguasai prinsip dan isu terkini tentang pertanian dataran rendah dan permasalahan lingkungannya Mahasiswa mampu menguasai teknologi dan mampu mengkomunikasikan dengan masyarakat dalam menyelesaikan permasalahan pertanian baik lisan maupun tulisan. *Student capable to think critically and analytically, solve problems, be responsible for work independently, and make appropriate decisions based on information that can be accounted.* *Student capable to apply knowledge to identify, diagnose, analyze, plan and apply integrated pest and plant disease control.* *Student capable to manage lowland agricultural systems and related environmental issues.* *Student capable to communicate orally and in writing, work in a team, interact with other people from different backgrounds, skilled in organizing and leading in various situations.*	CPL-2 CPL-10 CPL-11 CPL-12 *PLO-2* *PLO-10* *PLO-11* *PLO-12*
Isi ***Content***	1. Konsep Dasar Perlindungan tanaman 2. Pengukuran faktor biotik dan abiotik terhadap perkembangan gejala dan kerusakan tanaman 3. Mengukur kerusakan penyakit dan kehilangan hasil 4. Perkembangan penyakit 5. Model Peramalan Penyakit 6. Model geospasial penyakit 7. Aplikasi peramalan dalam penelitian 8. Peranan serangga dalam ekologi 9. Analisa permasalahan Populasi pada Agroekosistem 10. Aplikasi Sistem Digitasi Penggunaan Database Model Matematika 11. Peramalan Hama Dalam Penelitian Hama Tanaman 1. *Basic concepts of plant protection* 2. *Measurement of biotic and abiotic factors on the development of symptoms and plant damage* 3. *Measure disease damage and yield loss* 4. *Disease progression* 5. *Disease Forecasting Model* 6. *Geospatial model of disease* 7. *Application of forecasting in research* 8. *The role of insects in ecology* 9. *Analysis of Population problems in Agroecosystems* 10. *Digitization System Applications Using Mathematical Model Databases* 11. *Pest Forecasting in Plant Pest Research*	

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Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
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Reading list</td><td>1. Bahlai, C. A. (2023). Forecasting insect dynamics in a changing world. Current Opinion in Insect Science, 101133.
2. Cindowarni, O., Siska, F., Dianarafah, D., Lamdo, H., & Purwanto, B. (2023). Inventarisasi hama dan penyakit penting pada tanaman cabai rawit di kebun percobaan politeknik negeri lampung. Anfatama: Jurnal Pengabdian Masyarakat, 2(3), 20-30.
3. Ibrahim, E. A., Salifu, D., Mwalili, S., Dubois, T., Collins, R., & Tonnang, H. E. (2022). An expert system for insect pest population dynamics prediction. Computers and Electronics in Agriculture, 198, 107124.
4. Prasad, T. V., & Rao, M. S. (2022). Pest Survey and Surveillance for Pest Forecasting and Pest Management. Adaptation Strategies for Pest Management in Climate Change Scenarios, 43.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Biologi Tanah *Soil Biology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191215 *PG 191215*
Kursus (jika ada) ***Course (if applicable)***	Biologi Tanah *Soil Biology*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for theModule***	Dr. Ir. Rossyda Priyadarshini, MP.
Pengajar ***Lecturer***	Dr. Ir. Rossyda Priyadarshini, MP. Dr.Ir. Moch Arifin, MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credits or 3.2 ECTS*
Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*
Prasyarat wajib ***Mandatory prerequisites***	Dasar Ilmu Tanah *Basic of Soil Science*

Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu berpikir kritis dan analitis, memecahkan masalah, bertanggung jawab dalam pekerjaan secara mandiri, dan mengambil keputusan yang tepat berdasarkan informasi yang dapat dipertanggungjawabkan.	CPL-2
	Mahasiswa mampu menganalisis, merencanakan dan melaksanakan sistem pertanian dataran rendah yang mengacu pada prinsip-prinsip pertanian berkelanjutan, baik kearifan modern maupun lokal, secara efektif dan produktif	CPL-6
	Mahasiswa mampu menerapkan pengetahuan dalam mengidentifikasi, merumuskan, menganalisis, merencanakan dan menerapkan pengelolaan sumber daya lahan	CPL-9
	Mahasiswa mampu berkomunikasi lisan dan tulisan, bekerja dalam tim, berinteraksi dengan orang lain dari latar belakang berbeda, terampil berorganisasi dan memimpin dalam berbagai situasi.	CPL-12
	Student capable to think critically and analytically, solve problems, be responsible for work independently, and make appropriate decisions based on information that can be accounted	*PLO-2*
	Student capable to analyze, plan and implement lowland agricultural systems referring to the principles of sustainable agriculture, both modern and local wisdom, effectively and productively	*PLO-6*
	Student capable to apply knowledge of identifying, formulating, analyzing, planning and applying land resource management	*PLO-9*
	Student capable to communicate orally and in writing, work in a team, interact with other people from different backgrounds, skilled in organizing and leading in various situations.	*PLO-12*
Isi ***Content***	Materi kuliah Biologi Tanah memuat tentang tanah sebagai laboratorium hidup dan seluruh komunitas yang menghuninya, konsep dan prinsip dasar biologi tanah dan mikrobiologi tanah. Peran biota tanah dalam menyediakan unsur hara dan penguraian bahan organik, serta mekanismenya; komunitas rizosfer dan mikroba serta eksudat dan produk yang dihasilkan; mikoriza (ciri dan jenisnya) serta peranannya dalam menyediakan unsur hara dan ekosistem. Mahasiswa juga dibekali pengetahuan dasar tentang pemanfaatan genetika dan bioteknologi mikroba dalam bidang pertanian. Sebagai ciri khasnya, mahasiswa akan dibekali pengetahuan mengenai aktivitas organisme tanah khususnya di wilayah pesisir dan dataran rendah. Siswa diharapkan mampu memahami pemanfaatan biota tanah baik mikro, meso maupun makro untuk perbaikan lahan. *Soil Biology course material contains soil as a living laboratory and all the communities that live in it, basic concepts and principles in soil biology and soil microbiology. The role of soil biota in providing nutrients*	

	and decomposition of organic matter, and its mechanisms; the rhizosphere and microbial communities as well as the resulting exudates and products; mycorrhiza (characteristics and types) and their role in providing nutrients and ecosystems. Students are also provided with basic knowledge about the use of genetics and microbial biotechnology in agriculture. As a special characteristic, students will be equipped with knowledge regarding the activities of soil organisms, especially in coastal and lowland areas. Students are expected to be able to understand the use of soil biota, both micro, meso and macro for land improvement.
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%

Final Grade	Letter Grade	Grade Point	Final Grade	Letter Grade	Grade Point
≥ 80 – 100	A	4.00	≥ 58 – <64	C+	2.50
≥ 76 – <80	A-	3.75	≥ 54 – <58	C	2.00
≥ 72 – <76	B+	3.50	≥ 50 – <54	C-	1.75
≥ 68 – <72	B	3.00	≥ 46 –<50	D+	1.50
≥ 64 – <68	B-	2.75	≥ 42 – <46	D	1.00
			0 - < 42	E	0.00

Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Daftar bacaan ***Reading list***	1. Moorman, T. B. (2018). Pesticide degradation by soil microorganisms: environmental. Ecological. And management effects. In *Soil biology* (pp. 121-153). CRC Press. 2. Pane, K. N., Walida, H., Saragih, S. H. Y., & Dalimunthe, B. A. (2023). Analisis karakteristik sifat biologi tanah ultisol setelah di inkubasi dengan kompos limbah buah dan sayuran. *Jurnal AI Ulum LPPM Universitas AI Washliyah Medan*, *11*(2), 85-90. 3. Paul, E., & Frey, S. (Eds.). (2024). *Soil microbiology, ecology and biochemistry*. Elsevier. 4. Susanti, R., Afriani, A., & Harahap, F. S. (2019). 34 Aplikasi Mikoriza dan Beberapa Varietas Kacang Tanah Dengan Pengolahan Tanah Konservasi terhadap Perubahan sifat Biologi Tanah. *Jurnal Pertanian Tropik*, *6*(1), 34-42.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Metode Penelitian Agroteknologi *Agrotechnology Research Methods*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191121 *PG191121*
Kursus (jika ada) ***Course (if applicable)***	Metode Penelitian Agroteknologi *Agrotechnology Research Methods*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Prof. Dr. Ir. Juli Santoso, MP
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agroteknologi Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Agrotechnology* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu*
Angka kredit ***Credit point***	*3 SKS* *3 credits or 4.8 ETCS*
Persyaratan sesuai ketentuanujian	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Requirements according to theexamination regulations		
Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu merancang penelitian dengan berdasarkan pemecahan masalah melalui rumusan langkah-langkah yang benar dan konsep yang tepat untuk tujuan penyusunan tugas akhir. Mahasiswa mampu menyusun proposal penelitian sesuai dengan kaidah ilmiah dan menggunakan rancangan percobaan yang tepat untuk memperoleh hasil berupa data kuantitatif maupun kuantitatif. Mahasiswa mampu menganalisis, menginterpretasi dan mengevaluasi hasil data yang diperoleh dari hasil percobaan yang telah dilakukan dan mampu mengambil keputusan dalam mendeskripsikan data. Mahasiswa mampu menyusun laporan hasil penelitian yang ditulis dalam bentuk format tugas akhir/skripsi dan menghasilkan luaran dan mempresentasikan hasil penelitian dalam berbagai bentuk publikasi. *Students are capable to designing research based on problem-solving through the formulation of correct steps and appropriate concepts for the purpose of preparing a final assignment.* *Students are capable to preparing research proposals in accordance with scientific principles and using appropriate experimental designs to obtain results in the form of quantitative and quantitative data.* *Students capable of analyzing, interpreting, and evaluating data results obtained from the results of experiments that have been carried out and capable of making decisions in describing the data.* *Students capable of preparing research reports written in the form of a final assignment/thesis format and producing output and presenting research results in various forms of publication.*	CPL-4 CPL-4 CPL-7 CPL-12 *PLO-4* *PLO-4* *PLO-7* *PLO-12*
Isi ***Content***	Mata kuliah yang mempelajari dasar-dasar penelitian ilmiah agroteknologi, ragam penelitian ilmiah, penyusunan karya ilmiah yang meliputi: rumusan masalah, tujuan (luaran), manfaat (timbal balik), hipotesis dan novelti penelitian, landasan analitis pustaka dan kerangka penelitian, materi dan metode penelitian, pelaksanaan penelitian; perencanaan, pengumpulan, penyajian dan analisis data; pembahasan dan penyimpulan; dan teknik dasar presentasi ilmiah dalam bentuk oral maupun poster. *These courses study the basics of agrotechnology scientific research, various scientific research, and preparation of scientific work which includes: problem formulation, objectives (outputs), benefits (reciprocity), research hypotheses and novelties, analytical foundations of literature, and research frameworks, materials and methods research, conducting research; planning, collecting,*	

<table>
<tr><td></td><td>presenting and analyzing data; discussion and conclusions; and basic techniques for scientific presentations in oral and poster form.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%
<table>
<tr><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th></tr>
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Media employed</td><td>Hardwares : Projector and screensr, reference book, sound system
Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>1. Abubakar, H. R. I. 2021. Pengantar metodologi penelitian. SUKA-Press UIN Sunan Kalijaga.
2. Firmansyah, D. 2022. Teknik Pengambilan Sampel Umum dalam Metodologi Penelitian: Literature Review. Jurnal Ilmiah Pendidikan Holistik (JIPH), 1(2): 85-114.
3. Harmoko, M. P., Kilwalaga, I., Pd, S. P. I., Asnah, S. P., Rahmi, S., Adoe, V. S., ... & Arina, F. 2022. Buku ajar metodologi penelitian. Feniks Muda Sejahtera.
4. Prasetio, A., Pakpahan, A. F., Sesilia, A. P., Purba, B., Negara, E. S., Rantung, G. A. J. & Siagian, V. 2021. Metodologi Penelitian Ilmiah.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Survei dan Evaluasi Lahan *Land Survey and Evaluation*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191216 *PG191216*
Kursus (jika ada) ***Course (if applicable)***	Survei dan Evaluasi Lahan *Land Survey and Evaluation*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Ir. Purnomo Edi S. MP.
Pengajar ***Lecturer***	Ir. Purnomo Edi S., MP. Dr.Ir. Maroeto, MP. Ir. Purwadi, MP. Dr.Ir. Moch. Arifin, MT.
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Wajib *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Compulsory*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit	3 SKS

Credit point	*3 credit or 4.8 ECTS*	
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Genetika Pertanian, Bioteknologi Pertanian *Agricultural Genetics, Agricultural Biotechnology*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan tentang pengertian, ruang lingkup, kegunaan, pengembangan survei tanah & evaluasi lahan. Mahasiswa mampu memahami dan menjelaskan tentang Prinsip & Metode Survai Tanah, Organisasi Pra Survai Tanah & Survai Tanah. Mahasiswa mampu menerapkan proses perencanaan dan pelaksanaan survai tanah. Mahasiswa mampu memahami dan menjelaskan tentang Evaluasi Lahan, Evaluasi Kemampuan Lahan, Evaluasi Kesesuaian Lahan, Evaluasi Kemampuan Kesuburan Tanah Mahasiswa mampu mengidentifikasi, menganalisis, dan melakukan evaluasi kemampuan lahan/Kesesuian lahan/Kemampuan kesuburan tanah . *Student capable to explain the meaning, scope, uses, development of land surveying & evaluation land.* *Student capable to understand and explain Land Survey Principles & Methods, Pre-Land Survey Organization & Land Survey.* *Student capable to apply the process of planning and implementing land surveys.* *Student capable to understand and explain Land Evaluation, Land Capability Evaluation, Evaluation Land Suitability, Evaluation of Soil Fertility Capability.* *Student capable to identify, analyze and evaluate land capability/suitability land/Soil fertility capabilities.*	CPL -2 CPL-3 CPL -4 CPL -4 CPL -4, CPL -9 *PLO-2* *PLO-3* *PLO-4* *PLO-4* *PLO-4 PLO-9*
Isi ***Content***	Pengertian, ruang lingkup, kegunaan, dan pengembangan survei tanah dan evaluasi lahan dalam bidang pertanian maupun pengelolaan sumberdaya lahan dan lingkungan. Prinsip dan metodologi survei tanah meliputi deskripsi, klasifikasi dan pemetaan serta persiapan, pelaksanaan, pengolahan dan interpretasi data. Berbagai pendekatan dalam Evaluasi Lahan; Klasifikasi kemampuan Lahan, Klasifikasi kesesuaian lahan untuk tipe penggunaan lahan tertentu (Pertanian, Kehutanan, Perikanan dan non Pertanian), Klasifikasi Kemampuan Kesuburan Tanah (FCC), Perencanaan Tata Guna Lahan, dan Pembuatan Laporan Survei Tanah *Definition, scope, use and development of land surveying and land evaluation in the fields of agriculture and land and environmental resource management. The principles and methodology of land surveying include description, classification and mapping as well as preparation, implementation, processing and interpretation of data. Various approaches in Land Evaluation; Land*	

<table>
<tr><td></td><td>capability classification, Land suitability classification for land use types certain areas (Agriculture, Forestry, Fisheries and non-agriculture), Soil Fertility Capacity Classification (FCC), Land Use Planning, and Making Land Survey Reports.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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<tr><td>Daftar bacaan
Reading list</td><td>1. NRCS Staff. 2019. National Soil Survey Handbook. USDA NRCS. Washington DC. Soil Science Division Staff. 2017. Soil Survey Manual. Agriculture Handbook No.18. USDA NRCS. Washington DC.
2. Ridayanti, M., Rayes, M. L., & Agustina, C. 2020. Evaluasi Kesesuaian Lahan Tanaman Jagung pada Lahan Kering di Kecamatan Wagir Kabupaten Malang. J. Tanah dan Sumberd. Lahan, 8(1), 149-160.
3. Simanjuntak, J. F., Agustina, C., & Rayes, M. L. 2021. Evaluasi kesesuaian lahan untuk tanaman cabai rawit di Kecamatan Wagir, Kabupaten Malang. Jurnal Tanah dan Sumberdaya Lahan, 8(1), 259-271.
4. Sukarman, S., Mulyani, A., & Purwanto, S. 2020. Modifikasi metode evaluasi kesesuaian lahan berorientasi perubahan iklim.</td></tr>
</table>

SEMESTER 7

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Perencanaan dan Pengembangan Agribisnis *Agribusiness Planning and Development*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191235 *PG 191235*
Kursus (jika ada) ***Course (if applicable)***	Perencanaan dan Pengembangan Agribisnis *Agribusiness Planning and Development*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Ir. Hadi Suhardjono, M.TP.
Pengajar ***Lecturer***	Ir. Hadi Suhardjono, M.TP. Fadila Suryandika, STP, M.Sc Dita Megasari, SP, M.Si
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agroteknologi Jenis: Pilihan Umum *Study Program: Agrotechnology Study Program* *Specialization: Agrotechnology* *Type: General Elective Course*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 Credits or 3,2 ECTS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

<table>
<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td colspan="2">-</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mahasiswa mampu menguasai fungsi dan proses perencanaan dan pengembangan agribisnis.
Mahasiswa mampu menguasai prinsip perencanaan dan pengembangan usaha agribisnis.
Mahasiswa mampu merencanakan suatu jenis usaha, teknologi, sarana produksi dan mempersiapkan sumber daya secara profesional.

Students capable to master the functions and processes of agribusiness planning and development
Students capable to master the principles of planning and developing agribusiness businesses
Students capable to plan a type of business, technology, production facilities and prepare resources professionally.</td><td>CPL-4

CPL-4

CPL-7

PLO-4

PLO-4

PLO-7</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Prinsip-prinsip perencanaan dan pengembangan agribisnis, Menentukan lokasi usaha agribisnis, Menentukan jenis usaha sesuai komoditas pilihan, Menentukan teknologi proses produksi agribisnis, Menentukan sarana produksi dan sumber daya, Identifikasi kelembagaan pendukung agribisnis, Menyusun perencanaan dan pengembangan agribisnis.

Principles of agribusiness planning and development, Determining the location of the agribusiness business, Determining the type of business according to the selected commodity, Determining the agribusiness production process technology, Determining production facilities and resources, Identifying agribusiness supporting institutions, Developing agribusiness planning and development.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td colspan="2">Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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Daftar bacaan ***Reading list***	1. Afriansyah, Sari Anggarawati, Agatha Wahyu Widati, Elsa Christin Saragih, Arifah Qurrotu Aina, Yusmia Widiastuti, Rusydi Fauzan, Umi Yuminarti, Abdurohim, Ratmi Rosilawati. (2023). *Perencanaan Agribisnis Pertanian Berkelanjutan*. (n.p.): Global Eksekutif Teknologi. 2. John E.H.J. FoEh. (2020). *Perencanaan Bisnis (Business Plan): Aplikasi Dalam Bidang Sumberdaya Alam*. (n.p.): Deepublish. 3. Adi Sutanto. (2022). *Strategi Mengembangkan Agribisnis Dengan Canvas Model.* (n.p.): UMMPress.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Komunikasi Pertanian *Agricultural Extension*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191123 *PG 191123*
Kursus (jika ada) ***Course (if applicable)***	Komunikasi Pertanian *Agriculture Extension*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Mubarokah, M.TP
Pengajar ***Lecturer***	Dr. Ir. Mubarokah, M.TP Dr. Ida Syamsu Roidah, SP., MP Dr. Ir. Taufik Setyadi, MP Nisa Hafi Idhoh Fitriana, SP., MP
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agroteknologi Jenis: Pilihan Umum *Study Program: Agrotechnology Study Program* *Specialization: Agrotechnology* *Type: General Elective Course*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 Credits or 3,2 ECTS*

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Requirements according to the examination regulations</td><td>Mahasiswa harus menghadiri 75% perkuliahan
Students must attend 75% of lectures</td></tr>
<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td>-</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mahasiswa memahami mengenai kominakasi pertanian dan unsur-unsur komunikasi pertanian — CPL-4
Mampu merencanakan komunikasi, dimensi dan hierarki dampak komunikasi — CPL-4
Mahasiswa mampu melaksanakan penyuluhan pertanian — CPL-5

Students understand agricultural communication and the elements of agricultural communication — PLO-4
Able to plan communication, dimensions and hierarchy of communication impact — PLO-4
Students are able to carry out agricultural counseling — PLO-5</td></tr>
<tr><td>Isi
Content</td><td>Mata kuliah ini meliputi: pengenalan komunikasi dan komunikasi pertanian, unsur-unsur komunikasi, proses komunikasi, perencanaan komunikasi, dimensi dan hierarki dampak komunikasi, unsur-unsur penyuluhan pertanian, komunikasi, difusi inovasi dan adopsi inovasi, program penyuluhan pertanian.

This course includes: introduction to agricultural communication and communication, elements of communication, communication process, communication planning, dimensions and hierarchy of communication effects, elements of agricultural extension, communication, diffusion of innovation and adoption of innovation, agricultural extension program.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
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Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.</td></tr>
</table>

Daftar bacaan ***Reading list***	1. Pintakami, L. B. (2021). *Dasar-Dasar Komunikasi untuk Penyuluhan Pertanian*. Universitas Brawijaya Press. 2. Reny Sukmawani, S. P., & MP, C. (2022). K*omunikasi & penyuluhan pertanian*. cv. azka pustaka. 3. Romadi, U., & Warnaen, A. (2021). S*istem penyuluhan pertanian "Suatu Pendekatan Penyuluhan Pertanian Berbasis Modal Sosial Pada Masyarakat Suku Tengger"* (Vol. 1). Tohar Media. 4. Vintarno, J., Sugandi, Y. S., & Adiwisastra, J. (2019). Perkembangan penyuluhan pertanian dalam mendukung pertumbuhan pertanian di Indonesia. *Responsive*, *1*(3), 90-96.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Agrohidrologi *Agrohidrology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	ETKK 311 *ETKK 311*
Kursus (jika ada) ***Course (if applicable)***	Agrohidrologi *Agrohidrology*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Ir. Siswanto, M.T.
Pengajar ***Lecturer***	Dr. Ir. Bakti Wisnu Wijayani, M.P. Ir. Purwadi, M.P.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 Credits or 3.2 ECTS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Prasyarat wajib ***Mandatory prerequisites***	FP-191107 Dasar Ilmu Tanah *Fundamentals of Soil Science* MKK 3301 Sistem Informasi Geografis *Geographyc Information System*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan siklus hidrologi secara urut beserta komponen-komponennya dengan penuh keyakinan. Mahasiswa mempu melakukan perhitungan dan analisis hujan, infiltrasi, aliran permukaan sesuai ketentuan- ketentuan yang ada. Mahasiswa mampu untuk melaksanakan perhitungan dan analisis evapotranspirasi secara langsung dan empiris. Mahasiswa mampu menghitung dan analisis keseimbangan air tanah dan tanaman. Mahasiswa mampun mengidentifikasi dinamika air dalam tanah. Mahasiswa mampu merencanakan analisis kebutuhan air tanaman dalam kurun waktu tertentu berdasarkan pola tanam dan jadwal baik secara manual maupun *software* *Students are able to explain the hydrological cycle in sequence and its components with full confidence.* *Students are able to carry out calculations and analyzes of rain, infiltration and surface flow according to existing provisions.* *Students are able to carry out calculations and analysis of evapotranspiration directly and empirically.* *Students are able to calculate and analyze soil and plant water balance.* *Students are able to identify the dynamics of water in the soil.* *Students are able to plan an analysis of plant water needs within a certain period of time based on planting patterns and schedules both manually and using software*	CPL-1 CPL-2 CPL-5 CPL-5 CPL-2 CPL-9 *PLO-1* *PLO-2* *PLO-5* *PLO-5* *PLO-2* *PLO-9*
Isi ***Content***	Agrohidrologi merupakan pilihan yang mempelajari aspek air untuk tanaman dan lingkungan yang mempengaruhi. Tujuan mata kuliah ini adalah memberikan pengetahuan dan ketrampilan mahasiswa untuk menyelesaikan problematika air bagi tanaman. Berbekal pengetahunan dan ketrampilan ini mahasiswa dapat mengelola air untuk tanaman secara efisien. *Agrohydrology is an option that studies the aspects of water for plants and the environment it influences. The aim of this course is to provide students with the knowledge and skills to solve water problems for plants. Armed with this knowledge and skills, students can manage water for plants efficiently.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%	

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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Daftar bacaan ***Reading list***	1. Darwis, H., & Sc, M. (2018). Pengelolaan Air Tanah. Yogyakarta: Pena Indis. 2. Evans, J. G., Muddu, S., Szczykulska, M., Upadhyaya, D. B., & Pandy, D. K. (2021). Soil moisture measurement for agriculture. 3. Hasibuan, M. R. R. (2023). Inovasi teknologi irigasi dalam meningkatkan efisiensi penggunaan air dalam pertanian. 4. Sutrisno, N., & Hamdani, A. (2019). Optimalisasi pemanfaatan sumber daya air untuk meningkatkan produksi pertanian. Jurnal Sumberdaya Lahan, 13(2), 73-88. 5. Sutrisno, N., & Heryani, N. (2019). Pengembangan irigasi hemat air untuk meningkatkan produksi pertanian lahan kering beriklim kering. Jurnal sumberdaya lahan, 13(1), 17-26.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Pemuliaan Tanaman Terapan *Applied Plant Breeding*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191206 *PG191206*
Kursus (jika ada) ***Course (if applicable)***	Pemuliaan Tanaman Terapan *Applied Plant Breeding*
Semester ***Semester***	VI (Enam) *6th (Sixth)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Prof. Dr. Ir. Juli Santoso, MP
Pengajar ***Lecturer***	Prof. Dr. Ir. Juli Santoso, MP Dr. Ir. Makhziah, MP Dr. Ir. Ida Retno Moeljani, MP
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomi Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*

Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Pemuliaan Tanaman *Plant Breeding*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menjelaskan tahap-tahap pemuliaan tanaman dan persyaratan pada pelaksanaan pemuliaan tanaman. Mahasiswa mampu menjelaskan karakteristik genetik populasi bahan seleksi serta metode pelabelan. Mahasiswa mampu menjelaskan teknik-teknik pembentukan keragaman genetik populasi bahan seleksi dan pengujiannya. Mahasiswa mampu menjelaskan metode perakitan kultivar adaptif lingkungan bercekaman biotik dan/atau abiotik, serta pemuliaan partisipatif. Mahasiswa mampu menjelaskan penggunaan bioteknologi dan metode pemuliaan dalam konservasi sumber daya plasma nutfah. *Students are capable to explaining the stages of plant breeding and the requirements for implementing plant breeding.* *Students were capable to explaining the genetic characteristics of the selection material population and the labelling method.* *Students are capable to explaining techniques for forming genetic diversity in populations of selection and testing materials.* *Students are capable to explaining methods for assembling adaptive cultivars in environments subject to biotic and/or abiotic stress, as well as participatory breeding.* *Students are capable to explain the use of biotechnology and breeding methods in conserving germplasm resources.*	CPL-4 CPL-4 CPL-5 CPL05 CPL-6 *PLO-4* *PLO-4* *PLO-5* *PLO-5* *PLO-6*
Isi ***Content***	Mata kuliah ini menjelaskan metode perakitan kultivar unggul yang adaptif dan stabil secara efektif dan efisien, mencakup tahap pembentukan keragaman genetik, seleksi dan pengujiannya, teknik konservasi sumber daya plasma nutfah pemuliaan, serta pemanfaatan bioteknologi dalam pemuliaan tanaman. *This course explains methods for assembling superior cultivars that are adaptive and stable effectively and efficiently, including the stages of establishing genetic diversity, selection and testing, conservation techniques for breeding germplasm resources, as well as the use of biotechnology in plant breeding.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%	

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Reading list</td><td>1. Aristya, V. E., & Taryono, T. 2019. Pemuliaan Tanaman Partisipatif untuk Meningkatkan Peran Varietas Padi Unggul dalam Mendukung Swasembada Pangan Nasional. Agrotechnology Innovation (Agrinova), 2(1): 26-35.
2. Dini, N. A. R., Azizah, E., Samaullah, M. Y., & Susanto, U. 2023. Hubungan Kekerabatan Beberapa Varietas Unggul Terpilih Tanaman Padi (Oryza sativa L.) Berdasarkan Marka Morfologi. JURNAL AGROPLASMA, 10(1): 25-34.
3. Suaib, I. 2023. Pemuliaan Haploid Secara In Vitro Konsep Pembentukan Varietas Unggul Baru Tanaman Budidaya. Deepublish.
4. Taufiq, A., Kristiono, A., Wijanarko, A., Rahmianna, A. A., Iswanto, R., & Riyanto, S. A. 2020. Adaptabilitas varietas unggul kacang tanah pada tanah salin. Penelitian Pertanian Tanaman Pangan, 4(1): 43-51.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Biometrika *Biometrics*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191234 *PG 191234*
Kursus (jika ada) ***Course (if applicable)***	Biometrika *Biometrics*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Herry Nirwanto, MP.
Pengajar ***Lecturer***	Dr.Ir. Hery Nirwanto, MP. Dr.Ir. Arifin, MP. Dr.Ir. Tri Mujoko, MP. Saefurrahman,SP. M.Sc.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agroteknologi Jenis: Pilihan Umum *Study Program: Agrotechnology Study Program* *Specialization: Agrotechnology* *Type: General Elective Course*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 Credits or 3,2 ECTS*
Persyaratan sesuai ketentuanujian	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Requirements according to theexamination regulations		
Prasyarat wajib ***Mandatory prerequisites***	Statistika Pertanian *Agricultural Statistics*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu memelihara dan mengembangkan jejaring kerja secara kolaboratif dengan pembimbing, kolega, sejawat, baik di dalam maupun di luar lembaganya; Mahasiswa mampu menguasai prinsip-prinsip penerapan teknologi pertanian untuk menyelesaikan permasalahan di bidang pertanian; Mahasiswa mampu mengkaji implementasi penerapan sistem pertanian berkelanjutan yang memperhatikan dan menerapkan kaidah, tata cara dan etika ilmiah dalam rangka menghasilkan solusi, gagasan, dan desain. Mahasiswa mampu berkomunikasi lisan dan tulisan, bekerja dalam tim, berinteraksi dengan orang lain dari latar belakang berbeda, terampil berorganisasi dan memimpin dalam berbagai situasi. *Student capable to maintain and develop collaborative networks with mentors, colleagues, both inside and outside their respective workplace* *Student capable to apply the principles of agricultural technology to solve agricultural problems* *Student capable to study the implementation of sustainable agricultural systems that pay attention to and apply scientific principles, procedures and ethics in order to produce solutions, ideas and designs based on the results of information and data analysis* *Student capable to communicate orally and in writing, work in a team, interact with other people from different backgrounds, skilled in organizing and leading in various situations.*	CPL-3 CPL-5. CPL-7 CPL-12 *PLO-3* *PLO-5* *PLO-7* *PLO-12*
Isi ***Content***	Mata kuliah ini membahas tentang metode desain eksperimen untuk mengetahui pengaruh perlakuan dengan tingkat akurasi yang lebih rendah pada petak utama dibandingkan pada anak petak melalui Rancangan Petak Terpisah. Materi desain Desain plot strip akan mengukur interaksi antara dua faktor utama. Selain itu juga akan diberikan metode untuk mengetahui pengaruh variabel tertentu yang tidak dapat dikontrol tetapi mempunyai korelasi yang tinggi dengan variabel respon melalui analisis varians. Selanjutnya, metode untuk merancang eksperimen terfaktor dimana interaksi tidak dapat terjadi akan disediakan melalui desain tersarang. Metode statistik lain yang digunakan untuk mengetahui respon pengobatan seperti polinomial Ortogonal, Response Surface Analysis akan diberikan melalui studi kasus dan praktikum, sedangkan untuk mendapatkan model non-linier dan mengetahui hubungan antara variabel terikat dan variabel bebas akan diberikan melalui metode Non-linear. metode analisis Regresi linier, selain itu Untuk mengetahui pola hubungan pengaruh langsung dan tidak langsung dari masing-masing faktor yang diamati menggunakan Analisis Jalur. Cara mengukur pengaruh variabel independen dalam skala kategorikal terhadap beberapa variabel dependen maupun dalam skala data kuantitatif akan dibahas pada uji M anova, sedangkan dengan menggunakan Principal	

	Component Analysis (PCA) mengubah sebagian besar variabel asli yang digunakan. dan saling berkorelasi, menjadi satu kumpulan variabel baru yang lebih kecil dan independen satu sama lain (tidak berkorelasi lagi). Di akhir perkuliahan Anda akan diberikan tes Analisis Cluster yang memiliki tujuan utama untuk mengelompokkan objek berdasarkan karakteristiknya. *This course discusses experimental design methods to determine the effect of treatment with a lower level of accuracy on the main plot than on subplots through Split Plot Design. Design material Strip plot design will measure the interaction between two main factors. Besides that, a method will be given to determine the influence of certain variables that cannot be controlled but are highly correlated with the response variable through variance analysis. Furthermore, the method for designing factored experiments where interaction cannot occur will be provided through a nested design. Other statistical methods used to determine treatment responses such as Orthogonal polynomials, Response Surface Analysis will be provided through case studies and practicums, while to obtain non-linear models and find out the relationship between dependent variables and independent variables will be provided through the Non-linear Regression analysis method, besides that To find out the relationship pattern of direct and indirect influence of each observed factor using Path Analysis. The method for measuring the influence of independent variables on a categorical scale on several dependent variables as well as those on a quantitative data scale will be discussed in the M anova test, while using Principal Component Analysis (PCA) changes most of the original variables used and are correlated with each other, into one a new set of variables that are smaller and independent of each other (no longer correlated). At the end of the lecture you will be given a Cluster Analysis test which has the main aim of grouping objects based on their characteristics.*
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20% (see table below)
Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.

Final Grade	Letter Grade	Grade Point	Final Grade	Letter Grade	Grade Point
≥ 80 – 100	A	4.00	≥ 58 – <64	C+	2.50
≥ 76 – <80	A-	3.75	≥ 54 – <58	C	2.00
≥ 72 – <76	B+	3.50	≥ 50 – <54	C-	1.75
≥ 68 – <72	B	3.00	≥ 46 –<50	D+	1.50
≥ 64 – <68	B-	2.75	≥ 42 – <46	D	1.00
			0 - < 42	E	0.00

Daftar bacaan ***Reading list***	1. Bender, F. E. (2020). *Statistical methods for food and agriculture*. CRC Press. 2. Lamour, J., Naud, O., Lechaudel, M., Le Moguédec, G., Taylor, J., & Tisseyre, B. (2020). Spatial analysis and mapping of banana crop properties: issues of the asynchronicity of the banana production and proposition of a statistical method to take it into account. *Precision Agriculture*, *21*, 897-921. 3. Massart, S., Lebas, B., Chabirand, A., Chappé, A. M., Dreo, T., Faggioli, F., & Brostaux, Y. (2022). Guidelines for improving statistical analyses of validation datasets for plant pest diagnostic tests. *EPPO Bulletin*, *52*(2), 419-433. 4. Ribeiro, K., Santos, R., Saraiva, E., & Rajagopal, R. (2021). A statistical methodology to estimate soiling losses on photovoltaic solar plants. *Journal of Solar Energy Engineering*, *143*(6), 064501.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Produksi Pertanian Terapan (Crop Production) *Applied Agricultural Production Technology (Crop Production)*
Level modul ***Module level***	Sarjana *Bachelor Degree / Undergraduate*
Kode ***Code***	PG141203 *PG141203*
Kursus (jika ada) ***Course (if applicable)***	Produksi Tanaman *Crop Production*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Nora Augustien K.,MP.
Pengajar ***Lecturer***	Dr. Ir. Nora Augustien K., MP. Dr. Ir. Ramdan Hidayat, MS. Dr. Dra. Sutini, M.Pd. Puji Lestari Tarigan, S.P., M.Sc.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomi Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok 3. Praktikum 100 menit/pertemuan (12 pertemuan) *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*

Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*	
Persyaratan sesuai ketentuanujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Dasar Budidaya Tanaman *Basic of Plant Cultivation*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menguasai prinsip-prinsip penerapan teknologi pertanian untuk memecahkan masalah di bidang pertanian Mahasiswa mampu menguasai teknologi perbanyakan tanaman, dan pengelolaan tanaman sesuai dengan zona agroklimat Mahasiswa mampu menguasai teknologi dan mampu mengkomunikasikan dengan masyarakat dalam menyelesaikan permasalahan pertanian baik lisan maupun tulisan *Student capable to apply the principles of agricultural technology to solve agricultural problems* *Student capable to apply the knowledge of plant propagation technology, and crop management in accordance with the agroclimate zone* *Student capable to communicate orally and in writing, work in a team, interact with other people from different backgrounds, skilled in organizing and leading in various situations*	CPL- 5 CPL-8 CPL-12 *PLO-5* *PLO-8* *PLO-12*
Isi ***Content***	Fisiologi dan Model Pertumbuhan, Perkembangan Tanaman, Fisiologi Perkecambahan dan Dormansi, Fisiologi Pertumbuhan Vegetatif dan Generatif, Pembentukan dan Pemangkasan Pohon, Hubungan dan Imbangan Source dan Sink terhadap pertumbuhan vegetatif dan generatif, Karakter produk dan produksi tanaman di Indonesia, GAP dan SOP, Fisiologi Pembungaan, Fisiologi Pembuahan tanaman, Off Season Production, Implementasi ZPT (Pemacu dan penghambat) thd pertumbuhan dan perkembangan tanaman, Manipulasi Teknologi Produksi (Kuantitas dan kualitas, tanaman *Physiology and Growth Models, Plant Development, Physiology of Germination and Dormancy, Physiology of Vegetative and Generative Growth, Formation and Pruning of Trees, Relationship and Balance of Sources and Sinks on vegetative and generative growth, Characteristics of plant products and production in Indonesia, GAP and SOP, Physiology of Flowering, Physiology of plant fertilization, Off Season Production, Implementation of ZPT (Encourages and Inhibitors) in Plant Growth and Plant Development, Manipulation of Production Technology (Quantity and Quality, Plants*	
Persyaratan belajar dan ujian serta bentuk ujian	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components:	

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<tr><td>Study and examination requirements and forms of examination</td><td>

Final Exam 30%
Middle Exam 20%
Structured Tasks 30%
Practice 20%

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Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>

Agathokleous, E., Guedes, R. N. C., Calabrese, E. J., Fotopoulos, V., & Azevedo, R. A. 2022. Transgenerational hormesis: what do parents sacrifice for their offspring?. Current Opinion in Environmental Science & Health, 29, 100380.
Ashapkin, V. V., Kutueva, L. I., Aleksandrushkina, N. I., & Vanyushin, B. F. 2020. Epigenetic mechanisms of plant adaptation to biotic and abiotic stresses. International journal of molecular sciences, 21(20), 7457.
Baskin, J. M., & Baskin, C. C. 2019. Effect of selective abortion on seed germination and post-germination performance of offspring. Seed Science Research, 29(3), 210-214.
Liu, Y. H., Zhang, M., Scheuring, C. F., Cilkiz, M., Sze, S. H., Smith, C. W., ... & Zhang, H. B. 2022. Accurate prediction of complex traits for individuals and offspring from parents using a simple, rapid, and efficient method for gene-based breeding in cotton and maize. Plant Science, 316, 111153.
Zhichkin, K., Nosov, V., Zhichkina, L., Dibrova, Z., & Cherepova, T. 2019. Development of evaluation model effectiveness of modern technologies in crop production. In IOP Conference Series: Earth and Environmental Science (Vol. 315, No. 2, p. 022023). IOP Publishing.

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

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Cekaman Lingkungan *Environmental Stress*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191236 *PG191236*
Kursus (jika ada) ***Course (if applicable)***	Cekaman Lingkungan *Environmental Stress*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Prof. Dr. Ir. Juli Santoso, MP.
Pengajar ***Lecturer***	Tim Pengajar *Team Teaching*
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agroteknologi Jenis: Pilihan Umum *Study Program: Agrotechnology Study Program* *Specialization: Agrotechnology* *Type: General Elective Course*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credit or 3.2 ETCS*
Persyaratan sesuai ketentuanujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa memahami proses-proses dan interaksi yang terjadi antara tumbuhan dan lingkungannya dalam pengaruh lingkungan dan cekamannya. Mahasiswa memahami berbagai faktor-faktor penyebab cekaman di lingkungan tanaman. Mahasiswa dapat mengaplikasikan prinsip-prinsip dan konsep-konsep adaptasi terhadap cekaman lingkungan. *Students understand the processes and interactions that occur between plants and their environment under the influence of the environment and stress.* *Students understand the factors that cause stress in the plant environment.* *Students can apply the principles and concepts of adaptation to environmental stress.*	CPL-4 CPL-5 CPL-6 *PLO-4* *PLO-5* *PLO-6*
Isi ***Content***	Dalam mata kuliah ini akan akan dipelajari tentang peranan dan penggunaan bioteknologi dalam bidang pertanian. Ruang lingkup bioteknologi pertanian mencakup peningkatan produksi (*in vitro* & rekayasa genetika) dan lingkungan tumbuh tanaman (rekayasa biotik). Aplikasi bioteknologi dalam konservasi plasma nutfah, produksi masal, dan perakitan varietas unggul, pemanfaatan bioteknologi untuk cekaman abiotik dan biotik, pengembangan marka molekuler, etika pemanfaatan bioteknologi (bioetika) dan regulasi serta perlindungan produk bioteknologi. Dengan mengikuti perkuliahan ini diharapkan mahasiswa memahami dan dapat menggunakan ilmu bioteknologi di bidang pertanian. *Environmental Stress is a course developed from a plant breeding course that applies knowledge and understanding of breeding programs to abiotic and biotic environmental stresses. Environmental stress lectures include the understanding of stress or plant stress in extreme environments that are less favorable for plant physiology and growth, namely due to water stresses such as drought, inundation, light stress, temperature stress, and both high and low temperatures. In addition, it is also due to mineral stress, both macro and micronutrients, as well as due to biotic environmental stresses including plant diseases, plant pests, and weeds.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%	

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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Daftar bacaan ***Reading list***	1. Amartani, K. 2019. “Germination Response of Corn Seeds (*Zea mays.* L) under Stressed Salt Conditions: Respon Perkecambahan Benih Jagung (*Zea mays*. L) pada Kondisi Cekaman Garam”, *AGROSAINSTEK: Jurnal Ilmu dan Teknologi Pertanian*, 3(1): 9–14. 2. Indah Larasani, & Violita. 2022. Prolin Sebagai Indikator Ketahanan Tanaman Terhadap Cekaman Kekeringan. *Prosiding Seminar Nasional Biologi*, *1*(2): 1728–1738. 3. Monggesang, C. J., Tilaar, W. ., & Pinaria, A. G. 2022. Interaksi Varietas Kedelai dan Saat Pemberian Cekaman Kekeringan Pada Pertumbuhan dan Hasil Tanaman Kedelai (*Glycine Max*. (L.) Merril). *AGRI-SOSIOEKONOMI*, *17*(3): 925–934. 4. Sarvina, Y. 2019. Dampak Perubahan Iklim dan Strategi Adaptasi Tanaman Buah dan Sayuran di Daerah Tropis/Climate Change Impact and Adaptation Srategy for Vegetable and Fruit Crops in the Tropic Region. *Jurnal Penelitian dan Pengembangan Pertanian*.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Aplikasi Pestisida *Pesticide Application Technology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191233 *PG191233*
Kursus (jika ada) ***Course (if applicable)***	Teknologi Aplikasi Pestisida *Pesticide Technology*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Herry Nirwanto, MP.
Pengajar ***Lecturer***	Dr. Ir. Herry Nirwanto, MP. drh. Wiludjeng Widajati, MP. Ramadhani Mahendra Kusuma, SP., MP., M.Sc.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi:HPT Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credits or 3.2 ECTS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Prasyarat wajib ***Mandatory prerequisites***	Manajemen Organisme Pengganggu Tumbuhan Terpadu *Integrated of Plant Pest and Disease Management*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu berpikir kritis dan analitis, memecahkan masalah, bertanggung jawab dalam bekerja secara mandiri, dan mengambil keputusan yang tepat berdasarkan informasi yang dapat dipertanggungjawabkan Mahasiswa mampu menerapkan ilmu ilmu tanaman, konsep dasar produksi tanaman, ilmu sumber daya lahan dan tanah, serta konsep terpadu perlindungan tanaman terhadap hama dan penyakit. Mahasiswa mampu menerapkan prinsip-prinsip teknologi pertanian untuk menyelesaikan permasalahan pertanian *Student capable to think critically and analytically, solve problems, be responsible for work independently, and make appropriate decisions based on information that can be accounted* *Student capable to apply the knowledge of plant Science, the basic concepts of plant production, land resources and soil science, and integrated concept of plant protection against of pests and diseases* *Student capable to apply the principles of agricultural technology to solve agricultural problems*	CPL-2 CPL-4 CPL-5 *PLO-2* *PLO-4* *PLO-5*
Isi ***Content***	1. Pengertian pestisida dan kegunaannya dalam bidang Agroteknologi serta Pentingnya pengelolaan pestisida 2. Penggolongan dan toksisitas pestisida 3. Penggolongan dan toksisitas insektisida dan biopestisida 4. Pengaruh hormon pada hama 5. Perkembangan penelitian pestisida terhadap hama di Indonesia dan penggunaan pestisida terhadap hama di Indonesia 6. Pengaruh fungisida terhadap jamur patogen 7. Pengaruh bakterisida dan antibiotik terhadap bakteri patogen 8. Pengaruh herbisida terhadap gulma 9. Pengaruh biopestisida terhadap patogen tanaman 10. Alat dan teknik aplikasi 11. Pengaruh pestisida terhadap organisme bukan sasaran dan lingkungan 12. Manajemen aplikasi pestisida *1. Understanding pesticides and their uses in the field of Agrotechnology and the importance of pesticide management* *2. Classification and toxicity of pesticides* *3. Classification and toxicity of insecticides and biopesticides* *4. Influence of hormones on pests* *5. Development of research on pesticides against pests in Indonesia and the use of pesticides against pests in Indonesia* *6. Effect of fungicides on pathogenic fungi* *7. Effect of bactericides and antibiotics on pathogenic bacteria* *8. Effect of herbicides on weeds* *9. Effect of biopesticides on plant pathogens* *10. Application tools and techniques*	

<table>
<tr><td></td><td>11. Effect of pesticides on non-target organisms and the environment
12. Pesticide application management</td></tr>
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Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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Reading list</td><td>1. Prabhat Kumar Srivastava, Vijay Pratap Singh, Anita Singh, Durgesh Kumar Tripathi, Samiksha Singh, Sheo Mohan Prasad, and Devendra Kumar Chauhan (Ed.). 2020. Pesticides in Crop Production: Physiological and Biochemical Action. John Wiley & Sons, Inc, New York.
2. Matthews, G. A. 2018. A History of Pesticides. Oxfordshire, UK ;Boston, MA : CABI. 287 pages
3. Kumar, V.V. 2018. Biofertilizers and Biopesticides in Sustainable Agriculture. In: Meena, V. (eds) Role of Rhizospheric Microbes in Soil. Springer, Singapore.
4. Rakhimol K. R., Sabu Thomas, Tatiana Volova, Jayachandran K. 2020. Controlled Release of Pesticides for Sustainable Agriculture. Springer Nature, Switzerland. 266 pages https://doi.org/10.1007/978-3-030-23396-9</td></tr>
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	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Akarologi Tanaman *Plant Acarology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191230 *PG191230*
Kursus (jika ada) ***Course (if applicable)***	Akarologi Tanaman *Plant Acarology*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Noni Rahmadhini, SP., M.Sc.
Pengajar ***Lecturer***	Noni Rahmadhini, SP., M.Sc. Dita Megasari, SP.,Msi
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2.. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per week*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*

Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Dasar Perlindungan Tanaman *Basic of Plant Protection*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa mampu menunjukkan sikap bertanggungjawab atas pekerjaan di bidang keahliannya secara mandiri. Mahasiswa mampu mendiagnosa, menganalisis dan menyelesaikan permasalahan hama penyakit tanaman Mahasiswa mampu menguasai prinsip dan issue terkini tentang pertanian dataran rendah dan permasalahan lingkungannya Mahasiswa mampu menguasai teknologi dan mampu mengkomunikasikan dengan masyarakat dalam menyelesaikan permasalahan pertanian baik lisan maupun tulisan. *Student capable to think critically and analytically, solve problems, be responsible for work independently, and make appropriate decisions based on information that can be accounted* *Student capable to apply knowledge to identify, diagnose, analyze, plan and apply integrated pest and plant disease control.* *Student capable to manage lowland agricultural systems and related environmental issues.* *Student capable to communicate orally and in writing, work in a team, interact with other people from different backgrounds, skilled in organizing and leading in various situations.*	CPL-2 CPL-10 CPL-11 CPL-12 *PLO-2* *PLO-10* *PLO-11* *PLO-12*
Isi ***Content***	1. Pendahuluan / Introduction 2. Klasifikasi Tungau / Mites Classification 3. Morfologi Tungau / Mites Morphology 4. Fisiologi Tungau / Mites Physiology 5. Bio-ekologi Tungau/ Mites Bio-ecologhy 6. Teknik Koleksi dan Pemeliharaan / Collecting and Maintenance Technique 7. Project Based Learning (1) 8. Evaluasi Tengah Semester / Midterm Exam 9. Metastigmata 10. Prostigmata 11. Mesostigmata 12. Astigmata 13. Tungau dan Tanaman / Mites and Plants 14. Pengelolaan Tungau / Mites management 15. Project Based Learning (2) 16. Evaluasi Akhir Semester / Final Exam *1. Introduction* *2. Mites Classification* *3. Morphology of Mites / Mites Morphology* *4. Mites Physiology* *5. Mites Bio-ecology*	

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6. Collection and Maintenance Technique
7. Project Based Learning (1)
8. Midterm Evaluation / Midterm Exam
9. Metastigmata
10. Prostigmata
11. Mesostigmata
12. Astigmata
13. Mites and Plants / Mites and Plants
14. Mites management
15. Project Based Learning (2)
16. End of Semester Evaluation / Final Exam
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1. Duarte, M. E., De Mendonça, R. S., & Navia, D. (2020). Eriophyoid mites (Acariformes) from wild and cultivated Solanaceae plants from Brazil—new taxa, supplementary descriptions, a first report and new host plants of the tomato russet mite. Systematic and Applied Acarology, 25(7), 1215-1246.
2. Hemmatzadeh-khorshidabadi, H., Lotfollahi, P., Mehrvar, A., Shiri, J., & de Lillo, E. (2023). Eriophyoid (Acari: Eriophyoidea) mite fauna of Hesar village in Meshginshahr region with description of a new species. Persian Journal of Acarology, 12(3), 403-415.
3. Khodayari, S., & Shalilvand, M. H. (2021). Biological responses of Tetranychus urticae to five pepper cultivars at two phenological stages of host plants. Systematic and Applied Acarology, 26(10), 1927-1939.
4. Puspitarini, R. D., Fernando, I., Meidina, W., Afandhi, A., Tarno, H., Widjayanti, T., ... & Sabatini, V. A. (2022). Bioekologi Tungau-Tungau Penting di Bidang Pertanian. Universitas Brawijaya Press.

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

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Analisis Pertumbuhan Tanaman *Plant Growth Analysis*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191209 *PG191209*
Kursus (jika ada) ***Course (if applicable)***	Analisa Pertumbuhan Tanaman *Plant Growth Analysis*
Semester ***Semester***	VII (Tujuh) *7th (seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Nora Augustien K, MP
Pengajar ***Lecturer***	Dr. Ir. Nora Augustien K, MP Dr. Felicitas Deru Dewanti, SP, MP Ir. Djarwatiningsih PS, MP
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomi Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 Credits or 3,2 ECTS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Prasyarat wajib ***Mandatory prerequisites***	-	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa ampu menguraikan dan menerapkan Analisis Pertumbuhan Tanaman dengan metode dan formulasi pengukuran yang tepat pada tanaman sebagai indikatornya. Mahasiswa mampu menguraikan Model dan Fase Pertumbuhan Tanaman; Metode Pengamatan dan Pengukuran Peubah Tumbuh (akar, batang, dan daun) secara kuantitatif Mahasiswa menguraikan dan menerapkan teori Hubungan Source dan Sink; Keseimbangan Source dan Sink pada beberapa komoditas tanaman; Mahasiswa mampu menguraikan, menganalisis dan menerapkan Model Formulasi Analisis Organ Vegetatif dan Model Formulasi Analisis Organ Generatif /Reproduktif; Mahasiswa mampu menguraikan, menganalisis, dan menerapkan Metode Pengamatan Organ Reproduktif; Metode Analisis Hubungan Organ Vegetatif dan Generatif/ Reproduktif; Diagnosa dan Analisis Jaringan Tanaman, Metode Pengukuran Susut Panen *Student capable to describe and apply Plant Growth Analysis with appropriate measurement methods and formulations on plants as indicators.* *Student capable to describe Plant Growth Models and Phases; Method of Observing and Measuring Growth Variables (roots, stems and leaves) quantitatively* *Student capable to describe and apply the theory of Source and Sink Relationships; Balance of Source and Sink in several crop commodities;* *Student capable to describe, analyze and apply the Vegetative Organ Analysis Formulation Model and the Generative/Reproductive Organ Analysis Formulation Model;* *Student capable to describe, analyze and apply Reproductive Organ Observation Methods; Method of Analysis of the Relationship between Vegetative and Generative/Reproductive Organs; Plant Tissue Diagnosis and Analysis, Methods for Measuring Harvest Loss*	CPL 6, CPL 11 CPL 6, CPL 11 CPL 6 CPL 6, CPL 11 *PLO 6, PLO 11* *PLO 6* *PLO 11* *PLO 6* *PLO 6, PLO 11*
Isi ***Content***	Mata kuliah ini diperuntukkan kepada mahasiswa agar mampu menerapkan tentang Analisis Pertumbuhan Tanaman dengan metode dan formulasi pengukuran yang tepat pada tanaman sebagai indikatornya. Mata kuliah ini terdiri dari 2 sks dengan materi meliputi: pendahuluan Analisis Pertumbuhan Tanaman; proses pertumbuhan dan perkembangan tanaman; metode pengukuran organ tanaman; metode analisis pertumbuhan tanaman; parameter tanaman tahunan; dan hal-hal penting dalam pengamatan. *This course is intended for students to be able to apply Plant Growth Analysis with appropriate measurement methods and formulations on plants as indicators. This course consists of 2 credits with materials*	

<table>
<tr><td></td><td>including: introduction to Plant Growth Analysis; process of plant growth and development; methods of measuring plant organs; methods of analysing plant growth; parameters of perennial plants; and important matters in observation.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

<table><tr><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th></tr><tr><td>≥ 80 – 100</td><td>A</td><td>4.00</td><td>≥ 58 – <64</td><td>C+</td><td>2.50</td></tr><tr><td>≥ 76 – <80</td><td>A-</td><td>3.75</td><td>≥ 54 – <58</td><td>C</td><td>2.00</td></tr><tr><td>≥ 72 – <76</td><td>B+</td><td>3.50</td><td>≥ 50 – <54</td><td>C-</td><td>1.75</td></tr><tr><td>≥ 68 – <72</td><td>B</td><td>3.00</td><td>≥ 46 –<50</td><td>D+</td><td>1.50</td></tr><tr><td>≥ 64 – <68</td><td>B-</td><td>2.75</td><td>≥ 42 – <46</td><td>D</td><td>1.00</td></tr><tr><td></td><td></td><td></td><td>0 - < 42</td><td>E</td><td>0.00</td></tr></table></td></tr>
<tr><td>Media yang digunakan
Media employed</td><td>Hardwares : Projector and screensr, reference book, sound system
Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.</td></tr>
<tr><td>Daftar bacaan
Reading list</td><td>1. Demir, S., & ÇELİKEL, F. G. (2019). Effects of plant growth regulators on the plant height and quantitative properties of Narcissus tazetta. Turkish journal of agriculture and forestry, 43(1), 105-114.
2. Reza, P. M. A., Syuhriatin, S., & Rahayu, S. M. (2021). Analisis Pertumbuhan Tanaman Paprika (Capsicum annuum var. grossum) Berdasarkan Pola Tanam. Lombok Journal of Science, 3(1), 23-32.
3. Wakano, F., Nohong, B., Nompo, S., Asikin, N., & Fitriani, F. (2023). PENGARUH JENIS PUPUK, Kerapatan tanaman dan growth degree unit terhadap pertumbuhan sorgum (Sorghum bicolor L. Moench). Journal Gallus Gallus, 1(3), 17-24.
4. Zulkifli, T. B. H., Tampubolon, K., Nadhira, A., Berliana, Y., Wahyudi, E., Razali, R., & Musril, M. (2020). Analisis pertumbuhan, asimilasi bersih dan produksi terung (solanum melongena l.): dosis pupuk kandang kambing dan pupuk npk. Jurnal Agrotek Tropika, 8(2), 295-310.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Pengendalian Hama Penyakit Pasca Panen *Post-Harvest Pest and Disease Control*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 141102 *PG 141102*
Kursus (jika ada) ***Course (if applicable)***	Pengendalian Hama Penyakit Pasca Panen *Post-Harvest Pest and Disease Control*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Arika Purnawati, MP.
Pengajar ***Lecturer***	Dr. Ir. Arika Purnawati, MP. Noni Rahmadhini, SP., M.Sc Rahmadhani Mahendra K, SP., MP.,M.Sc
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 Credits or 3,2 ECTS*
Persyaratan sesuai ketentuan ujian ***Requirements according to the examination regulations***	Mahasiswa harus menghadiri 75% perkuliahan Students must attend 75% of lectures

<table>
<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td colspan="2">Pengendalian Hama dan Penyakit Terpadu
Integrated Pest and Disease Management</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mahasiswa mampu menguasai prinsip-prinsip penerapan teknologi pertanian untuk menyelesaikan permasalahan di bidang pertanian
Mahasiswa mampu permasalahan hama penyakit tanaman
Mahasiswa menguasai teknologi dan mampu mengkomunikasikan dengan masyarakat dalam menyelesaikan permasalahan pertanian baik lisan maupun tulisan

Student capable to apply the principles of agricultural technology to solve agricultural problems
Student capable to apply knowledge to identify, diagnose, analyze, plan and apply integrated pest and plant disease control
Student capable to communicate orally and in writing, work in a team, interact with other people from different backgrounds, skilled in organizing and leading in various situations.</td><td>CPL-5

CPL-10

CPL-12

PLO-5

PLO-10

PLO-12</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Pokok bahasan mata kuliah adalah : pengertian gudang dan persyaratannya sebagai tempat penyimpanan komoditas pertanian, mekanisme kerusakan komoditas pascapanen, gejala pascapanen oleh hama dan penyakit, faktor-faktor yang mempengaruhi keberadaan hama dan penyakit pascapanen serta cara-cara pengendaliannya, cara mendiagnosa, menganalisis dan menyelesaikan masalah pengendalian hama penyakit pascapanen, teknik pengendalian hama penyakit pascapanen

The main topics of the course are: understanding warehouses and their requirements as a place to store agricultural commodities, post-harvest commodity damage mechanisms, post-harvest symptoms of pests and diseases, factors that influence the presence of post-harvest pests and diseases and ways to control them, how to diagnose, analyze and resolve post-harvest pest control problems, post-harvest pest control techniques</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td colspan="2">Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Daftar bacaan ***Reading list***	1. Alaydrus, A. Z. A., Wirda, Z., Marlina, L., Ndapamuri, M. H., Rizkaprilisa, W., Carsidi, D., ... & Pebrianti, S. A. (2023). *Fisiologi dan Teknologi Pasca Panen*. Global Eksekutif Teknologi. 2. Gusnawaty, H. S., Putri, N. P., Johan, E. A., & Arini, R. (2023). *Buku Ajar Penyakit Benih dan Pascapanen*. Penerbit NEM. 3. Ramdan, E. P., Arti, I. M., & Risnawati, R. (2019). Identifikasi dan uji virulensi penyakit antraknosa pada pascapanen buah cabaI. *Jurnal Pertanian Presisi (Journal of Precision Agriculture)*, *3*(1), 67-76. 4. Susetyo, H. P. (2023). Menyiasati Kehilangan Hasil Dengan Penanganan Penyakit Pascapanen. *Buletin Teknologi & Inovasi Pertanian*, *2*(1), 10-14. 5. Wagiman, F. X. (2019). *Hama pascapanen dan pengelolaannya*. UGM PRESS.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Pasca Panen *Post-Harvest Technology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191210 *PG191210*
Kursus (jika ada) ***Course (if applicable)***	Teknologi Pasca Panen *Post-Harvest Technology*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for theModule***	Nova Triani, SP, MP
Pengajar ***Lecturer***	1. Nova Triani, SP, MP 2. Fadila Suryandika, STP, M.Sc
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomi Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 credits or 3.2 ECTS
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

<table>
<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td colspan="2">-</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mahasiswa mampu menjelaskan substansi teknologi pascapanen dan pascapanen
Mahasiswa mampu menjelaskan dan melaporkan perubahan pasca panen ditinjau dari aspek fisiologis dan fisik.
Mahasiswa mampu merangkum dan mendemonstrasikan teknologi pascapanen berbasis komoditas pangan, hortikultura, dan perkebunan.

Students are able to explain the substance of post-harvest and post-harvest technology
Students are able to explain and report on post-harvest changes in terms of physiological and physical aspects.
Students are able to summarize and demonstrate post-harvest technology based on food, horticulture, and plantation commodities.</td><td>CPL-5

CPL-2, CPL-5

CPL-2, CPL-12

PLO 5

PLO 2, PLO 5

PLO 2, PLO 12</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Mata kuliah ini memberikan pemahaman tentang perubahan fisik dan fisiologis yang terjadi pada komoditas pascapanen, tahapan proses pascapanen, dan teknologi pascapanen pada komoditas hortikultura, pangan, dan perkebunan. Tahapan proses pasca panen dipelajari mulai dari kegiatan pemanenan, perontokan, pengeringan, penyimpanan, pengangkutan, dan penggilingan. Teknologi pasca panen dipelajari pada setiap tahapan proses, baik pengenalan teknologi mekanis maupun non mekanis.

This course provides an understanding of the physical and physiological changes that occur in post-harvest commodities, the stages of the post-harvest process, and post-harvest technology in horticultural, food and plantation commodities. The stages of the post-harvest process are studied starting from harvesting, threshing, drying, storage, transportation, and milling activities. Post-harvest technology is studied at each stage of the process, both mechanical and non-mechanical technology introduction.</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td colspan="2">Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 40%
● Middle Exam 30%
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Daftar bacaan ***Reading list***	1. Asiah, N., David, W., & Djaeni, M. (2020). *Teknologi Pascapanen Bahan Pangan*. Deepublish. 2. Awanis, A., Qomariyah, R., & Lesmayati, S. (2021). *Peran Teknologi Pascapanen dalam Menjamin Keamanan Produk Hortikultura* (Doctoral dissertation, Sebelas Maret University). 3. Sikorski, Z. E., Kołakowska, A., & Burt, J. R. (2020). Postharvest biochemical and microbial changes. In *Seafood* (pp. 55-75). CRC Press. 4. Yahia, E. M., & Carrillo-Lopez, A. (Eds.). (2018). *Postharvest physiology and biochemistry of fruits and vegetables*. Woodhead publishing.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Rehabilitasi Lahan Terdegradasi *Rehabilitation Technology for Degraded Land*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191215 *PG 191215*
Kursus (jika ada) ***Course (if applicable)***	Teknologi Rehabilitasi Lahan Terdegradasi *Rehabilitation Technology for Degraded Land*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Wanti Mindari, MP.
Pengajar ***Lecturer***	Dr. Ir. Wanti Mindari, MP. Dr. Ir. Purnomo Edi Sasongko, MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	*1. Kuliah: 100 menit/pertemuan (14 pertemuan)* *2. Tugas terstruktur/kuis/presentasi kelompok* *3. Praktikum 100 menit/pertemuan (12 pertemuan)* *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation* *3. Lab Work 100 minutes/meeting (12 meetings)*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu* Praktikum : 1 x 170 = 170 menit per minggu *Practice : 1 x 170 = 170 minutes per minggu*
Angka kredit ***Credit point***	3 SKS *3 credits or 4.8 ETCS*

Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Prasyarat wajib ***Mandatory prerequisites***	Dasar Ilmu Tanah *Basic of Soil Science*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa menunjukkan sikap bertanggungjawab atas pekerjaan di bidang keahliannya secara mandiri	CPL-2
	Mahasiswa mampu memelihara dan mengembangkan jejaring kerja secara kolaboratif dengan pembimbing, kolega, sejawat baik di dalam maupun di luar lembaganya	CPL-3
	Mampu menerapkan pengetahuan Ilmu Tanaman dan konsep dasar Produksi Tanaman, Tanah dan konsep dasar Sumber dan daya lahan, konsep perlindungan tanaman terhadap hama & penyakit secara terpadu	CPL-4
	Mahasiswa mampu mengidentifikasi, merumuskan, menganalisis dan menyelesaikan permasalahan bidang sumberdaya lahan	CPL-9
	Student capable to think critically and analytically, solve problems, be responsible for work independently, and make appropriate decisions based on information that can be accounted	*PLO-2*
	Student capable to maintain and develop collaborative networks with mentors, colleagues, both inside and outside their respective workplace	*PLO-3*
	Student capable to apply the knowledge of plant Science, the basic concepts of plant production, land resources and soil science, and integrated concept of plant protection against of pests and diseases	*PLO-4*
	Student capable to apply knowledge of identifying, formulating, analyzing, planning and applying land resource management	*PLO-9*
Isi ***Content***	Konsepsi teknologi rehabilitasi lahan, macam teknik rehabilitasi lahan, Identifikasi Dampak Rehabilitasi lahan terhadap Ciri tanah, Analisis Dampak Rehabilitasi lahan terhadap Ciri tanah, Evaluasi Dampak Rehabilitasi lahan terhadap Ciri tanah, Penerapan Rehabilitasi lahan terhadap kesuburan tanah, Observasi lahan-lahan terdegradasi di Indonesia, Identifikasi lahan -lahan terdegradsai: fisik-kimia-biologi, Analisis permasalahan lahan -lahan terdegradsai: fisik-kimia-biologi *Concept of land rehabilitation technology, types of land rehabilitation techniques, Identification of the Impact of Land Rehabilitation on Soil Characteristics, Analysis of the Impact of Land Rehabilitation on Soil Characteristics, Evaluation of the Impact of Land Rehabilitation on Soil Characteristics, Application of Land Rehabilitation on Soil Fertility, Observation of degraded lands in Indonesia, Identification degraded lands: physical-chemical-biology, Analysis of degraded land problems: physical-chemical-biological*	

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<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
● Final Exam 30%
● Middle Exam 20%
● Structured Tasks 30%
● Practice 20%

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Reading list</td><td>1. Ajai Rimjhim Bhatnagar. 2022. Desertification and Land Degradation: Concept to Combating. Taylor & Francis Group LLC. CRC Press. Boca Raton.
2. Malik, J.A. 2022. Advances in Bioremediation and Phytoremediation for Sustainable Soil Management Principles, Monitoring and Remediation. Springer Nature Switzerland AG 2022.
3. Mehmood, M.A., Hakeem, K.R. Bhat, R.A. and Dar, G.H. 2022. Pesticide Contamination in Freshwater and Soil Environts. Impacts, Threats, and Sustainable Remediation. Apple Academic Press. Buddington. Canada.
4. Naeem, M. Aftab, T. Ansari, A.A. Gill, S.S. and Macovei A. 2022. Hazardous and Trace Materials in Soil and Plants: Sources, Effects, and Management. Elsevier Inc. London UK.
5. Stanley Weeraratna. 2022. Understanding Land Degradation: An Overview. Springer.
6. Zhang, C. 2020. Soil and Groundwater Remediation: Fundamentals, Practices, and Sustainability. John Wiley & Sons, Inc., 111 River Street, Hoboken, NJ 07030, USA
7. Pankaj Panwar, et al. 2022. Land Degradation Neutrality: Achieving SDG 15 by Forest Management. Springer.
8. Dwivedi, R. S. 2019. Geospatial technologies for land degradation assessment and management. CRC Press. Boca Raton.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Hubungan Nutrisi, Tanah dan Tanaman *Relationship of Nutrients, Soil and Plants*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191220 *PG 191220*
Kursus (jika ada) ***Course (if applicable)***	Hubungan Nutrisi, Tanah dan Tanaman *Relationship of Nutrients, Soil and Plants*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Wanti Mindari, MP.
Pengajar ***Lecturer***	Dr. Ir. Wanti Mindari, MP. Ir. Siswanto, MP.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 Credits or 3,2 ECTS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Prasyarat wajib ***Mandatory prerequisites***	Dasar Ilmu Tanah *Introduction of Soil Science*	
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Mahasiswa menunjukkan sikap bertanggungjawab atas pekerjaan di bidang keahliannya secara mandiri	CPL-2
	Mahasiswa mampu memelihara dan mengembangkan jejaring kerja secara kolaboratif dengan pembimbing, kolega, sejawat baik di dalam maupun di luar lembaganya	CPL-3
	Mahasiswaampu menerapkan pengetahuan Ilmu Tanaman dan konsep dasar Produksi Tanaman, Tanah dan konsep dasar Sumber dan daya lahan, konsep perlindungan tanaman terhadap hama & penyakit secara terpadu	CPL-4
	Mahasiswa mampu mengidentifikasi, merumuskan, menganalisis dan menyelesaikan permasalahan bidang sumberdaya lahan	CPL-9
	Student capable to think critically and analytically, solve problems, be responsible for work independently, and make appropriate decisions based on information that can be accounted	*PLO-2*
	Student capable to maintain and develop collaborative networks with mentors, colleagues, both inside and outside their respective workplace	*PLO-3*
	Student capable to apply the knowledge of plant Science, the basic concepts of plant production, land resources and soil science, and integrated concept of plant protection against of pests and diseases	*PLO-4*
	Student capable to apply knowledge of identifying, formulating, analyzing, planning and applying land resource management	*PLO-9*
Isi ***Content***	1. Konsep-konsep hubungan hara tanah tanaman 2. Faktor penentu hubungan hara tanah tanaman (nutrisi, air, tanaman-lingkungan 3. Identifikasi permasalahan hubungan hara dalam tanah dan tanaman melalui studi kasus melalui literatur terpilih 4. Analisis permasalahan serapan hara dari literatur/ jurnal terpilih 5. Ujian Tengah Semester 6. Merancang model penelitian hubungan hara tanah dan tanaman dari beberapa kondisi tanah dan memutuskan metode apa yang digunakan untuk mendapatkan sinkronisasi suplai dan ketersediaan nutrisi bagi tanaman. kegiatan dikerjakan secara berkelompok 4-5 orang, melalui observasi hingga evaluasi secara lapang 7. Menyusun laporan hasil kegiatan observasi hingga evaluasi 8. Presentasi dan diskusi hasil design pengelolaan kesuburan tanah 9. Ujian Akhir Semester 1. *Concepts of plant-soil nutrient relationships* 2. *Factors determining plant-soil nutrient relationships (nutrients, water, plant-environment* 3. *Identify problems in the relationship between nutrients in soil and plants through case studies through selected literature* 4. *Analysis of nutrient uptake problems from selected literature/journals* 5. *Midterm Exam*	

<table>
<tr><td></td><td>6. Design a research model for the relationship between soil nutrients and plants from several soil conditions and decide what method to use which is used to synchronize the supply and availability of nutrients for plants. activities are carried out sequentially in groups of 4-5 people, through observation and field evaluation
7. Prepare reports on the results of observation and evaluation activities
8. Presentation and discussion of the results of the soil fertility management design
9. Final Semester Examination</td></tr>
<tr><td>Persyaratan belajar dan ujian serta bentuk ujian
Study and examination requirements and forms of examination</td><td>Exam requirements: Minimum 75% attendance to take the final exam
Question Form: Essay or Assignment
Final Score Components:
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● Middle Exam 20%
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Reading list</td><td>1. Anggoro, R. O. (2023). BAB 2 Hubungan tanah, air, dan tanaman. kesuburan tanah kesuburan tanah dan pemupukan dan pemupukan, 15.
2. Priyono, I., & MM, S. S. (2020). Nutrisi Bagi Tanaman. Unisri Press.
3. Siregar, F. A. (2023). Penggunaan pupuk organik dalam meningkatkan kualitas tanah dan produktivitas tanaman.
4. Tando, E. (2019). Upaya efisiensi dan peningkatan ketersediaan nitrogen dalam tanah serta serapan nitrogen pada tanaman padi sawah (Oryza sativa L.). Buana Sains, 18(2), 171-180.
5. Febriani, L., Gunawan, G., & Gafur, A. (2021). Pengaruh Jenis Media Tanam Terhadap Pertumbuhan Tanaman. Bioeksperimen: Jurnal Penelitian Biologi, 7(2), 93-104.</td></tr>
</table>

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN" JAWA TIMUR**

Nama Modul ***Module name***	Virologi Tanaman *Agricultural Virology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG 191232 *PG 191232*
Kursus (jika ada) ***Course (if applicable)***	Virologi Tanaman *Plant Virology*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Dr. Ir. Penta Suryaminarsih, MP.
Pengajar ***Lecturer***	Dr. Ir. Penta Suryaminarsih, MP. Dr. Ir. Tri Mujoko, MP. Dita Megasari, SP., M.Si.
Bahasa ***Language***	Indonesia dan Inggris *Indonesian and English*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: HPT Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Plant Protection* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 Credits or 3,2 ECTS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

<table>
<tr><td>Prasyarat wajib
Mandatory prerequisites</td><td colspan="2">Dasar Perlindungan Tanaman, Mikrobiologi Pertanian
Basic of Plant Protection, Agricultural Microbiology</td></tr>
<tr><td>Hasil belajar dan PLO yang sesuai
Learning outcomes and their corresponding PLOs</td><td>Mahasiswa mampu memelihara dan mengembangkan jejaring kerja secara kolaboratif dengan pembimbing, kolega, sejawat baik di dalam maupun di luar lembaganya
Mahasiswa mampu menguasai prinsip-prinsip penerapan teknologi pertanian untuk menyelesaikan permasalahan di bidang pertanian
Mahasiswa mampu mendiagnosa, menganalisis dan menyelesaikan permasalahan hama penyakit tanaman.

Student capable to maintain and develop collaborative networks with mentors, colleagues, both inside and outside their respective workplace
Student capable to apply the principles of agricultural technology to solve agricultural problems
Student capable to apply knowledge to identify, diagnose, analyze, plan and apply integrated pest and plant disease control.</td><td>CPL-3

CPL-5

CPL-10

PLO-3

PLO-5

PLO-10</td></tr>
<tr><td>Isi
Content</td><td colspan="2">Bahan kajian untuk Capaian pembelajaran Mata Kuliah Virologi tumbuhan adalah bahasan dan diskusi peran pengetahuan virus tumbuhan dalam menyelesaikan masalah produksi pertanian, Pengembangan pengetahuan Struktur dan Fungsi Virus, Klasifikasi dan Nomenklatur Virus, Replikasi dan Transmisi Virus, Metode Deteksi dan penelitian Virus tumbuhan untuk dapat menyusun suatu Project proposal penelitian. Materi tentang Penyebaran dan Epidemi Virus tanaman , Pengendalian Penyakit Virus Tanaman, analisi problem penyakit virus tumbuhan dan pengelolaannya

Study materials for the learning outcomes of the Plant Virology Course are discussion and discussion of the role of knowledge of plant viruses in solving agricultural production problems, development of knowledge of virus structure and function, classification and nomenclature of viruses, replication and transmission of viruses, methods of detection and research on plant viruses to be able to compile a Research proposal project. Material on the spread and epidemics of plant viruses, control of plant virus diseases, analysis of plant virus disease problems and their management</td></tr>
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Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Daftar bacaan ***Reading list***	1. Awasthi, L. P. (Ed.). (2020). *Applied plant virology: advances, detection, and antiviral strategies*. Academic Press. 2. Garcia-Ruiz, H. (2019). Host factors against plant viruses. *Molecular plant pathology*, *20*(11), 1588-1601. 3. Kalinina, N. O., Khromov, A., Love, A. J., & Taliansky, M. E. (2020). CRISPR applications in plant virology: virus resistance and beyond. *Phytopathology*, *110*(1), 18-28. 4. Marianah, L. (2020). Serangga vektor dan intensitas penyakit virus pada tanaman cabai merah. *AgriHumanis: Journal of Agriculture and Human Resource Development Studies*, *1*(2), 127-134. 5. Scholthof, H. B., & Scholthof, K. B. G. (2023). Plant virology: An RNA treasure trove. *Trends in Plant Science*.

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Nama Modul ***Module name***	Teknologi Pengendalian Gulma *Weed Control Technology*
Level modul ***Module level***	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Kode ***Code***	PG191201 *PG191201*
Kursus (jika ada) ***Course (if applicable)***	Teknologi Pengendalian Gulma *Weed Control Technology*
Semester ***Semester***	VII (Tujuh) *7th (Seventh)*
Penanggung Jawab Modul ***Person Responsible for the Module***	Puji Lestari Tarigan, S.P., M.Sc.
Pengajar ***Lecturer***	1. Dr. Ir. Wiwin Windriyanti D. M.P. 2. Puji Lestari Tarigan, S.P., M.Sc.
Bahasa ***Language***	Indonesia *Indonesian*
Kaitannya dengan Kurikulum ***Relation to Curriculum***	Program Studi: Program Studi Agroteknologi Spesialisasi: Agronomi Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Agronomy* *Type: Elective*
Jenis Pengajaran, Jam Kontak ***Type of Teaching, Contact Hours***	1. Kuliah: 100 menit/pertemuan (14 pertemuan) 2. Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Beban kerja ***Work load***	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per week*
Angka kredit ***Credit point***	2 SKS *2 credits or 3.2 ECTS*
Persyaratan sesuai ketentuanujian ***Requirements according to theexamination regulations***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*
Prasyarat wajib	-

Mandatory prerequisites		
Hasil belajar dan PLO yang sesuai ***Learning outcomes and their corresponding PLOs***	Menunjukkan sikap bertanggungjawab atas pekerjaan di bidang keahliannya secara mandiri. Mampu menguasai prinsip-prinsip penerapan teknologi pertanian untuk menyelesaikan permasalahan di bidang pertanian. Mampu menganalisis, merencanakan, dan menerapkan sistem pertanian dataran rendah mengacu pada prinsip pertanian berkelanjutan, baik yang bersifat modern maupun yang mengangkat kearifan lokal, secara efektif dan produktif. Menguasai teknologi dan mampu mengkomunikasikan dengan masyarakat dalam menyelesaikan permasalahan pertanian baik lisan maupun tulisan. *Students demonstrate a responsible attitude towards work in their field of expertise independently.* *Students master the principles of applying agricultural technology to solve problems in the agricultural sector.* *Students are able to analyze, plan and implement lowland agricultural systems referring to the principles of sustainable agriculture, both modern and local wisdom, effectively and productively.* *Students master technology and are able to communicate with the community in solving agricultural problems both orally and in writing.*	CPL-2 CPL-5 CPL-6 CPL-12 *PLO-2* *PLO-5* *PLO-6* *PLO-12*
Isi ***Content***	Mata kuliah ini membahas tentang terminologi gulma dan definisi gulma, klasifikasi dan distribusi gulma, biologi gulma, ekologi gulma, alelopati, analisis vegetasi, pengelolaan dan pengendalian gulma. *This course discusses weed terminology and weed definition, weed classification and distribution, weed biology, weed ecology, allelopathy, vegetation analysis, weed management, and control.*	
Persyaratan belajar dan ujian serta bentuk ujian ***Study and examination requirements and forms of examination***	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*	
Media yang digunakan ***Media employed***	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.	
Daftar bacaan ***Reading list***	1. Rahim, A., Murtilaksono, A., & Adiwena, M. (2022). *Teknologi Pengendalian Gulma*. Syiah Kuala University Press. 2. Rahmawati, D. P. (2022). Kajian jenis-jenis gulma yang berpotensi sebagai obat herbal bagi masyarakat. *BIOMA: Jurnal Biologi dan Pembelajarannya*, *4*(2), 1-11. 3. Widaryanto, E., Saitama, A., & Zaini, A. H. (2021). *Teknologi Pengendalian Gulma*. Universitas Brawijaya Press. 4. Yuliana, A. I., & Ami, M. S. (2021). Analisis Vegetasi Dan Potensi Pemanfaatan Jenis Gulma Pasca Pertanaman Jagung. *Jurnal Agroteknologi Merdeka Pasuruan*, *4*(2), 20-28.	

	COURSE MODULE **AGROTECHNOLOGY STUDY PROGRAM** **FACULTY OF AGRICULTURE** **UNIVERSITAS PEMBANGUNAN NASIONAL "VETERAN"** **JAWA TIMUR**

Module name	Pengelolaan Daerah Aliran Sungai *Watersheds Management*
Module level	Program Studi Agroteknologi *Undergraduate of Agrotechnology Study Program*
Code	PG 191219 *PG 191219*
Course (if applicable)	Pengelolaan Daerah Aliran Sungai *Watersheds Management*
Semester	7th (Seventh)
Person Responsible for the Module	Dr. Ir. Bakti Wisnu Widjajani, MP
Lecturer	Dr. Ir. Bakti Wisnu Widjajani, MP Dr.Ir. Rossyda Priyadarshini, MP Fitri Wijayanti, SP., MP
Language	Indonesia *Indonesian*
Relation to Curriculum	Program Studi: Program Studi Agroteknologi Spesialisasi: Ilmu Tanah Jenis: Pilihan *Study Program: Agrotechnology Study Program* *Specialization: Soil Science* *Type: Elective*
Type of Teaching, Contact Hours	1.Kuliah: 100 menit/pertemuan (14 pertemuan) 2.Tugas terstruktur/kuis/presentasi kelompok *1. Lecture: 100 minutes/meeting (14 meetings)* *2. Structured assignments/quiz/group presentation*
Work load	Kuliah tatap muka : 2 x 50 = 100 menit per minggu *Lectures : 2 x 50 = 100 minutes per week* Tugas : 1 x 50 = 50 menit per minggu *Assignments : 1 x 50 = 50 minutes per week* Studi kasus : 1 x 50 = 50 menit per minggu *Case study : 1 x 50 = 50 minutes per minggu*
Credit point	2 SKS *2 credits or 3.2 ECTS*
Requirements according to the examination regulations	Mahasiswa harus menghadiri 75% perkuliahan *Students must attend 75% of lectures*

Mandatory prerequisites	Dasar Ilmu Tanah *Introduction of Soil Science*	
Learning outcomes and their corresponding plos	Mahasiswa mampu menguasai pengelolaan kawasan Daerah Aliran Sungai yang tepat Mahasiswa mampu menguasai pengembangan lahan dalam kawasan Daerah Aliran Sungai agar produktif dari berbagai aspek *Students are able to master proper management of watershed areas* *Students are able to master land development in the River Watershed area so that it is productive from various aspects*	CPL- 4. CPL-7 CPL-11 *PLO--4, PLO-7* *PLO-11*
Content	1. Pengertian DAS dan pengelolaan DAS 2. Morfometri dan karakteristik DAS 3. Proses-proses air di dalam DAS, 4. Hujan (tipe hujan, parameter hujan, pengukuran & penentuan kawasan hujan) 5. Infiltrasi, limpasan permukaan dan karakteristik sungai 6. Debit sungai dan hidrograf 7. Banjir, kekeringan, dan kualitas air, 8. Proses erosi dan sedimentasi 9. Prediksi erosi dan nilai ETo 10. Model-model hidrologi untuk pengelolaan DAS 11. Strategi pengelolaan DAS 12. Pengelolaan DAS terpadu *1. Concept of watersheds and watershed management* *2. Watershed morphometry and characteristics* *3. Water processes in the watershed,* *4. Rain (rain types, rain parameters, measurement & determination of rain areas)* *5. Infiltration, surface runoff and river characteristics* *6. River discharge and hydrograph* *7. Floods, droughts and water quality,* *8. Erosion and sedimentation processes* *9. Erosion prediction and ETo value* *10. Hydrological models for watershed management* *11. Watershed management strategy* *12. Integrated watershed management*	
Study and examination requirements and forms of examination	Exam requirements: Minimum 75% attendance to take the final exam Question Form: Essay or Assignment Final Score Components: ● Final Exam 30% ● Middle Exam 20% ● Structured Tasks 30% ● Practice 20%	

	<table><tr><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th><th>Final Grade</th><th>Letter Grade</th><th>Grade Point</th></tr><tr><td>≥ 80 – 100</td><td>A</td><td>4.00</td><td>≥ 58 – <64</td><td>C+</td><td>2.50</td></tr><tr><td>≥ 76 – <80</td><td>A-</td><td>3.75</td><td>≥ 54 – <58</td><td>C</td><td>2.00</td></tr><tr><td>≥ 72 – <76</td><td>B+</td><td>3.50</td><td>≥ 50 – <54</td><td>C-</td><td>1.75</td></tr><tr><td>≥ 68 – <72</td><td>B</td><td>3.00</td><td>≥ 46 –<50</td><td>D+</td><td>1.50</td></tr><tr><td>≥ 64 – <68</td><td>B-</td><td>2.75</td><td>≥ 42 – <46</td><td>D</td><td>1.00</td></tr><tr><td></td><td></td><td></td><td>0 - < 42</td><td>E</td><td>0.00</td></tr></table>
Media employed	Hardwares : Projector and screensr, reference book, sound system Softwares : MS Windows, MS Power Point , Zoom application, E-Learning UPN, E-book, WA Group, GDrive.
Reading list	1. Bokiraiya Latuamury. (2020). Buku Ajar Manajemen DAS Pulau-Pulau Kecil. (n.p.): Deepublish. 2. Didik Suprayogo, Widianto, Kurniatun Hairiah, Istika Nita. (2017). Manajemen Daerah Aliran Sungai (DAS): Tinjauan Hidrologi Akibat Perubahan Tutupan Lahan dalam Pembangunan. (n.p.): Universitas Brawijaya Press. 3. Tamaulina Br. Sembiring. (2022). Pengelolaan daerah aliran sungal : Studi di Kawasan DAS Kabupaten Langkat. (n.p.): Penerbit Adab. 4. Safa Muzdalifah, Farah Qubayla, Said Khaidir. (2021). Management Strategy of Sub-Watersheds Affected By Flooding In Banjar District, South of Kalimantan: International Journal of Politic, Public Policy and Environmental Issues,1 (2) 126-134.