MODUL HANDBOOK

AGROINDUSTRIAL TECHNOLOGY
(MASTER'S DEGREE)

FAKULTAS TEKNOLOGI INDUSTRI PERTANIAN

FACULTY OF AGROINDUSTRIAL TECHNOLOGY
UNIVERSITAS PADJADJARAN
2024

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE:** N20A1003

Module designation	Agricultural product characteristics
Semester(s) in which the module is taught	1
Person responsible for the module	1. Bambang Nurhadi, S.TP., M.Sc., Ph.D 2. Robi Andoyo, S.TP., M.Sc., Ph.D
Language	Indonesian
Relation to curriculum	Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods	1. Lecture, Discussion, Question and Answer 2. Exploration
Workloads	Total workload: 124 hours **Class** Lecture: 3 x 50' x 14 weeks = 35 hours Assignment: 3 x 50' x 14 weeks = 35 hours Independent study: 3 x 70' x 14 weeks = 49 hours **Examination** Midterm Examination: 3 x 50' x 1 week = 2.5 hours Final Examination: 3 x 50' x 1 week = 2.5 hours
Credit points	3 (CREDITS)/4.8 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Graduates of the master of agro-industrial technology have the ability to formulate, recognize and provide alternative solutions through suitable methods related to problems in the scientific field of agro-industrial technology 2. Graduates of the master of agro-industrial technology are able to explore the roots of problems through a research process to independently formulate appropriate methods and approaches 3. Graduates of the master of technology are able to analyze, conclude and formulate integrated problem solving in the field of agro-industrial technology 4. The graduate master of agro-industrial technology has the ability to communicate, collaborate and publish on society and the environment
Content	1. Water retention of biological materials 2-3. Physical, mechanical and aerodynamic properties and characteristics of agricultural materials 4-7. Thermal and optical properties and characteristics of agricultural materials 8. Midterm examination

	9-10. Methods for measuring the properties and characteristics of agricultural materials 11-12. System for measuring the properties and characteristics of agricultural materials 13-14. Methods and measurement systems in the operation of various agricultural production systems 15. Methods and measurement systems for designing various agricultural production systems 16. Final examination
Examination forms	Presentation Material and Oral Presentation
Study and examination requirements	1. Minimum attendance at lectures is 80%. 2. Components consist of 20% Quiz, 20% Assignments, 30% UTS, 30% UAS 3. The final score consists of Knowledge 5%, General Ability 45%, Special Skills 45%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A1006

Module designation	Advanced Soil and Water Conservation
Semester(s) in which the module is taught	1
Person responsible for the module	1.Dr. Ir. Edy Suryadi, M.T2. Kharistya Amaru, S.TP., MT, Ph.D3. Dr. Dwi Rustam Kendarto S.Si., MT
Language	Indonesian
Relation to curriculum	Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods	1. Lecture, Discussion, Question and Answer 2. Exploration
Workloads	Total workload: 124 hours **Class** Lecture: 3 x 50' x 14 weeks = 35 hours Assignment: 3 x 50' x 14 weeks = 35 hours Independent study: 3 x 70' x 14 weeks = 49 hours **Examination** Midterm Examination: 3 x 50' x 1 week = 2.5 hours Final Examination: 3 x 50' x 1 week = 2.5 hours
Credit points	3 (CREDITS)/4.8 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Agro-industrial technology master's graduates have the ability to formulate, recognize and provide alternative solutions through appropriate methods related to problems in the scientific field of agro-industrial technology 2. Agro-industrial technology master's graduates have the ability to understand concepts and theories to design, apply and evaluate scientifically and communicate academically 3. Master of Technology graduates are able to analyze, conclude and formulate integrated problem solving in the field of agro-industrial technology 4. Able to integrate theory and practice based on theory, models and methods for effective implementation of problems in society as well as recognizing socio-economic and ecological implications
Content	1. Understanding conservation 2. Definition and types of erosion 3. Estimation of erosion rates 4. Erosion Rate Estimation Method 5. Soil and water conservation methods

	6. Planning and designing soil and water preservation techniques using biological methods 7. Engineering design Soil and water preservation chemical methods 8. Midterm examination 9-10. Design of soil and water preservation techniques using chemical methods 11-12. Conservation in the oil palm plantation agro-industry 13-14. Sustainability analysis in soil and water conservation 15. Conservation methods in agro-industry 16. Final Examination
Examination forms	Presentation Material and Oral Presentation
Study and examination requirements	1. Minimum attendance at lectures is 80%. 2. Components consist of Assignments 40%, UTS 30%, UAS 30% 3. The final score consists of General Ability 55%, Special Skills 40%, Ethics 5%
Reading list	Schwab, soil and water engineering

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A1006

Module designation	Advanced Food Processing Technology
Semester(s) in which the module is taught	1
Person responsible for the module	1.Dr. Rossi Indiarto, S.TP., M.Si2. Debby M. Sumanti3. Siti Nurhasanah
Language	Indonesian
Relation to curriculum	Elective Course Master of Agro-Industrial Study Program
Teaching methods	1. Lecture, Discussion, Question and Answer 2. Exploration
Workloads	Total workload: 124 hours **Class** Lecture: 3 x 50' x 14 weeks = 35 hours Assignment: 3 x 50' x 14 weeks = 35 hours Independent study: 3 x 70' x 14 weeks = 49 hours **Examination** Midterm Examination: 3 x 50' x 1 week = 2.5 hours Final Examination: 3 x 50' x 1 week = 2.5 hours
Credit points	3 (CREDITS)/4.8 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Agro-industrial technology master's graduates have the ability to formulate, recognize and provide alternative solutions through appropriate methods related to problems in the scientific field of agro-industrial technology 2. Agro-industrial technology master's graduates have the ability to understand concepts and theories to design, apply and evaluate scientifically and communicate academically 3. Master of Technology graduates are able to analyze, conclude and formulate integrated problem solving in the field of agro-industrial technology 4. Able to integrate theory and practice based on theory, models and methods for effective implementation of problems in society as well as recognizing socio-economic and ecological implications
Content	1. Processing Using Ohmic Heating 2. Processing Using Ultrasound 3. Processing Using PEF 4. Packaging for food products 5-6. Literacy and scientific documentation on processing using PEF ozonization and encapsulation nanotechnology methods

	7. Processing technology using microwaves 8. Midterm examination 9. Processing technology using HPP (High Pressure Processing) 10. Processing Technology Using SSD Superheated Steam Drying 11. Processing Technology Using Irradiation 12-13. Literacy and scientific documentation on processing using ohmic heating microwave HPP SSD and Irradiation methods 14. Water in the Food Industry Sanitation Water Requirements and Liquid Waste Management Discussion Identify the role of Water in Food Processing Discussion 15. Identify the role of Water in Food Processing 16. Final examination
Examination forms	Presentation Material and Oral Presentation
Study and examination requirements	1. Minimum attendance at lectures is 80%. 2. Components consist of Assignments 40%, UTS 30%, UAS 30% 3. The final score consists of Knowledge 20%, General Ability 25%, Special Skills 50%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A1009

Module designation	Advanced Food Microbiology
Semester(s) in which the module is taught	1
Person responsible for the module	Yana Cahyana, S.TP., D.EA., Ph.D
Language	Indonesian
Relation to curriculum	Compulsory Course Master Agro-Industrial Study Program
Teaching methods	1. Lecture, Discussion, Question and Answer 2. Exploration
Workloads	Total workload: 82 hours **Class** Lecture: 2 x 50' x 14 weeks = 23 hours Assignment: 2 x 50' x 14 weeks = 23 hours Independent study: 2 x 70' x 14 weeks = 33 hours **Examination** Midterm Examination: 2 x 50' x 1 week = 1.67 hours Final Examination: 2 x 50' x 1 week = 1.67 hours
Credit points	2 (CREDITS)/3.2 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Graduates of the Master of Agro-Industrial Technology master engineering theory, scientific development and optimization of technology application in accordance with scientific policies and ethics in the field of agro-industrial technology 2. Agro-industrial technology master's graduates have the ability to understand concepts and theories to design, apply and evaluate scientifically and communicate academically 3. Agro-industrial technology master's graduates are able to explore the roots of problems through the research process to formulate appropriate methods and approaches independently 4. Master of Technology graduates are able to analyze, conclude and formulate integrated problem solving in the field of agro-industrial technology
Content	1. Microorganisms in Functional Food Production 2-3. Food Industry Microbiology and Biotechnology 4. Identify the role of Microbes in the Fermented Food Industry 5. Identify the role of microorganisms

	6. Identify fermentation in Legumes 7. Principles and role of microorganisms in the food industry 8. Midterm examination 9. Microorganisms in the Utilization of Food Waste 10. Microorganism Interactions in Mixed Cultures 11. Microorganisms as Indicators in Food Products 12. Food Decomposition By Microorganisms 13. Identify the role of yeast in traditional food and beverage fermentation 14-15. Microorganisms in waste and traditional food processing 16. Final examination
Examination forms	Presentations and Oral Presentations
Study and examination requirements	1. Minimum attendance at lectures is 80%. 2. Components consist of Assignments 40%, UTS 30%, UAS 30% 3. The final score consists of General Ability 55%, Special Skills 40%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A1009

Module designation	Advanced Food Microbiology
Semester(s) in which the module is taught	1
Person responsible for the module	Yana Cahyana, S.TP., D.EA., Ph.D
Language	Indonesian
Relation to curriculum	Compulsory Course Master Agro-Industrial Study Program
Teaching methods	3. Lecture, Discussion, Question and Answer 4. Exploration
Workloads	Total workload: 82 hours **Class** Lecture: 2 x 50' x 14 weeks = 23 hours Assignment: 2 x 50' x 14 weeks = 23 hours Independent study: 2 x 70' x 14 weeks = 33 hours **Examination** Midterm Examination: 2 x 50' x 1 week = 1.67 hours Final Examination: 2 x 50' x 1 week = 1.67 hours
Credit points	2 (CREDITS)/3.2 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Graduates of the Master of Agro-Industrial Technology master engineering theory, scientific development and optimization of technology application in accordance with scientific policies and ethics in the field of agro-industrial technology 2. Agro-industrial technology master's graduates have the ability to understand concepts and theories to design, apply and evaluate scientifically and communicate academically 3. Agro-industrial technology master's graduates are able to explore the roots of problems through the research process to formulate appropriate methods and approaches independently 4. Master of Technology graduates are able to analyze, conclude and formulate integrated problem solving in the field of agro-industrial technology
Content	2. Microorganisms in Functional Food Production 2-4. Food Industry Microbiology and Biotechnology 14. Identify the role of Microbes in the Fermented Food Industry

	15. Identify the role of microorganisms 16. Identify fermentation in Legumes 17. Principles and role of microorganisms in the food industry 18. Midterm examination 19. Microorganisms in the Utilization of Food Waste 20. Microorganism Interactions in Mixed Cultures 21. Microorganisms as Indicators in Food Products 22. Food Decomposition By Microorganisms 23. Identify the role of yeast in traditional food and beverage fermentation 14-16. Microorganisms in waste and traditional food processing 17. Final examination
Examination forms	Presentations and Oral Presentations
Study and examination requirements	4. Minimum attendance at lectures is 80%. 5. Components consist of Assignments 40%, UTS 30%, UAS 30% 6. The final score consists of General Ability 55%, Special Skills 40%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A1010

Module designation	Food Safety Measurement and Concept
Semester(s) in which the module is taught	1
Person responsible for the module	1. Dwi Rustam Kendarto2. Mahani3. Robi Andoyo
Language	Indonesian
Relation to curriculum	Compulsory Course Master Agro-Industrial Study Program
Teaching methods	Lecture, Discussion, and Mini Research
Workloads	Total workload: 82 hours **Class** Lecture: 2 x 50' x 14 weeks = 23 hours Assignment: 2 x 50' x 14 weeks = 23 hours Independent study: 2 x 70' x 14 weeks = 33 hours **Examination** Midterm Examination: 2 x 50' x 1 week = 1.67 hours Final Examination: 2 x 50' x 1 week = 1.67 hours
Credit points	2 (CREDITS)/3.2 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 2. Able to carry out academic validation or studies according to their field of expertise in solving problems in society or relevant industry through developing their knowledge and expertise 3. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 4. Internalize the spirit of independence, struggle and entrepreneurship 5. Internalize academic values, norms and ethics
Content	1-2. The concept of food security in agroindustry 3-4. Food safety indicators 5-6. Factors influencing food safety 7. Relationship between determinants of food Security 8. Midterm examination 9-10. Food safety measurement techniques 11-12. Food safety index calculation technique 13-15. Evaluation of regional resilience analysis results, policy plan models 16. Final examination

Examination forms	Discussion, Paper, Activity, Material analysis
Study and examination requirements	1. Minimum attendance at lectures is 80%. 2. Components consist of 20% Quiz, 20% Assignments, 30% UTS, 30% UAS 3. The final score consists of Knowledge 20%, General Ability 25%, Special Skills 50%, Ethics 5%
Reading list	1. The concept of food security in agro-industry 2. Food security indicators 3. Factors influencing food security 4. Food safety measurement techniques

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A1011

Module designation	Nutrition and Food Balance
Semester(s) in which the module is taught	1
Person responsible for the module	1. Mahani2. Muhammad Djali
Language	Indonesian
Relation to curriculum	Compulsory Course Master Agro-Industrial Study Program
Teaching methods	Lectures and Discussions
Workloads	Total workload: 82 hours **Class** Lecture: 2 x 50' x 14 weeks = 23 hours Assignment: 2 x 50' x 14 weeks = 23 hours Independent study: 2 x 70' x 14 weeks = 33 hours **Examination** Midterm Examination: 2 x 50' x 1 week = 1.67 hours Final Examination: 2 x 50' x 1 week = 1.67 hours
Credit points	2 (CREDITS)/3.2 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 2. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 3. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 4. Internalize the spirit of independence, struggle and entrepreneurship 5. Internalize academic values, norms and ethics
Content	1-3.The concept of nutritional content in food 4-7.The concept of measuring nutritional adequacy figures 8. Midterm exam 9-15. Food balance measurement concept 16. Final exams
Examination forms	Discussion, Preparing Paper, Activeness
Study and examination requirements	1. Minimum attendance at lectures is 80%. 2. Components consist of Assignments 40%, UTS 30%, UAS 30% 3. The final score consists of Knowledge 5%, General Ability 25%, Special Skills 60%, Ethics 5%

Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A2006

Module designation	Vegetable and Animal Post-harvest Physiology
Semester(s) in which the module is taught	2
Person responsible for the module	1. Bambang Nurhadi STP., MSc., PhD 2. Dr. Herlina Marta S.TP., M.Sc.,
Language	Indonesian
Relation to curriculum	Compulsory Course Master Agro-Industrial Study Program
Teaching methods	Lectures
Workloads	Total workload: 82 hours **Class** Lecture: 2 x 50' x 14 weeks = 23 hours Assignment: 2 x 50' x 14 weeks = 23 hours Independent study: 2 x 70' x 14 weeks = 33 hours **Examination** Midterm Examination: 2 x 50' x 1 week = 1.67 hours Final Examination: 2 x 50' x 1 week = 1.67 hours
Credit points	2 (CREDITS)/3.2 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 2. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 3. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 4. Internalize the spirit of independence, struggle and entrepreneurship 5. Internalize academic values, norms and ethics
Content	1-4. The concept of nutritional content in food 4-8. The concept of measuring nutritional adequacy figures 9. Midterm exam 9-15. Food balance measurement concept 16. Final exams
Examination forms	Discussion, Preparing Paper, Activeness
Study and examination requirements	1. Minimum attendance at lectures is 80%. 2. Components consist of Assignments 40%, UTS 30%, UAS 30%

	3. The final score consists of Knowledge 5%, General Ability 25%, Special Skills 60%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A2008

Module designation	Management of Food and Agricultural Machinery
Semester(s) in which the module is taught	2
Person responsible for the module	1. Handarto, S.TP., M.Agr., Ph.DIr. Mimin Muhaemin, M.Eng., Ph.D
Language	Indonesian
Relation to curriculum	Compulsory Course Master Agro-Industrial Study Program
Teaching methods	Lectures
Workloads	Total workload: 82 hours **Class** Lecture: 2 x 50' x 14 weeks = 23 hours Assignment: 2 x 50' x 14 weeks = 23 hours Independent study: 2 x 70' x 14 weeks = 33 hours **Examination** Midterm Examination: 2 x 50' x 1 week = 1.67 hours Final Examination: 2 x 50' x 1 week = 1.67 hours
Credit points	2 (CREDITS)/3.2 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently 2. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 3. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 4. Able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism 5. Mastering the principles of developing agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 6. Develop attitudes and abilities such as honesty, collaboration, cooperation and integrity 7. Demonstrate a responsible attitude towards work in their field of expertise independently

Content	1-3. The relationship between machine operating parameters and operating costs 4-7. Optimum working patterns on field agricultural machines 8. Midterm exam 9-11 Selection of optimum machine capacity and resources in agricultural production systems 12-15 Applications of operations research in agricultural machinery management 16. Final exams
Examination forms	Ability to analyze material and assignments
Study and examination requirements	1. Minimum attendance at lectures is 80%. 2. Components consist of Assignments 40%, UTS 30%, UAS 30% 3. The final score consists of Knowledge 5%, General Ability 40%, Special Skills 50%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A2010

Module designation	Advanced Food Process Engineering
Semester(s) in which the module is taught	2
Person responsible for the module	1. Bambang Nurhadi 2. Robi Andoyo 3. Mahani
Language	Indonesian
Relation to curriculum	Compulsory Course Master Agro-Industrial Study Program
Teaching methods	Lectures
Workloads	Total workload: 82 hours **Class** Lecture: 2 x 50' x 14 weeks = 23 hours Assignment: 2 x 50' x 14 weeks = 23 hours Independent study: 2 x 70' x 14 weeks = 33 hours **Examination** Midterm Examination: 2 x 50' x 1 week = 1.67 hours Final Examination: 2 x 50' x 1 week = 1.67 hours
Credit points	2 (CREDITS)/3.2 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) 2. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 3. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal 4. Able to carry out academic validation or studies according to their field of expertise in solving problems in society or relevant industry through developing their knowledge and expertise 5. Mastering the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-

	harvest technology/food technology/food security 6. Have devotion to God Almighty and be able to show a religious attitude 7. Obey the law and be disciplined in social and state life 8. Demonstrate a responsible attitude towards work in their field of expertise independently
Content	1. Integral calculus of differential equations and solving them numerically and analytically 2-3. Steady state and unsteady state in heat transfer 4. Analytical and numerical solutions 5. Empirical and mechanistic models of the influence of temperature, Arrhenius model and log logistic model 6. A simple mechanistic model using analytical solutions for the shelf life of foodstuffs 7. Unit conversion 8. Midterm exam 9. Equation of state for ideal and real gas and Vapor liquid equilibrium 10-11. Saturated and superheated steam properties and Superheated steam drying 12-13. Stress strains and tensors 14. Viscous elastic ideal objects and viscoelastic objects 15. Rheology and texture measurements 16. Final exams
Examination forms	Ability to analyze material and assignments
Study and examination requirements	1. Minimum attendance at lectures is 80%. 2. Components consist of Assignments 40%, UTS 30%, UAS 30% 3. The final score consists of Knowledge 5%, General Ability 20%, Special Skills 70%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A2014**
Module designation		Food, Energy and Water Availability System
Semester(s) in which the module is taught		2
Person responsible for the module		Dr. Dwi Rustam Kendarto, S.Sc., MT Dr. Ir. Edy Suryadi MT Indra Firmansyah ST., M.Sc., Ph.D.
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 150 hours **Class** Lecture: 2 x 50'x 14 weeks = 23 hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 2x50'x14 weeks = 23 hours **Examination** Midterm Examination: 2x50'x1 weeks = 1.67 hours Final Examination: 2x50'x1 weeks = 1.67 hours
Credit points		3.2
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to formulate alternative solutions to agricultural engineering and food technology problems for technology development in the Food, Energy and Water Availability Systems course • able to innovate on agricultural engineering and food technology issues for technology development in the Food, Energy and Water

	Availability Systems course • able to make decisions in the context of resolving science and technology development problems that pay attention to and apply humanities values based on studies, analysis or experiments on information and data in the Food, Energy and Water Availability Systems course • able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community in the subject of Food, Energy and Water Availability Systems • master the principles of resource optimization in the application of technology in the Food, Energy and Water Availability Systems course • contribute to improving the quality of life in society, nation, state and civilization based on Pancasila in the Food, Energy and Water Availability System course • act as citizens who are proud and love their homeland, have nationalism and a sense of responsibility to the state and nation in the Food, Energy and Water Availability Systems course • appreciate the diversity of cultures, views,

	religions and beliefs, as well as other people's original opinions or findings in the Food, Energy and Water Availability Systems course
Content	studying the relationship between food, energy and water which form a single nexus. introduction of the dynamic relationship between food, energy and water components in sustainable regional development
Examination forms	Lectures, Discussions, Presentations
Study and examination requirements	**Assessment Details:** **Duty: 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 5%** **General ability: 15%** **Special Ability: 75%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A2011
Module designation		Bioproduct Engineering
Semester(s) in which the module is taught		2
Person responsible for the module		Tita Rialita, Tri Yuliana, Efri Mardawati, Edi Subroto
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 83 hours Class Lecture: 2 x 50'x 14 weeks = 23 hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 2x50'x14 weeks = 33 hours Examination Midterm Examination: 2x50'x1 weeks = 1.67 hours Final Examination: 2x50'x1 weeks = 1.67 hours
Credit points		3.2ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment in the Bioproduct Engineering course • Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of

	expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal in the Bioproduct Engineering course • able to identify the scientific field that is the object of research and position it in a research map developed through an inter or multi-disciplinary approach in the Bioproduct Engineering course • master the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security in the Bioproduct Engineering course • master the latest issues regarding the development of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security in the Bioproduct Engineering course • devoted to God Almighty and able to show a religious attitude in the Bioproduct Engineering course • demonstrate a responsible attitude towards work in their field of expertise independently in the Bioproduct Engineering course

Content	Bioproduct engineering in the agricultural industry Development of bioproduct engineering Food bioproduct engineering techniques GMO concept and theory Side effects of GMOs Crossbreeding Somatic hybridization Gene mutation Recombinant DNA technology Farmani bioproducts Bioproduct manufacturing
Examination forms	Lectures, Assignments
Study and examination requirements	**Assessment Details:** **Duty: 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 5%** **General ability: 20%** **Special Abilities: 70%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** **N20A2011**
Module designation		Numerical Methods
Semester(s) in which the module is taught		
Person responsible for the module		
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		
Credit points		
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		
Content		
Examination forms		
Study and examination requirements		
Reading list		

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A2014
Module designation		Agricultural Industry Technology Innovation
Semester(s) in which the module is taught		1
Person responsible for the module		Prof. Dr. Ir. H. Roni Kastaman MSIE Dr.Mahani SP., M.Si Dr. Ir. Lukito Hasta Pratopo M.Sc. Dr. Dwi Purnomo STP., MT
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture:3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to innovate on agricultural engineering and food technology issues for technology development in the Agricultural Industrial Technology Innovation course • able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as

	communicate through the media to the academic community and the wider community in the Agricultural Industrial Technology Innovation course • master the latest issues regarding the development of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security in the Agricultural Industrial Technology Innovation course • upholding human values in carrying out duties based on religion, morals and ethics in the Agricultural Industrial Technology Innovation course • contribute to improving the quality of life in society, nation, state and civilization based on Pancasila in the Agricultural Industrial Technology Innovation course
Content	Material and energy cycles in agro-industry and the environment Balance of material and energy utilization in production and consumption units Development of appropriate technology in various types and scales of agro-industry in Indonesia Environmental efficiency and clean technology Utilization of materials and energy in a production system that produces minimal waste. Application

	of utilization of materials and energy in a production system that produces minimal waste Application of financial and economic analysis to various agro-industrial technological innovations
Examination forms	Lecture Case study
Study and examination requirements	**Assessment Details:** **Duty: 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 5%** **General ability: 15%** **Special Ability: 75%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A2016
Module designation		Smart System
Semester(s) in which the module is taught		3
Person responsible for the module		Mimin Muhaemin, Ir., M.Eng., Ph.D.
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently in the Intelligent Systems Course • able to formulate alternative solutions to agricultural engineering and food technology problems for technology

	development in the Intelligent Systems Course • Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in a scientific journal accredited to the Intelligent Systems Course • able to identify the scientific field that is the object of research and position it in a research map developed through an inter or multi-disciplinary approach Intelligent Systems Course • master the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security Intelligent Systems Courses • master the principles of developing agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security Intelligent Systems courses

	• master the latest issues regarding the development of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security Intelligent Systems Courses • develop attitudes and abilities such as honesty, collaboration, cooperation and integrity in Intelligent Systems Courses • demonstrate a responsible attitude towards work in their field of expertise independently in the Intelligent Systems Subject
Content	History of artificial intelligence Expert system Fuzzy logic and neural networks Problems in implementing intelligent systems Computer programming for fuzzy logic and neural networks Application of intelligent systems in agro-industrial systems
Examination forms	Lecture Case study
Study and examination requirements	**Assessment Details:** **Duty: 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 5%** **General ability: 20%** **Special Abilities: 70%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A2020
Module designation		Natural Resources Management/Processing
Semester(s) in which the module is taught		3
Person responsible for the module		Prof. Ir. Chay Asdak M.Sc., Ph.D. Dr.Sophia Dwiratna Nur Perwitasari S.TP., MT
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) • able to make decisions in the context of solving science and technology development problems that pay attention to and

	apply humanities values based on studies, analysis or experiments on information and data • master the principles of resource optimization in the application of technology • work together and have social sensitivity and concern for society and the environment
Content	Definition and principles of natural resources Non-renewable Natural Resources and Renewable Natural Resources Natural Resources Conservation Optimum Natural Resource Management Utilization of Natural Resources
Examination forms	Lecture Case study
Study and examination requirements	**Assessment Details:** **Duty: 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 10%** **General ability: 15%** **Special Abilities: 70%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A2021
Module designation		Water Resources Planning
Semester(s) in which the module is taught		3
Person responsible for the module		Edy Suryadi, Sophia Dwiratna Nur Perwitasari,
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently • able to formulate alternative solutions to agricultural engineering and food technology problems for technology development

	• able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment • Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal • Able to carry out academic validation or studies according to their field of expertise in solving problems in society or relevant industry through developing their knowledge and expertise • able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism • master engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • master the principles of resource optimization in the application of technology

	• respect the diversity of cultures, views, religions and beliefs, as well as the original opinions or findings of others • work together and have social sensitivity and concern for society and the environment • demonstrate a responsible attitude towards work in their field of expertise independently
Content	Methods for collecting and analyzing climatological data. Analyze hydrological data correctly in accordance with academic ethics Determination of flood discharge PSDA Data Survey and Inventory Domestic and Industrial Agricultural Water Needs Identification in Water Resources management Identification of Agricultural Water Resources planning Calculations using software Global Planting Plan Preparation of Spatial Water Balance Water Resources Laws and Regulations Regional Water Resources Planning Patterns
Examination forms	Lecture Case study
Study and examination requirements	**Assessment Details:** **Duty: 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 10%** **General ability: 20%** **Special Abilities: 65%** **Ethics: 5%**

Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A22**
Module designation		Advanced Water Quality
Semester(s) in which the module is taught		3
Person responsible for the module		Edy Suryadi, Dwi Rustam Kendarto, Boy Macklin Pareira Prawiranegara,
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently • able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community

	• master the principles of resource optimization in the application of technology • respect the diversity of cultures, views, religions and beliefs, as well as the original opinions or findings of others
Content	Basic principles of irrigation water quality Irrigation water salinity Dangerous levels of cations and anions in irrigation water Effect of water salinity on agricultural land Irrigation water quality improvement design application
Examination forms	Lecture Case study
Study and examination requirements	**Assessment Details:** **Duty: 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 10%** **General ability: 15%** **Special Abilities: 70%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A2023
Module designation		Watershed Management Techniques
Semester(s) in which the module is taught		3
Person responsible for the module		Chay Asdak, Sophia Dwiratna Nur Perwitasari, Kharistya Amaru
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment • Able to carry out academic validation or studies according to their field of expertise in solving problems in society or relevant industry through developing their

	knowledge and expertise • able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community • able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism • master the principles of resource optimization in the application of technology • act as citizens who are proud and love their country, have nationalism and a sense of responsibility to the state and nation • internalize academic values, norms and ethics
Content	Identify the relationship between biota and abiota complexity in a watershed Identify the determination of watershed criticality Watershed Management Engineering Policy Watershed Management Plan Analysis of Irrigation Water Needs in an agricultural area Design Rain Analysis Mainstay Debt Analysis Surface Runoff Water Harvesting Watershed water balances use various measurement methods Watershed management application

	Upstream-Downstream Linkages in Watershed Management Upstream and downstream management of the watershed
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Duty: 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 10%** **General ability: 15%** **Special Abilities: 70%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A2024
Module designation		Soil Dynamics and Advanced Traction
Semester(s) in which the module is taught		3
Person responsible for the module		Ir. Mimin Muhaemin, Ph.D, Kharistya Amaru, Ph.D
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to formulate alternative solutions to agricultural engineering and food technology problems for technology development • able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach • able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism

	• master the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • work together and have social sensitivity and concern for society and the environment • demonstrate a responsible attitude towards work in their field of expertise independently
Content	Soil loads and movements Critical condition of soil mechanics Behavior of case-specific soil stress and strain relationships Soil as a growing medium for hydraulic soil compaction The relationship between the physical-mechanical properties of soil and the productivity of agricultural industrial land Soil as a foundation construction material for penetration of CBR bearing capacity in the design of agricultural industrial buildings The ground as the operating space where ground pressure and energy balance in the traction machine work. Energy balance in the contact area of the machine and the ground Traction deformation and slip Sinkage and rolling resistance
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Duty: 40%** **UTS: 30%**

	UAS: 30% **Referring to PLO:** **Knowledge: 10%** **General ability: 20%** **Special Abilities: 65%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A3038**
Module designation		Fruits and vegetables processing technology
Semester(s) in which the module is taught		3
Person responsible for the module		1. Prof. Dr. Ir. Mohamad Djali MS. 2. Dr. Rossi Indiarto S.TP., MP 3. Dr. Souvia Rahimah S.TP., M.Sc.
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment 2. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 3. Able to make decisions in the context of solving science and technology development problems that pay attention to and apply humanities values based on studies, analysis or experiments on information and data 4. Mastering the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security

	5. Contribute to improving the quality of life in society, nation, state and civilization based on Pancasila 6. Demonstrate a responsible attitude towards work in their field of expertise independently
Content	1. Harvesting and handling agricultural materials in the garden 2. Handling at the packing house 3. Trimming and cleaning 4. Curing waxing and grading 5. Packing and handling methods during transportation 6. Degreening and coloring 7. Pre-cooling vegetables and fruit 8. Cold storage of vegetables and fruits 9. Post-harvest pest and disease control and quarantine 10. Minimal processing of vegetables and fruit 11. Cold chain (cold chain)
Examination forms	Task Discussion Presentation
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 15% Special skills =75% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A2026**
Module designation		Bioenergy technology
Semester(s) in which the module is taught		2
Person responsible for the module		1. Dr. Ir.Sarifah Nurjanah M.App.Sc. 2. Dr. Efri Mardawati S.TP., MT
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 82.7 hours **Class** Lecture: 2 x 50'x 14 weeks = 23 hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 2 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 2x50'x1 weeks = 2.5 hours Final Examination: 2x50'x1 weeks = 2.5 hours
Credit points		3.2 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) 2. Able to innovate on agricultural engineering and food technology issues for technology development 3. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal

	4. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media to the academic community and the wider community 5. Able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community 6. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 7. Mastering the principles of resource optimization in the application of technology 8. Be devoted to God Almighty and be able to show a religious attitude 9. Contribute to improving the quality of life in society, nation, state and civilization based on Pancasila 10. Work together and have social sensitivity and concern for society and the environment 11. Demonstrate a responsible attitude towards work in their field of expertise independently
Content	1. Energy utilization 2. Biomass and the application of technology in the processing process 3. Characteristics of biodiesel and manufacturing process technology 4. Characteristics of bioethanol as an energy source 5. Process technology for making bioethanol products 6. Bioenergy engineering from agricultural waste materials 7. Analysis of the economic feasibility of bioenergy development
Examination forms	Exposure to material

	Discussion Question and answer
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 15% Special skills =75% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A2026**
Module designation		Bioenergy technology
Semester(s) in which the module is taught		2
Person responsible for the module		3. Dr. Ir.Sarifah Nurjanah M.App.Sc. 4. Dr. Efri Mardawati S.TP., MT
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 82.7 hours **Class** Lecture: 2 x 50'x 14 weeks = 23 hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 2 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 2x50'x1 weeks = 2.5 hours Final Examination: 2x50'x1 weeks = 2.5 hours
Credit points		3.2 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) 2. Able to innovate on agricultural engineering and food technology issues for technology development 3. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal 4. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as

	communicate them through the media to the academic community and the wider community 5. Able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community 6. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 7. Mastering the principles of resource optimization in the application of technology 8. Be devoted to God Almighty and be able to show a religious attitude 9. Contribute to improving the quality of life in society, nation, state and civilization based on Pancasila 10. Work together and have social sensitivity and concern for society and the environment 11. Demonstrate a responsible attitude towards work in their field of expertise independently
Content	1. Energy utilization 2. Biomass and the application of technology in the processing process 3. Characteristics of biodiesel and manufacturing process technology 4. Characteristics of bioethanol as an energy source 5. Process technology for making bioethanol products 6. Bioenergy engineering from agricultural waste materials 7. Analysis of the economic feasibility of bioenergy development
Examination forms	Exposure to material Discussion Question and answer
Study and examination requirements	Value components:

	Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 15% Special skills =75% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A2028**
Module designation		Regression and surface response analysis
Semester(s) in which the module is taught		3
Person responsible for the module		1. Prof. Dr. Ir. Mohamad Djali MS. 2. Bambang Nurhadi STP., MSc., PhD 3. Dr. Efri Mardawati S.TP., MT
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 2. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 3. Mastering the principles of resource optimization in the application of technology 4. Internalize the spirit of independence, struggle and entrepreneurship 5. Internalize academic values, norms and ethics
Content		1. Meaning and benefits of regression 2. Regression models and equations

	3. Simple linear regression analysis application 4. Basic assumptions for parameter estimation and testing 5. Linear regression models and analysis 6. Regression residual analysis 7. Regression model 8. Data problems with multi collinearity, autocorrelation and path analysis 9. Non-linear regression analysis Principal component analysis factor analysis cluster analysis and discriminant analysis 10. Applications of basic response surface techniques purposes and uses 11. Determination of optimum operating conditions 12. First and second order model estimation design
Examination forms	Lectures, Discussions, Presentations
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 20% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A2030**
Module designation		Functional food development
Semester(s) in which the module is taught		3
Person responsible for the module		1. Yana Cahyana S.TP., DEA., Ph.D. 2. Dr. Herlina Marta S.TP., M.Sc.
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) 2. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 3. Able to innovate on agricultural engineering and food technology issues for technology development 4. Able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment

	5. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal 6. Able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community 7. Mastering the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 8. Mastering the latest issues regarding the development of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 9. Upholding human values in carrying out duties based on religion, morals and ethics 10. Demonstrate a responsible attitude towards work in their field of expertise independently
Content	Studying the formulation and supplementation of bioactive food components for the development of functional food products, especially those based on local resources
Examination forms	Lectures, Discussions, Presentations
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO:

	Knowledge = 5% General ability = 15% Special skills =75% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A2031**
Module designation		Food Cellular Compound metabolism
Semester(s) in which the module is taught		3
Person responsible for the module		1. Dr. Fitry Filianty S.TP., M.Sc. 2. Prof. Dr. Ir. Sumanti Debby Moody MS 3. Tri Yuliana S.Si., M.Sc., Ph.D.
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 2. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 3. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 4. Internalize the spirit of independence, struggle and entrepreneurship 5. Internalize academic values, norms and ethics
Content		1. Source, function and role of food components

	2. Carbohydrates, proteins, fats, vitamins, minerals and water, as well as non-nutritive components, including food, pigments and phenolic compounds 3. Nutrient metabolism 4. Digestion and absorption by organs and distribution to the cells where metabolism takes place 5. Metabolism of non-nutritional food components 6. Enzymes and hormones involved 7. Factors facilitating metabolism 8. Metabolic inhibiting factors
Examination forms	Lectures, Discussions, Presentations
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 20% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A2032**
Module designation		Industrial food biotechnology
Semester(s) in which the module is taught		3
Person responsible for the module		1. Tri Yuliana S.Si., M.Sc., Ph.D. 2. Dr. Tita Rialita S.Si., M.Si 3. Dr.Gemilang Lara Utama Saripudin S.Pt., MIL
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment 2. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal 3. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach

	4. Able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism 5. Mastering the latest issues regarding the development of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 6. Develop attitudes and abilities such as honesty, collaboration, cooperation and integrity 7. Respect the diversity of cultures, views, religions and beliefs, as well as the original opinions or findings of others 8. Internalize academic values, norms and ethics
Content	1. Primary and secondary metabolites 2. Regulation of microbial metabolites 3. Microbial metabolic pathways 4. Biotechnology applications in the food industry 5. Organic acid production technology and prospects for its development in Indonesia Characteristics of protein and its use in the food industry Applying biotechnology knowledge in scientific writing on GMOs 6. Biomolecular Enzymes 7. Encapsulation 8. Practical applications of agricultural biotechnology
Examination forms	Task Discussion Presentation
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 20% Special skills =70% Ethics = 5%

	Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A2033**
Module designation		Advanced food storage technology
Semester(s) in which the module is taught		3
Person responsible for the module		1. Bambang Nurhadi STP., MSc., PhD 2. Dr. Rossi Indiarto S.TP., MP 3. Dr. Souvia Rahimah S.TP., M.Sc.
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 2. Able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment 3. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal

	4. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media to the academic community and the wider community 5. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 6. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 7. Internalize academic values, norms and ethics 8. Demonstrate a responsible attitude towards work in their field of expertise independently
Content	1. Handling of post-harvest products, vegetable and fruit grains in the food industry. Biological aspects of post-harvest vegetable and fruit products 2. Harvesting and handling food products in the garden 3. Post-harvest product packing in the packing ward 4. Physical identification of post-harvest products 5. Storage and control of post-harvest products 6. Psychrometric diagram 7. Shelf life of food 8. Damage that occurs to food during the storage process 9. Storage of fresh fruit and vegetables 10. Storage on grain 11. Storage of food with high sugar content
Examination forms	Task Discussion Presentation
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30%

	Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 15% Special skills =75% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A2034**
Module designation		Halal food technology
Semester(s) in which the module is taught		3
Person responsible for the module		1. Robi Andoyo S.TP., M.Sc., Ph.D. 2. Dr. Souvia Rahimah S.TP., M.Sc. 3. Dr. Efri Mardawati S.TP., MT 4. Tri Yuliana S.Si., M.Sc., Ph.D. 5. Dr. Boy Macklin Pareira Prawiranegara ST, M.Sc.
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently 2. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal

	3. Able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism 4. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 5. Be devoted to God Almighty and be able to show a religious attitude 6. Contribute to improving the quality of life in society, nation, state and civilization based on Pancasila
Content	1. Syllabus and materials at each meeting 2. Halal theories and concepts 3. Halal theories and concepts in several case examples in the agro-industry sector 4. Halal guarantee system (SJH) 5. Halal concept in milk derivative products 6. The concept of halal science 7. The concept of halal in statutory regulations 8. Halal certification process application 9. Critical points in animals 10. Halal in food 11. Halal quantification in the agro-industry scope
Examination forms	Task Discussion Presentation
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 20% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A2035**
Module designation		Fat and Oil technology
Semester(s) in which the module is taught		3
Person responsible for the module		1. Dr. Edy Subroto S.TP., MP 2. Dr. Fitry Filianty S.TP., M.Sc. 3. Dr. Siti Nurhasanah S.TP., M.Si.
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently 2. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 3. Ampu carries out academic validation or studies according to his field of expertise in solving problems in society or relevant industry through developing his knowledge and expertise 4. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach

	5. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 6. Internalize the spirit of independence, struggle and entrepreneurship 7. Internalize academic values, norms and ethics
Content	1. Fat oil extraction method 2. Fatty oil extraction technique 3. Fatty oil refining method 4. Fatty oil refining techniques 5. Methods of chemical transformation of fatty oils 6. Fatty oil chemical transformation techniques 7. Application of fatty oils in various industries 8. Application of various fatty oil derivative products in various industries
Examination forms	Task Discussion Presentation
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 15% Special skills =75% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE:** N20A3043

Module designation	Management of Technology
Semester(s) in which the module is taught	1
Person responsible for the module	1. Dr. Dwi Rustam Kendarto S.Si., MT 2. Dr. Ir. Lukito Hasta Pratopo M.Sc.,
Language	Indonesian
Relation to curriculum	Specialty Elective Courses Master of Agro-Industrial Study Program
Teaching methods	3. Lecture, Discussion, Question and Answer 4. Exploration
Workloads	Total workload: 124 hours **Class** Lecture: 3 x 50' x 14 weeks = 35 hours Assignment: 3 x 50' x 14 weeks = 35 hours Independent study: 3 x 70' x 14 weeks = 49 hours **Examination** Midterm Examination: 3 x 50' x 1 week = 2.5 hours Final Examination: 3 x 50' x 1 week = 2.5 hours
Credit points	3 (CREDITS)/4.8 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Able to innovate on agricultural engineering and food technology issues for technology development 2. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media to the academic community and the wider community 3. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 4. Mastering the principles of resource optimization in the application of technology 5. Contribute to improving the quality of life in society, nation, state and civilization based on Pancasila 6. Work together and have social sensitivity and concern for society and the environment
Content	1. Definition and scope of higher education management 2-3. Technological environment: Actors in the technological environment, Changes in the technological environment, Relationship between the technological

	environment and the economic environment, Mainstream developments in the technological environment, Implications 4. Technology adoption needs: Evaluation in technology adoption, Stages of technology adoption 5. Basic components of technology: Assessment of technological sophistication, Technometric models 6-7. Introduction: Product matrix, Technology, Technology product matrix: importance, Competitive forces, Positioning core technology 8. Midterm Exam 9. Introduction: Vertical integration, Analysis framework, Methodology, Conclusion 10. Goal: Introduction, productivity 11. Technology: technology forecasting techniques, forecast accuracy limits, technology forecasting systems, technology forecasting results 12. Introduction: From enterprise vision to technology vision - manufacturing technology, process planning, production process chain, capacity planning, capacity planning strategy 13-14. Introduction: differences between invention and innovation, revolution and evolution of innovation, product and process innovation, impact of new technology on product and process innovation, research and development modeling the innovation process, factors that influence innovation, managing and developing innovation, critical components of innovation success 15. Objectives: introduction, concept of strategic planning, dimensions of technology and corporate strategy, strategy formulation and implementation, potential strategic benefits of technology, elements of technology, strategic management of technology Reasons for technology transfer: Scope of technology transfer, technology transfer patterns, technology transfer management, several principles of technology transfer, types of technology transfer linkages, high cost factors of technology transfer,

	criticism of technology transfer, technology transfer process 16. Final Semester Exam
Examination forms	Assignments, presentations, discussions
Study and examination requirements	4. Minimum attendance at lectures is 80%. 5. Components consist of UTS 50%, UAS 50% 6. The final score consists of Knowledge 5%, General Ability 20%, Special Skills 80%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A2043

Module designation	Food Policy
Semester(s) in which the module is taught	2
Person responsible for the module	1. Dr. Ir. Edy Suryadi MT 2. Dr. Dwi Rustam Kendarto S.Si., MT 3. Dr. Ir. Lukito Hasta Pratopo M.Sc 4. Dr. Mahani SP., M.Si,
Language	Indonesian
Relation to curriculum	Specialty Elective Courses Master of Agro-Industrial Study Program
Teaching methods	Lecture, Discussion, Presentation
Workloads	Total workload: 82 hours **Class** Lecture: 2 x 50' x 14 weeks = 23 hours Assignment: 2 x 50' x 14 weeks = 23 hours Independent study: 2 x 70' x 14 weeks = 33 hours **Examination** Midterm Examination: 2 x 50' x 1 week = 1.67 hours Final Examination: 2 x 50' x 1 week = 1.67 hours
Credit points	2 (CREDITS)/3.2 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently 2. Able to innovate on agricultural engineering and food technology issues for technology development 3. Able to carry out academic validation or studies according to their field of expertise in solving problems in society or relevant industry through developing their knowledge and expertise 4. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media to the academic community and the wider community 5. Able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism

	6. Mastering the latest issues regarding the development of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 7. Acting as a citizen who is proud and loves the country, has nationalism and a sense of responsibility to the state and nation 8. Respect the diversity of cultures, views, religions and beliefs, as well as the original opinions or findings of others
Content	1. The strategic role of the agricultural sector 2. Agricultural development strategy 3-4. The position of food in national development 5. National food security system 6. National food problems 7. Strategic food security policy for developing food security 8. Midterm exam 9-10. Operational policies 11-12 Food consumption and nutrition 13-14. Draft law on food 15. Food regulations and policies 16. Final Semester Exam
Examination forms	Assignments, discussions, presentations, material analysis
Study and examination requirements	4. Minimum attendance at lectures is 80%. 5. Components consist of Quiz 20%, Assignment 20%, Participatory 10%, UTS 25%, UAS 25% 6. The final score consists of Knowledge 5%, General Ability 45%, Special Skills 45%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A3044

Module designation	Evaluation Methods of Biological Food Compounds
Semester(s) in which the module is taught	1
Person responsible for the module	
Language	Indonesian
Relation to curriculum	Specialty Elective Courses Master of Agro-Industrial Study Program
Teaching methods	Lecture, Discussion, Presentation
Workloads	Total workload: 124 hours **Class** Lecture: 3 x 50' x 14 weeks = 35 hours Assignment: 3 x 50' x 14 weeks = 35 hours Independent study: 3 x 70' x 14 weeks = 49 hours **Examination** Midterm Examination: 3 x 50' x 1 week = 2.5 hours Final Examination: 3 x 50' x 1 week = 2.5 hours
Credit points	3 (CREDITS)/4.8 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently 2. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development Able to carry out academic validation or studies according to their field of expertise in solving problems in society or relevant industry through developing their knowledge and expertise 3. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media to the academic community and the wider community 4. Able to make decisions in the context of solving science and technology development problems that pay attention to and apply humanities values based on studies, analysis or experiments on information and data

	5. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 6. Respect the diversity of cultures, views, religions and beliefs, as well as the original opinions or findings of others 7. Demonstrate a responsible attitude towards work in their field of expertise independently
Content	1. The importance of bioavailability continues 2-3. Metabolism and absorption of food components 4. Bioavailability vs bioefficacy 5. Factors influencing bioavailability 6-7. Bioavailability measurement 5. Midterm exam 6. Bioavailability of advanced food macro components 10-11. Bioavailability of advanced food microcomponents 12-13. Bioavailability of polyphenols 14-15. Strategy to increase bioavailability 16. Final Semester Exam
Examination forms	Assignments, Discussions, Presentations
Study and examination requirements	4. Minimum attendance at lectures is 80%. 5. Components consist of Assignments 40%, UTS 30%, UAS 30% 6. The final score consists of Knowledge 5%, General Ability 15%, Special Skills 75%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE:** N20A3017

Module designation	Mecatronics and Agricultural Robotics
Semester(s) in which the module is taught	1
Person responsible for the module	1. Ir. Mimin Muhaemin, M.Eng., Ph.D 2. Dr. Muhammad Achirul Nanda S.TP.
Language	Indonesian
Relation to curriculum	Specialty Elective Courses Master of Agro-Industrial Study Program
Teaching methods	5. Lecture, Discussion, Question and Answer 6. Exploration
Workloads	Total workload: 124 hours **Class** Lecture: 3 x 50' x 14 weeks = 35 hours Assignment: 3 x 50' x 14 weeks = 35 hours Independent study: 3 x 70' x 14 weeks = 49 hours **Examination** Midterm Examination: 3 x 50' x 1 week = 2.5 hours Final Examination: 3 x 50' x 1 week = 2.5 hours
Credit points	3 (CREDITS)/4.8 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	5. Graduates of the Master of Agro-Industrial Technology master engineering theory, scientific development and optimization of technology application in accordance with scientific policies and ethics in the field of agro-industrial technology 6. Agro-industrial technology master's graduates have the ability to understand concepts and theories to design, apply and evaluate scientifically and communicate academically 7. Agro-industrial technology master's graduates are able to explore the roots of problems through the research process to formulate appropriate methods and approaches independently 8. Master of Technology graduates are able to analyze, conclude and formulate integrated problem solving in the field of agro-industrial technology
Content	1. Understanding mechatronics and recognizing the application of mechatronics in the food processing industry 2. Basics of digital electronics, relays, counters, timers, motor sensors and

	understanding the principles of temperature control 3-4. Basic Industrial Control Electronics Analog Digital Relay counter timer motor sensor Temperature control 5. Basic Industrial Control Electronics Analog Digital Relay counter timer motor sensor Temperature control II 6-7. Programmable Logic Controller 1 Introduction 2 Central Processing Unit 3 Input output module 4 Basic programming 8. Midterm exam 9. Programmable Logic Controller 1Introduction2 Central Processing Unit3Inputoutput module4Basics of programming II 10. Robotics 1Understanding robotics2Applications of robotics in industry 11-12. Robotics Components 1 Controller system 2 Robot mechanical system 3 sensors 4 actuators 13. Robotics 1Controller system2Robot mechanical system3sensors4actuators 14. Robot kinematics and dynamics 15. Robot kinematics and dynamics II 16. Final exams
Examination forms	Assignments, Discussions, Presentations
Study and examination requirements	7. Minimum attendance at lectures is 80%. 8. Components consist of Assignments 40%, UTS 30%, UAS 30% 9. The final score consists of Knowledge 5%, General Ability 20%, Special Skills 75%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A3018

Module designation	Precision Farming
Semester(s) in which the module is taught	2
Person responsible for the module	Ir. Mimin Muhaemin, M.Eng., Ph.D
Language	Indonesian
Relation to curriculum	Specialty Elective Courses Master of Agro-Industrial Study Program
Teaching methods	Lecture, Discussion, Presentation
Workloads	Total workload: 124 hours **Class** Lecture: 3 x 50' x 14 weeks = 35 hours Assignment: 3 x 50' x 14 weeks = 35 hours Independent study: 3 x 70' x 14 weeks = 49 hours **Examination** Midterm Examination: 3 x 50' x 1 week = 2.5 hours Final Examination: 3 x 50' x 1 week = 2.5 hours
Credit points	3 (CREDITS)/4.8 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) 2. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media to the academic community and the wider community 3. Able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism 4. Mastering the principles of resource optimization in the application of technology 5. Mastering the latest issues regarding the development of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 6. Contribute to improving the quality of life in society, nation, state and civilization based on Pancasila 7. Demonstrate a responsible attitude towards work in their field of expertise independently

Content	1. Scope and development of accurate agricultural technology. Scope of definition of accurate agriculture. General explanation of technological developments. History of accurate agricultural development. Precision farming technology that has been applied 2. Utilization of GPS and positioning in agriculture accurate general explanation of GPS GNSS systems factors that determine GPS accuracy GPS hardware level of accuracy 3. Deferential correction in position determination, principle of differential correction, earth surface-based correction system, vehicle-based correction system, CORS network, RTK network, manual guidance system, automatic guidance system 4. Sensors and development of sensors for sensing the electromagnetic spectrum, interaction of objects with electromagnetic energy, active and passive remote sensing, spatial, temporal and spectral resolution, soil information sensors, plant information sensors, weather sensors 5. Spatial diversity of soil and water, soil formation and distribution in land threads, NRCS soil map, soil mapping technology, electrical conductivity, determining factors for differences in ground water conditions based on slope and position of slopes and soil characteristics, accurate irrigation system, accurate drainage system 6. Spatial diversity of nutrient sampling in space and time grids and soil sampling zoning 7. development of regional management for the use of nutrient sensor equipment for nutrient applications 8. Midterm exam 9. Spatial diversity of crop monitoring technology grain crop harvest monitoring technology 10. Non-grain crops calibration monitor harvest data cleaning appearance data and description

	11. Interpretation of harvest maps, harvest stability, sensor quality, spatial diversity of pests 12. Application of automation in the development of accurate agriculture Telematics in accurate agriculture 13. Introduction to map scale GIS component coordinate systems spatial and temporal analysis of image classification 14. Spatial data analysis, experimental design, data analysis, interpretation and correlation of data ownership 15. Agriculture is accurate in an economic approach 16. Final exams
Examination forms	Assignments, Discussions, Presentations
Study and examination requirements	1. Minimum attendance at lectures is 80%. 2. Components consist of Assignments 40%, UTS 30%, UAS 30% 3. The final score consists of Knowledge 5%, General Ability 20%, Special Skills 75%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A3019

Module designation	Thermal System Design
Semester(s) in which the module is taught	2
Person responsible for the module	
Language	Indonesian
Relation to curriculum	Specialty Elective Courses Master of Agro-Industrial Study Program
Teaching methods	Lectures, Discussions
Workloads	Total workload: 124 hours **Class** Lecture: 3 x 50' x 14 weeks = 35 hours Assignment: 3 x 50' x 14 weeks = 35 hours Independent study: 3 x 70' x 14 weeks = 49 hours **Examination** Midterm Examination: 3 x 50' x 1 week = 2.5 hours Final Examination: 3 x 50' x 1 week = 2.5 hours
Credit points	3 (CREDITS)/4.8 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) 2. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 3. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal 4. Able to carry out academic validation or studies according to their field of expertise in solving problems in society or relevant industry through developing their knowledge and expertise 5. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through

	the media to the academic community and the wider community 6. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 7. Mastering the principles of resource optimization in the application of technology 8. Internalize academic values, norms and ethics 9. Demonstrate a responsible attitude towards work in their field of expertise independently
Content	1. Principles of designing agricultural product processing machines 2-3. Thermal agricultural product processing machines 4-5. Agricultural product processing machine with drying principle 6-7. Agricultural product processing machine with the freezing principle 8. Midterm exam 9-11. Agricultural product processing machine with cooling principle 12-13. Agricultural product processing machine using the boiler principle 14-15. Agricultural product processing machine with the principle of a cooking furnace 16. Final Semester Exam
Examination forms	Discussion, Paper, Activity, Material analysis
Study and examination requirements	4. Minimum attendance at lectures is 80%. 5. Components consist of 20% Quiz, 20% Assignments, 30% UTS, 30% UAS 6. The final score consists of Knowledge 20%, General Ability 25%, Special Skills 50%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE:** N20A3022

Module designation	Advanced Irrigation and Drainage Engineering
Semester(s) in which the module is taught	1
Person responsible for the module	1. Dr. Ir. Edy Suryadi MT. 2. Dr.Sophia Dwiratna Nur Perwitasari S.TP., MT 3. Kharistya Amaru S.TP., MT, Ph.D.
Language	Indonesian
Relation to curriculum	Compulsory Course Master Agro-Industrial Study Program
Teaching methods	Lecture, Presentation, and Discussion
Workloads	Total workload: 124 hours **Class** Lecture: 3 x 50' x 14 weeks = 35 hours Assignment: 3 x 50' x 14 weeks = 35 hours Independent study: 3 x 70' x 14 weeks = 49 hours **Examination** Midterm Examination: 3 x 50' x 1 week = 2.5 hours Final Examination: 3 x 50' x 1 week = 2.5 hours
Credit points	3 (CREDITS)/4.8 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	6. Able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) 7. Able to make decisions in the context of solving science and technology development problems that pay attention to and apply humanities values based on studies, analysis or experiments on information and data 8. Mastering the principles of resource optimization in the application of technology 9. Mastering the latest issues regarding the development of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 10. Develop attitudes and abilities such as honesty, collaboration, cooperation and integrity 11. Demonstrate a responsible attitude towards work in their field of expertise independently
Content	1. Surface irrigation technical design

	2. Subsurface irrigation design 3-4. Bulk and drip pump irrigation design 5-6. Tidal irrigation design 7. Surface drainage design 8. Midterm exam 9. Subsurface drainage design 10. Swamp drainage design 11. Tidal drainage design. 12. Irrigation Planning Criteria 13. Discharge Measuring Water Buildings 14-15. Technical and Institutional Socio-Economic Profile in irrigation and drainage design Peak Discharge and Channel Planning in irrigation and drainage design 16. Final exams
Examination forms	Discussion, Paper, Activity, Material analysis
Study and examination requirements	1. Minimum attendance at lectures is 80%. 2. Components consist of 20% Quiz, 20% Assignments, 30% UTS, 30% UAS 3. The final score consists of Knowledge 5%, General Ability 20%, Special Skills 70%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE:** N20A1006

Module designation	Advanced Soil and Water Engineering and Water Allocation
Semester(s) in which the module is taught	2
Person responsible for the module	1. Dr. Ir. Edy Suryadi MT. 2. Kharistya Amaru S.TP., MT, Ph.D. 3. Dr. Dwi Rustam Kendarto S.Si., MT
Language	Indonesian
Relation to curriculum	Specialty Elective Courses Master of Agro-Industrial Study Program
Teaching methods	Lecture, Presentation, and Discussion
Workloads	Total workload: 124 hours **Class** Lecture: 3 x 50' x 14 weeks = 35 hours Assignment: 3 x 50' x 14 weeks = 35 hours Independent study: 3 x 70' x 14 weeks = 49 hours **Examination** Midterm Examination: 3 x 50' x 1 week = 2.5 hours Final Examination: 3 x 50' x 1 week = 2.5 hours
Credit points	3 (CREDITS)/4.8 (ECTS)
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	6. Able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) 7. Able to innovate on agricultural engineering and food technology issues for technology development 8. Able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment 9. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 10. Able to make decisions in the context of solving science and technology development problems that pay attention to and apply humanities values based on studies, analysis or experiments on information and data 11. Mastering engineering theory in agricultural and food machinery/soil and water

	engineering/post-harvest technology/food technology/food security 12. Mastering the principles of resource optimization in the application of technology 13. Acting as a citizen who is proud and loves the country, has nationalism and a sense of responsibility to the state and nation
Content	1-5. Soil preservation and water management techniques 4-9. Planning and designing soil and water preservation techniques using biological methods 10. Midterm exam 9-12. Design of soil and water preservation techniques using chemical methods 13-15. Planning techniques for preserving soil and water using mechanical methods 17. Final exams
Examination forms	Discussion, Preparing Paper, Activeness
Study and examination requirements	4. Minimum attendance at lectures is 80%. 5. Components consist of Assignments 40%, UTS 30%, UAS 30% 6. The final score consists of Knowledge 5%, General Ability 25%, Special Skills 60%, Ethics 5%
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A3024**
Module designation		Development Technology of Regional Specific Areas
Semester(s) in which the module is taught		3
Person responsible for the module		1. Dwi Rustam Kendarto 2. Boy Macklin Pareira Prawiranegara 3. Lukito Hasto Pradopo
Language		Indonesian
Relation to curriculum		Compulsory Courses
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently 2. Able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment 3. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics

	in the form of a thesis published in an accredited scientific journal 4. Able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community 5. Able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism 6. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 7. Mastering the latest issues regarding the development of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 8. Be devoted to God Almighty and be able to show a religious attitude 9. Develop attitudes and abilities such as honesty, collaboration, cooperation and integrity 10. Upholding human values in carrying out duties based on religion, morals and ethics 11. Acting as a citizen who is proud and loves the country, has nationalism and a sense of responsibility to the state and nation 12. Respect the diversity of cultures, views, religions and beliefs, as well as the original opinions or findings of others
Content	1. Regionally specific understanding of technology 2. Utilization of the latest industrial technology 3. Modification of industrial technology into applied technology 4. Identify appropriate technology 5. Region-specific independent technology development. 6. Regional Comparative and Competitive Analysis 7. Development of independent and appropriate region-specific technology 8. Business Analysis of Agro-industrial businesses

	9. Region Specific Technology based on tantric non-knowledge 10. Identification of Environmental Economic Instruments 11. Region-specific technology in an area 12. Development of region-specific technology from an environmentally friendly economic perspective
Examination forms	Assignments, Discussions, Presentations
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 10% General ability = 15% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A3026**
Module designation		Hydro-climate modeling
Semester(s) in which the module is taught		3
Person responsible for the module		1. Dr.Sophia Dwiratna Nur Perwitasari S.TP., MT 2. Dr. Dwi Rustam Kendarto S.Si., MT 3. Prof. Ir. Chay Asdak M.Sc., Ph.D. 4. Handarto STP., M.Agr., Ph.D.
Language		Indonesian
Relation to curriculum		Specialty Elective Courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) 2. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 3. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A3026
		expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal 4. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media to the academic community and the wider community 5. Mastering the principles of resource optimization in the application of technology 6. Upholding human values in carrying out duties based on religion, morals and ethics 7. Work together and have social sensitivity and concern for society and the environment
Content		1. Water need concept 2. Water demand modeling concept 3. Software applications for water demand modeling Hydrological modeling 4. Hydrological modeling in watershed management Modeling applications 5. Conceptual modeling 6. Discrete and continuous modeling 7. Dynamic modeling 8. Distributive modeling 9. Illustrations of simulations and models 10. Illustration of simulations and models II
Examination forms		Assignments, Discussions, Presentations
Study and examination requirements		Value components: Duty: 40%

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE: N20A3026**
		Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 10% General ability = 15% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list		

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A2029**
Module designation		Grains storage and handling
Semester(s) in which the module is taught		3
Person responsible for the module		1. Dr. Herlina Marta S.TP., M.Sc. 2. Prof. Dr. Ir. Mohamad Djali MS. 3. Dr. Fitry Filianty S.TP., M.Sc.
Language		Indonesian
Relation to curriculum		Specialty Elective Courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) 2. able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment 3. able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 4. able to make decisions in the context of solving science and technology development problems that pay attention to and apply humanities values based on studies, analysis or experiments on information and data

	5. master the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 6. master engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 7. master the principles of resource optimization in the application of technology 8. internalize academic values, norms and ethics
Content	1. Grain characteristics 2. Seed ripening and maturity criteria 3. Drying on grain 4. Psychometry of seed moisture content, drying principles and systems. Peeling and cleaning of seeds 5. Storage and control systems in storage Quality standardization and quality testing methods 6. Warehouse pest control 7. Design a grain storage system
Examination forms	Assignments, Discussions, Presentations
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 20% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A3026**
Module designation		Fish and Animal products storage and handling
Semester(s) in which the module is taught		3
Person responsible for the module		Robi Andoyo S.TP., M.Sc., Ph.D. Dr. Souvia Rahimah S.TP., M.Sc.
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 2. Able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment 3. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal 4. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media

	to the academic community and the wider community 5. Able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community 6. Mastering the principles of resource optimization in the application of technology 7. Mastering the latest issues regarding the development of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 8. Internalize the spirit of independence, struggle and entrepreneurship 9. Develop attitudes and abilities such as honesty, collaboration, cooperation and integrity 10. Contribute to improving the quality of life in society, nation, state and civilization based on Pancasila
Content	1. Characteristics of meat commodities 2. Quality criteria and methods for assessing livestock products 3. Withering slaughter and butchering of meat 4. Meat spoilage and how to control it 5. Meat storage and preservation 6. Characteristics of milk and eggs 7. Milk processing with standardization, separation, clarification, homogenization and 8. pasteurization sterilization Damage to milk and how to control it 9. Egg processing and storage 10. Application of preserving marine products in the fishing process 11. Application of preserving marine products to become industrial raw materials 12. Application of preserving seafood until consumers are fresh
Examination forms	Assignments, Discussions, Presentations
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30%

	referring to the PLO: Knowledge = 5% General ability = 15% Special skills =75% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A3031**
Module designation		Post harvest agricultural product storage and handling
Semester(s) in which the module is taught		3
Person responsible for the module		1. Dr. S. Rosalinda ST, MT 2. Dr. Rossi Indiarto S.TP., MP 3. Dr. Heni Radiani Arifin STP, MP
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		11. able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently 12. able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 13. able to make decisions in the context of solving science and technology development problems that pay attention to and apply humanities values based on studies, analysis or experiments on information and data 14. master the principles of resource optimization in the application of technology 15. act as citizens who are proud and love their country, have nationalism and a

	sense of responsibility to the state and nation
Content	1. Pre-manufacturing activities on coffee tea and chocolate 2. Pre-manufacturing activities on coconut and oil palm 3. Pre-manufacturing activities in rubber and sugar cane 4. Coffee and chocolate tea manufacturing activities 5. Coconut and palm oil manufacturing activities 6. Rubber and sugar cane manufacturing activities 7. Post-manufacturing activities for tea coffee and chocolate 8. Coconut and palm oil post-manufacturing activities 9. Rubber and sugar cane post-manufacturing activities 10. The influence of material components on the formation of product quality 11. Processing plantation commodities 12. Analysis of changes that occur during the processing process
Examination forms	Assignments, Discussions, Presentations
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 20% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A3032**
Module designation		Agricultural Product Packaging
Semester(s) in which the module is taught		3
Person responsible for the module		1. Dr. Souvia Rahimah S.TP., M.Sc. 2. Dr. Efri Mardawati S.TP., MT 3. Dr. Vira Putri Yarlina STP, M.Sc.
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Assignments, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently 2. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 3. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 4. Able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community 5. Mastering the principles of developing agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security

	6. Mastering the principles of resource optimization in the application of technology 7. Internalize the spirit of independence, struggle and entrepreneurship
Content	1. Packaging of agricultural commodities 2. Packing agricultural commodities at the harvest stage 3. Packaging of agricultural commodities at the post-harvest stage 4. Handling of agricultural commodities in the packing ward 5. Strength, shape, size and packaging materials for agricultural commodities 6. Packaging for whole sale retail
Examination forms	Assignments, Discussions, Presentations
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 20% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A3037**
Module designation		Food processing technology of plantation products
Semester(s) in which the module is taught		3
Person responsible for the module		1. Prof. Dr. Ir. Mohamad Djali MS. 2. Dr. Efri Mardawati S.TP., MT 3. Dr. Rossi Indiarto S.TP., MP 4. Dr. Elazmanawati Lembong STP., M.Si.
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Exposure to material Discussion Question and answer
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently 2. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 3. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media to the academic community and the wider community

	4. Able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach 5. Able to make decisions in the context of solving science and technology development problems that pay attention to and apply humanities values based on studies, analysis or experiments on information and data 6. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 7. Mastering the principles of developing agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 8. Contribute to improving the quality of life in society, nation, state and civilization based on Pancasila 9. Acting as a citizen who is proud and loves the country, has nationalism and a sense of responsibility to the state and nation 10. Respect the diversity of cultures, views, religions and beliefs, as well as the original opinions or findings of others
Content	1. Tea Coffee and Cocoa as refreshing drink ingredients, types of refreshing ingredients - the development of world tea and its prospects in Indonesia as well as the development of Extract Powder Technology and Encapsulated instant tea 2. quality of types of coffee, active components in coffee beans, wet and dry processing of coffee and Luwak coffee, processing roasted coffee beans into processed products, how to serve processed coffee products Fermentation and drying of cocoa beans, quality control and classification, processing of cocoa into

	chocolate chocolate bar making, chocolate coating, chocolate packaging
Examination forms	Task
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 20% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A3038**
Module designation		Friuts and vegetable processing technology
Semester(s) in which the module is taught		3
Person responsible for the module		1. Prof. Dr. Ir. Mohamad Djali MS. 2. Dr. Rossi Indiarto S.TP., MP 3. Dr. Souvia Rahimah S.TP., M.Sc.
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment 2. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal 3. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media to the academic community and the wider community

	4. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 5. Contribute to improving the quality of life in society, nation, state and civilization based on Pancasila 6. Acting as a citizen who is proud and loves the country, has nationalism and a sense of responsibility to the state and nation
Content	1. Syllabus and materials at each meeting in general 2. Characteristics of vegetables and fruit 3. Fruit processing 4. Processing vegetables and fruit from various references 5. Freezing in processing vegetables and fruit 6. Grading and quality standards for vegetables and fruit 7. Quality standards 8. Quality standards for vegetables and fruit are based on SNI 9. Quality standards for vegetables and fruit are based on SNI II 10. Natural branding in vegetable and fruit processing 11. Fruit and vegetables active packaging 12. Active packaging
Examination forms	Task Discussion Presentation
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 15% Special skills =75% Ethics = 5% Minimum attendance requirement is 80% of total lectures.

Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A3040
Module designation		Food Quality Assurance
Semester(s) in which the module is taught		3
Person responsible for the module		1. Dr. Souvia Rahimah S.TP., M.Sc. 2. Yana Cahyana S.TP., DEA., Ph.D. 3. Prof. Dr. Ir. Sumanti Debby Moody MS 4. Dr. Boy Macklin Pareira Prawiranegara ST, M.Sc.
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently 2. Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development 3. Able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism 4. Mastering engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE: N20A3040**
		5. Contribute to improving the quality of life in society, nation, state and civilization based on Pancasila 6. Demonstrate a responsible attitude towards work in their field of expertise independently
Content		1. Food quality control and food safety management system 2. Good Practices Tracebility GAP GHP and GMP management system 3. Good Practices Traceability GDP and Transportation management system 4. Risk analysis in sanitary and pythosanitary SPS measures 5. ISO 9000 6. Predictive microbiology 7. HACCP system 8. ISO 22000 9. Application of HACCP in the food industry
Examination forms		Task Discussion Presentation
Study and examination requirements		Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 20% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list		

	PADJADJARAN UNIVERSITY **FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY** **MASTER AGRO-INDUSTRIAL STUDY PROGRAM**	**COURSE CODE: N20A3041**

Module designation	Enzymes and microbial technology
Semester(s) in which the module is taught	3
Person responsible for the module	1. Dr. Tita Rialita S.Si., M.Si 2. Bambang Nurhadi STP., MSc., PhD 3. Tri Yuliana S.Si., M.Sc., Ph.D.
Language	Indonesian
Relation to curriculum	Elective courses
Teaching methods	Lectures, Discussions, Presentations
Workloads	Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points	4.8 ECTS
Required and recommended prerequisites for joining the module	-
Module objectives/intended learning outcomes	1. Able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment 2. Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal 3. Mastering the principles of developing agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security 4. Develop attitudes and abilities such as honesty, collaboration, cooperation and integrity
Content	1. Enzyme concepts and theory 2. Enzyme immobilization

	3. Enzyme activity in food 4. Application of enzymes in starch modification 5. Application of enzymes in protein modification 6. Application of enzymes in protein modification II 7. Enzyme division 8. Cellulase and amylase enzymes 9. Protease and lipase enzymes 10. Strain development in the form of protoplast mutations and GMOs 11. Application of enzymes in the production of high value foodstuffs 12. Microbial applications in the production of high value foodstuffs
Examination forms	Task Discussion Presentation
Study and examination requirements	Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 20% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A3042**
Module designation		Applied Nanotechnology in food industry
Semester(s) in which the module is taught		3
Person responsible for the module		1. Robi Andoyo S.TP., M.Sc., Ph.D. 2. Bambang Nurhadi STP., MSc., PhD 3. Dr. Siti Nurhasanah S.TP., M.Si. 4. Dr. Heni Radiani Arifin STP, MP
Language		Indonesian
Relation to curriculum		Elective courses
Teaching methods		Lectures, Discussions, Presentations
Workloads		Total workload: 124 hours **Class** Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3 x 70'x 14 weeks = 49 hours **Examination** Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8 ECTS
Required and recommended prerequisites for joining the module		-
Module objectives/intended learning outcomes		1. Able to innovate on agricultural engineering and food technology issues for technology development 2. Able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment 3. Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media to the academic community and the wider community 4. Mastering the latest issues regarding the development of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A3042**
		5. Upholding human values in carrying out duties based on religion, morals and ethics
Content		1. Nanotechnology concepts and theories 2. Size in material 3. Size in particles 4. Application of nanotechnology in various cases 5. Drying for nano emulsion 6. Formation of nano emulsions 7. Comparison of weights in emulsions 8. Nano materials in packaging 9. Nano material as active packaging and smart packaging 10. Nanotechnology techniques on the characteristics of food ingredients 11. Application of nanotechnology in various food industries
Examination forms		Task Discussion Presentation
Study and examination requirements		Value components: Duty: 40% Midterm Examination: 30% Final Examination: 30% referring to the PLO: Knowledge = 5% General ability = 20% Special skills =70% Ethics = 5% Minimum attendance requirement is 80% of total lectures.
Reading list		

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY	**COURSE CODE: N20A3043**

	MASTER AGRO-INDUSTRIAL STUDY PROGRAM	
Module designation		Food Toxicology
Semester(s) in which the module is taught		3
Person responsible for the module		Yana Cahyana, Mahani, Aldila Din Pangawikan
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently • able to formulate alternative solutions to agricultural engineering and food technology problems for technology development • Able to carry out academic validation or studies according to their field of expertise in solving problems in society or relevant industry through developing their knowledge and expertise • able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism • master engineering theory in agricultural and food machinery/soil and water engineering/post-harvest

	technology/food technology/food security • contribute to improving the quality of life in society, nation, state and civilization based on Pancasila • act as citizens who are proud and love their country, have nationalism and a sense of responsibility to the state and nation
Content	Food toxicology Relationships and phases of toxicity Factors causing toxicity Epidermology Physiology and digestive tract Metabolism and excretion Toxic and toxic chemicals in food Sources and mechanisms of poisoning Foodborne disease and food poisoning Industrial toxicology Source of contamination Indicator microbes in food toxicology
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Tasks : 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 5%** **General ability: 15%** **Special Ability: 75%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE : UNX998**
Module designation		Thesis
Semester(s) in which the module is taught		
Person responsible for the module		Dwi Rustam Kendarto
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 83 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• internalize the spirit of independence, struggle and entrepreneurship • develop attitudes and abilities such as honesty, collaboration, cooperation and integrity • contribute to improving the quality of life in society, nation, state and civilization based on Pancasila • internalize academic values, norms and ethics • demonstrate a responsible attitude towards work in their

	field of expertise independently
Content	Writing scientific papers
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Referring to PLO:** **Knowledge: 20%** **General ability:20%** **Special Ability: 10%** **Ethics: 40%**

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A1001**
Module designation		Agro-Industry Development Strategy
Semester(s) in which the module is taught		2
Person responsible for the module		Lukito Hasto Pradopo, Edy Suryadi, Dwi Rustam Kendarto,
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 83 hours Class Lecture: 2 x 50'x 14 weeks = 23 hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 2x70'x14 weeks = 33 hours Examination Midterm Examination: 2x50'x1 weeks = 1.67 hours Final Examination: 2x50'x1 weeks = 1.67 hours
Credit points		3.2ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) • able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment • Able to develop logical, critical, systematic and

	creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal • able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, and communicate them through the media to the academic community and the wider community • able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach • able to make decisions in the context of solving science and technology development problems that pay attention to and apply humanities values based on studies, analysis or experiments on information and data • able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community • master the principles of developing agricultural and food machinery/soil and water engineering/post-

	harvest technology/food technology/food security • master the principles of resource optimization in the application of technology • contribute to improving the quality of life in society, nation, state and civilization based on Pancasila • internalize academic values, norms and ethics • demonstrate a responsible attitude towards work in their field of expertise independently
Content	Agro-industry concepts and theories Potential agro-industrial policy strategies and their influence on the development of the upstream and downstream agricultural sectors Agro-industrial actors in the value chain theory of production systems including logistics guarantees and distribution management Marketing management and customer service as well as CSR applications Added value of commodities, product competitiveness, creation of job opportunities Institutions or organizations in the agro-industrial sector Problems and challenges in the agro-industrial sector and being able to find alternative solutions. Strategies for developing agro-industry on a household scale Agro-industry development based on local excellence LQ method in preparing Agro-industrial Development strategies Agro-industry development strategy with SWOT analysis Financial aspects and government policies in

	supporting the development of the Agro-industrial sector
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Duty: 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 45%** **General ability:25%** **Special Abilities: 25%** **Ethics: 5%**

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A1002**
Module designation		Agro-industrial System Analysis
Semester(s) in which the module is taught		2
Person responsible for the module		Gemilang Lara Utama, Roni Kastaman, Boy Macklin Pareira Prawiranegara, Dwi Purnomo,
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 83 hours Class Lecture: 2 x 50'x 14 weeks = 23 hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 2x70'x14 weeks = 32 hours Examination Midterm Examination: 2x50'x1 weeks = 1.67hours Final Examination: 2x50'x1 weeks = 1.67 hours
Credit points		3.2ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) • able to innovate on agricultural engineering and food technology issues for technological development

	• able to build a work network and foster a sustainable entrepreneurial spirit. • Able to carry out academic validation or studies according to their field of expertise in solving problems in society or relevant industry through developing their knowledge and expertise • able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach • able to make decisions in the context of solving science and technology development problems that pay attention to and apply humanities values based on studies, analysis or experiments on information and data • able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community • master the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • master the principles of developing agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security

	• master the principles of resource optimization in the application of technology • devoted to God Almighty and able to show a religious attitude • contribute to improving the quality of life in society, nation, state and civilization based on Pancasila • work together and have social sensitivity and concern for society and the environment • law-abiding and disciplined in social and state life
Content	Characteristics and classification of systems Agro-industry as a system includes agro-industrial system elements, process input and agro-industrial output. Dynamic and stochastic static systems in agro-industry static systems dynamic programs dynamic systems stochastic systems. Location Selection Determination of Location and development of Business Locations in the agro-industrial sector Economic Analysis Numerical Model GIS-MDA Multicriteria Analysis and MDCM Multicriteria Decision Making System modeling Spatial Analysis System SDALH Management Planning Instrument and its application Industrial Ecological Systems

	A conceptual system based on the industrial ecology of the Kalundborg System
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Duty: 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 45%** **General ability:25%** **Special Abilities: 25%** **Ethics: 5%**

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N20A1004**
Module designation		Advanced Optimization Techniques
Semester(s) in which the module is taught		2
Person responsible for the module		Handarto, Robi Andoyo,
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 83 hours Class Lecture: 2 x 50'x 14 weeks = 23hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 3x70'x14 weeks = 32 hours Examination Midterm Examination: 2x50'x1 weeks = 1.67 hours Final Examination: 2x50'x1 weeks = 1.67 hours
Credit points		3.2ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment • able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community • master the principles of resource optimization in the application of technology • law-abiding and disciplined in social and state life

	• internalize academic values, norms and ethics
Content	Production operations research Linear programming and sensitivity analysis Simplex method and abnormal conditions Dynamic programs Production transportation model Production networks in agro-industrial systems Assignment method PERT and CPM programs Production queue analysis Application of various methods of agricultural operations and production research
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Tasks : 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 5%** **General ability: 40%** **Special Abilities: 50%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A1005
Module designation		Measurement and Instrumentation
Semester(s) in which the module is taught		2
Person responsible for the module		Mimin Muhaemin, Handarto,
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 83 hours Class Lecture: 2 x 50'x 14 weeks = 23hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 3x70'x14 weeks = 32 hours Examination Midterm Examination: 2x50'x1 weeks = 1.67 hours Final Examination: 2x50'x1 weeks = 1.67 hours
Credit points		3.2ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to formulate alternative solutions to agricultural engineering and food technology problems for technology development • able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism • master the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security

	• internalize the spirit of independence, struggle and entrepreneurship
Content	Basic principles of measurement and instrumentation Basic principles of electronic measurement Basic principles in transducer selection Applications about basic circuits for signal conditioning Techniques for measuring thermal and chemical mechanical parameters Recording instrument concept Data acquisition system Measurement errors and their control Application of measurement in agro-industry
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Tasks : 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 20%** **General ability: 25%** **Special Abilities: 50%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A2009
Module designation		Agro-industrial Machinery and Equipment
Semester(s) in which the module is taught		2
Person responsible for the module		
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 83 hours Class Lecture: 2 x 50'x 14 weeks = 23hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 3x70'x14 weeks = 32 hours Examination Midterm Examination: 2x50'x1 weeks = 1.67 hours Final Examination: 2x50'x1 weeks = 1.67 hours
Credit points		3.2ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) • able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis

	based on analytical, computational, or experimental approaches independently • able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community • master engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • work together and have social sensitivity and concern for society and the environment
Content	Use of agro-industrial machines and equipment The relationship between the physical properties of materials and machines Principles and working mechanisms of post-harvest machines Principles and working mechanisms of food processing machines Post-harvest machine calculations Calculation of food processing machines Operation and adjustment of power requirements on post-harvest machines Operation and adjustment of power requirements on food processing machines Maintenance and economic analysis of use of post-harvest machines Maintenance and economic analysis of use of food processing machines
Examination forms	Lecture Case study Presentation

Study and examination requirements	**Assessment Details:** **Tasks : 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 5%** **General ability: 40%** **Special Abilities: 50%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A2015
Module designation		Greenhouse Technology
Semester(s) in which the module is taught		3
Person responsible for the module		
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) • able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment • able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community

	• master engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • develop attitudes and abilities such as honesty, collaboration, cooperation and integrity • respect the diversity of cultures, views, religions and beliefs, as well as the original opinions or findings of others
Content	Influence of physical and environmental factors on plant growth Application of modification of the thermodynamic properties of air in a greenhouse Development of greenhouse technology
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Tasks : 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 15%** **Special Abilities: 80%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE: N20A3018
Module designation		Machine Dynamics
Semester(s) in which the module is taught		3
Person responsible for the module		
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to formulate alternative solutions to agricultural engineering and food technology problems for technology development • able to innovate on agricultural engineering and food technology issues for technological development • Able to carry out academic validation or studies according

	to their field of expertise in solving problems in society or relevant industry through developing their knowledge and expertise • master the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • master the principles of developing agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • internalize the spirit of independence, struggle and entrepreneurship
Content	Principles of machine dynamics Free and forced engine vibration Critical speed and torsional vibration of the shaft Machine balance Cam cam mechanism Momentary center on the machine Force analysis on machine components
Examination forms	Lecture

	Case study Presentation
Study and examination requirements	**Assessment Details:** **Tasks : 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 15%** **Special Abilities: 80%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE : UNX680
Module designation		Statistical Analysis
Semester(s) in which the module is taught		2
Person responsible for the module		Edy Suryadi, Dwi Rustam Kendarto, Mohamad Djali,
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 83 hours Class Lectures 2 x 50'x 14 weeks = 23 hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 2x70'x14 weeks = 33hours Examination Midterm Examination: 2x50'x1 weeks = 1.67 hours Final Examination: 2x50'x1 weeks = 1.67 hours
Credit points		3.2ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources)

	• able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently • Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal • Able to carry out academic validation or studies according to their field of expertise in solving

	problems in society or relevant industry through developing their knowledge and expertise • able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach • KU7 is able to increase learning capacity independently • master the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • master engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • master the principles of resource optimization in the application of technology

	• contribute to improving the quality of life in society, nation, state and civilization based on Pancasila • internalize academic values, norms and ethics • demonstrate a responsible attitude towards work in their field of expertise independently
Content	Constraint planning and experiment basics Simple multiple partial and partial-multiple regression and correlation analysis Simple multiple partial and partial-multiple correlation analysis in research Non-linear regression applications Comparative test of simple and multiple regression and correlation Analysis of completely randomized design multiple comparisons and relative efficiency in Randomized Block Design and Square Design research Factorial and fractional factorial experiments Split plot design split block design split-split plot design split plot analysis in space and time analysis of experimental series Non-parametric statistical analysis and its use in research Multivariate statistics Software as an analytical tool in solving problems in research
Examination forms	Lecture

	Case study Presentation
Study and examination requirements	**Assessment Details:** **Tasks : 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 15%** **Special Abilities: 80%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE : UNX692**
Module designation		Science phylosophy
Semester(s) in which the module is taught		2
Person responsible for the module		Chay Asdak
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 83 hours Class Lectures 2 x 50'x 14 weeks = 23 hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 2x70'x14 weeks = 33hours Examination Midterm Examination: 2x50'x1 weeks = 1.67 hours Final Examination: 2x50'x1 weeks = 1.67 hours
Credit points		3.2ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• Able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently • Able to formulate alternative solutions to agricultural engineering and food technology problems for technology development • Able to develop logical, critical, systematic and creative thinking through

	scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal • Ampu carries out academic validation or studies according to his field of expertise in solving problems in society or relevant industry through developing his knowledge and expertise • Able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, as well as communicate them through the media to the academic community and the wider community • Mastering the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • Be devoted to God Almighty and be able to show a religious attitude • Develop attitudes and abilities such as honesty, collaboration, cooperation and integrity • Upholding human values in carrying out duties

	based on religion, morals and ethics • Contribute to improving the quality of life in society, nation, state and civilization based on Pancasila • Respect the diversity of cultures, views, religions and beliefs, as well as the original opinions or findings of others • Internalize academic values, norms and ethics
Content	Philosophy as the mother of science Characteristics of philosophical thinking Branch of philosophy The relationship between systematic philosophical thinking, holistic critical analysis in the agricultural industry, the phenomenon of local and modern knowledge Paradigm science and empirical-rational approaches History of philosophy from abroad and within the country Philosophical concepts from an Islamic perspective Logic as a way of philosophical thinking Model of scientific propositions and the concept of plagiarism Epistemology, Ontology and Axiology and their implications for Science, Logic, Inductive-Deductive, Ratio-Empirical, Hypothesis, Futurology and its relation to science
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Tasks : 40%** **UTS: 30%** **UAS: 30%**

	Referring to PLO: **Knowledge: 65%** **General Knowledge: 15%** **Special Abilities: 15%** **Ethics: 5%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE : UNX693
Module designation		Research Methodology
Semester(s) in which the module is taught		2
Person responsible for the module		Chay Asdak, Roni Kastaman, Sumanti Debby Moody, Bambang Nurhadi,
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 83 hours Class Lecture: 2 x 50'x 14 weeks = 23 hours Assignment: 2 x 50'x 14 weeks = 23 hours Independent study: 2x70'x14weeks = 33 hours Examination Midterm Examination: 2x50'x1 weeks = 1.67 hours Final Examination: 2x50'x1 weeks = 1.67 hours
Credit points		3.2ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to design, develop and evaluate engineering principles, management and technology to solve integrated agricultural engineering or food technology problems (including human, biological, material, equipment and information resources) • able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently

	• able to formulate alternative solutions to agricultural engineering and food technology problems for technology development • able to develop the field of agricultural engineering or food technology by considering developments in science and technology and the environment • Able to develop logical, critical, systematic and creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal • Able to carry out academic validation or studies according to their field of expertise in solving problems in society or relevant industry through developing their knowledge and expertise • able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, and communicate them through the media to the academic community and the wider community • able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism • master the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest

	technology/food technology/food security • master engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • master the principles of developing agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • internalize the spirit of independence, struggle and entrepreneurship • upholding human values in carrying out duties based on religion, morals and ethics • internalize academic values, norms and ethics • demonstrate a responsible attitude towards work in their field of expertise independently
Content	Identify and be able to formulate problems Formulate good research goals and objectives Quantitative and qualitative research Purely applied research and evaluation Descriptive and Explanatory Research Experimental and Non-Experimental Research Expo Facto Survey Case Study Action Research Formulate research methods according to the problem and objectives Research variables and able to use research instruments Determining appropriate research methods Questionnaire sampling method in research and being able to analyze statistical data. Research method

	in pre-proposal writing accompanied by the use of anti-plagiarism rules
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Referring to PLO:** **Knowledge: 30%** **General ability: 35%** **Special Ability: 10%** **Ethics: 25%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	COURSE CODE : UNX796
Module designation		Research Proposal Seminar
Semester(s) in which the module is taught		
Person responsible for the module		Dwi Rustam Kendarto
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to find the source of problems in agricultural engineering or food technology through the process of observation, interpretation of data and information, problem formulation, and analysis based on analytical, computational, or experimental approaches independently • able to formulate alternative solutions to agricultural engineering and food technology problems for technology development • Able to develop logical, critical, systematic and

	creative thinking through scientific research, creating designs or works of art in the fields of science and technology that pay attention to and apply humanities values according to their field of expertise, compiling scientific conceptions and study results based on rules, procedures and scientific ethics in the form of a thesis published in an accredited scientific journal • Able to carry out academic validation or studies according to their field of expertise in solving problems in society or relevant industry through developing their knowledge and expertise • able to compile ideas, thoughts and scientific arguments responsibly and based on academic ethics, and communicate them through the media to the academic community and the wider community • able to identify the scientific field that is the object of research and position it in a research map developed through an inter- or multi-disciplinary approach • able to document, store, secure and retrieve research data in order to ensure validity and prevent plagiarism • master the theoretical concepts and applications of agricultural and food machinery/soil and water engineering/post-harvest

	technology/food technology/food security • master engineering theory in agricultural and food machinery/soil and water engineering/post-harvest technology/food technology/food security • internalize the spirit of independence, struggle and entrepreneurship • internalize academic values, norms and ethics • demonstrate a responsible attitude towards work in their field of expertise independently
Content	Techniques for writing scientific manuscripts in the form of theses and scientific articles to be presented in scientific journals. Research proposal and thesis format. Scientific work presentation techniques. Writing research proposals and conducting research proposal seminars in front of the supervisory commission and other students. Before Carrying out Research Proposal Seminars is required to attend a minimum of 5 Research Proposal Seminars in a relevant study program/field of science.
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Referring to PLO:** **Knowledge: 40%** **General ability: 15%** **Special Abilities: 5%** **Ethics: 40%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE : UNX796**
Module designation		Energy Food
Semester(s) in which the module is taught		3
Person responsible for the module		Dwi Rustam Kendarto
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 124 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• able to formulate alternative solutions to agricultural engineering and food technology problems for technology development • able to innovate on agricultural engineering and food technology issues for technological development • able to make decisions in the context of solving science and technology development problems that pay attention to and apply humanities values based on studies, analysis or experiments on information and data

	• able to manage, develop and maintain working networks with colleagues, colleagues within the institution and the wider research community • master the principles of resource optimization in the application of technology • contribute to improving the quality of life in society, nation, state and civilization based on Pancasila • act as citizens who are proud and love their country, have nationalism and a sense of responsibility to the state and nation • respect the diversity of cultures, views, religions and beliefs, as well as the original opinions or findings of others
Content	General Concepts and Explanations Regarding Food, Water and Energy Availability Systems Problems regarding food, energy and water and their interrelationships in an integrated system Impact of problems availability of food, energy and locally and globally Food, energy and water policies and their relationship to sustainable development Strong and weak sustainability concepts with relevant applications for agribusiness/cultivation, primary energy supply and water supply UTS / Assignments Urbanization and its impact on resource demand and

	associated impacts on land use, emissions and society Political, cultural and technological drivers of food, water and energy systems in historical perspective on future development Planning for further studies in the food, energy and water sectors UAS / Presentation
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Referring to PLO:** **Knowledge: 40%** **General ability: 15%** **Special Abilities: 5%** **Ethics: 40%**
Reading list	

	PADJADJARAN UNIVERSITY FACULTY OF AGRO-INDUSTRIAL TECHNOLOGY MASTER AGRO-INDUSTRIAL STUDY PROGRAM	**COURSE CODE: N10B225**
Module designation		Biological Evaluation of Food Components
Semester(s) in which the module is taught		3
Person responsible for the module		1. Yana Cahyana, STP., M.Sc. DEA. 2. Bambang Nurhadi, STP., M.Sc., Ph.D.
Language		Indonesian
Relation to curriculum		Compulsory Courses Master of Agro-Industrial Study Program
Teaching methods		1. Lecture, discussion, questions and answers 2. Exploration
Workloads		Total workload: 83 hours Class Lecture: 3 x 50'x 14 weeks = 35 hours Assignment: 3 x 50'x 14 weeks = 35 hours Independent study: 3x70'x14 weeks = 49 hours Examination Midterm Examination: 3x50'x1 weeks = 2.5 hours Final Examination: 3x50'x1 weeks = 2.5 hours
Credit points		4.8ECTS
Required and recommended prerequisites for joining the module		
Module objectives/intended learning outcomes		• Have a moral attitude and behavior, honest, responsible, disciplined, high morale/work ethic, independent, creative, always give the best, and respect all work • Have the ability to be intelligent, tenacious, dynamic, highly motivated, responsible, cooperative, self-introspective, visionary, respect differences and prioritize state interests above personal or group interests Master the basics and principles of science related to food science and technology, which includes chemistry ,

	microbiology, engineering and food processing technology. • Able to identify the characteristics of food ingredients and analyze chemical properties, physical properties, microbiological properties, functional properties and sensory properties. • Able to evaluate the nutrition and functional components of food ingredients
Content	1. Overview and PBL 2. Absorption and metabolism of food components 3. Bioavailability and influencing factors 4. Measuring bioavailability 5. Bioavailability of macro, micro and polyphenol components 6. Strategy to increase bioavailability
Examination forms	Lecture Case study Presentation
Study and examination requirements	**Assessment Details:** **Tasks : 40%** **UTS: 30%** **UAS: 30%** **Referring to PLO:** **Knowledge: 5%** **General ability: 15%** **Special Ability: 75%** **Ethics: 5%**
Reading list	Main : 1. Alesecyev.V. 1960. Quantitative Analysis. Foreign Languages. Publishing House, Moscow. 2. Day, RA and Underwood AL 1974. Quantitative Analysis. Prentice Hall, Inc. Englewood Cliffs, New Jersey. 3. Fisher, R.B. 1959. A Basic Course in the Theory and Practice of Quantitative

	Chemical Analysis. WB Saunders Company, London. Supporters: 1. Food Chemistry. Phenema