



CURRICULUM

Study Program of Agricultural Product Technology

Faculty of Agriculture
University of Mulawarman
Samarinda

2025

**CURRICULUM OF STUDY PROGRAMS
AGRICULTURAL PRODUCTS TECHNOLOGY
UNDERGRADUATE PROGRAM (S1)**



**FACULTY OF AGRICULTURE
MULAWARMAN UNIVERSITY
2025**

A. Identity of Study Program

1.	College	Mulawarman University
2.	Faculty	Agriculture
3.	Study Programs	Agricultural Products Technology
4.	Study Program Code	41231
	Strata	S1
6.	Graduate Degree	Bachelor of Agricultural Technology (S.T.P)
7.	Address	Integrated Lab Building Jl. Tanah Grogot, Gunung Kelua Campus, Mulawarman University, Samarinda
8.	Phone No.	082119930460
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10.	Website	http://yin.thp.unmul.ac.id/
11.	Year and Permit/Decree of Establishment and the last Renewal Decree.	Establishment of PS THP in 2004 (No. 1364/D/T/2004) Extension of PS THP in 2006 (No. 2185/D/T/2006)
12.	Year and Number of Accreditation Decree of BAN PT and or LAM (last Decree)	Very Good Year 2023-2028 No. 3631/SK/BAN-PT/Ak/S/IX/2023
13.	Year and Name of International Accreditation/Certification Decree	(2025) Accreditation Agency for Degree Programmes in Engineering, Computer Science, Natural Sciences and Mathematics (ASIIN)

B. Curriculum Evaluation and Needs Analysis

Curriculum evaluation is carried out to ensure the suitability of graduates for the needs of the world of work and industry, for the development of science and technology, and for national policies on higher education. Evaluations are carried out periodically to maintain academic quality and ensure that each graduate has competencies in accordance with the established profile. The current curriculum aligns with the MBKM program set by the Ministry of National Education in the last period and has been implemented since 2022. The 2022 curriculum has begun producing graduates in accordance with the set standards. Currently, the evaluation needs to be carried out by considering the following things:

1. Results and recommendations for ASIIN international accreditation to be carried out in 2024
2. The latest learning curriculum policy based on Outcome-Based Education (OBE)
3. Input from stakeholders
4. Tracer study / Stakeholder satisfaction survey, graduate users, alums, and students

The international accreditation process (ASIIN), scheduled for 2024, aims to strengthen the internal quality assurance system, enhance graduates' competitiveness, and improve the quality of international-standard education. One result of the ASIIN accreditation process is an adjustment to the course credit load. Courses in the Agricultural Product Technology Study Program (PS THP) have a small number of credits (2 credits), which makes them less effective in achieving *student learning outcomes*. Small credit adjustments are recommended to be larger (3-4 credits) to increase the depth of the material and the effectiveness of learning in achieving *learning outcomes*. The evaluation of the study program's learning is carried out in accordance with Permendikbudristek Number 53 of 2023, which emphasizes the implementation of Outcome-Based Education (OBE), in which graduate learning outcomes (CPL) serve as the center for the design and implementation of education. All elements of the curriculum, such as setting graduate profiles, course design, teaching methods, and assessments, are aimed at ensuring the linkage between CPL, learning experience, and the competencies produced, so that graduates have abilities that are relevant to the demands of the world of work, the development of science and technology, as well as national and international standards.

PS THP actively involves various stakeholders in the curriculum evaluation process through *Focus Group Discussion* (FGD) activities. This FGD presents *stakeholders*, graduate users, alumni, and students to provide relevant input so that the curriculum implemented is always in line with the development of science and the needs of the world of work. The results of the discussion showed the need to improve communication skills, mastery of foreign languages, especially English, as well as to strengthen students' interests, mental attitudes, and entrepreneurial competence. The input also emphasized the importance of developing *other soft skills* that support entrepreneurship, such as creativity, leadership, time management, and the ability to

build professional networks. In addition, *stakeholders* recommend increasing the proportion of practice-based learning so that students gain more practical experience and are better prepared to face real challenges in the food industry. Thus, curriculum development is directed at equipping THP PS graduates not only with technical competence but also with entrepreneurial character, global communication skills, and high competitiveness at the national and international levels.

A tracer study is carried out by filling out the UPT Perkasa Unmul (<http://perkasa.unmul.ac.>) website, as well as by socializing with alumni through alumni associations and during the judiciary. The results of the tracer study showed that the waiting time for graduates (94 respondents) to get their first job was less than 6 months on average, with 62.11% working in accordance with the competence of PS THP and 31.58% becoming entrepreneurs or creating innovations. Based on the results of the graduate user satisfaction survey, 75% are very satisfied with the ethics of THP alumni, and 75% of graduate users stated that their expertise in the field of main competency science (BI) is at a good level. Graduate users also stated that alumni have the ability to work in a team and communicate as well as 75% or very well. Input related to the type of graduate ability that needs to be improved, namely in foreign discussion skills, users provide a 50% satisfaction level at a good and adequate level.

Based on the results of the FGD with stakeholders and ASIN's recommendations, it is necessary to improve the 2022 PS THP curriculum. Improvements were made in the form of evaluation of graduate profiles, changes in learning outcomes, study materials, changes and combinations of courses, changes in credit weights, changes in semester placement, as well as RPS and lecture materials.

Results of Curriculum Implementation Evaluation

The ongoing 2022 curriculum is prepared to meet the Indonesian National Qualifications Framework and adjusted to the curriculum classification based on professional organizations in the field of Food Science and Technology/Agricultural Product Technology (Indonesian Food Technology Experts Association). In 2024, the THP Study Center will receive recommendations on the results of the implementation of ASIIN accreditation regarding curriculum adjustments and their implementation in the THP Study Program. Changes in the Graduate Profile (PL) and Graduate Learning Outcomes (CPL) affect changes in the Formation of Study Materials and Designated Courses. Course changes are related to additions, name adjustments, mergers, and adjustments to semester placement with the following recapitulation:

Table 1. Results of the adjustment of the THP PS course

Course Name	Remarks
Cell Biology	Change of the name of the MK
Physics of Agricultural Products	Semester shifts
Professional ethics	Addition of MK
Agricultural Product Quality Management	Merger of MK and expansion of SKS
Tools and Machinery	Semester shifts

Introduction to Artificial Intelligence	Addition of a new MK
Agricultural Chemistry II and Physical Chemistry	Merger of the Constitutional Court
Chemical Analysis of Agricultural Products	Combination of analytical chemistry and AKHP
Agricultural Product Chemical Analysis Practicum	Constitutional Court Changes
Food Processing Technology and Agricultural Products	Merger of MK and expansion of SKS
Industrial Microbiology	Change of the name of the Constitutional Court and enlargement of the SKS
Humid Tropical Spice and Herbs Technology	Merger of the Constitutional Court and Replacement of the Constitutional Court
Professional Ethics	New courses
Engineering Economics	Semester shifts
Flour, Cake, and Bread Technology	Merger of the Constitutional Court and Replacement of the Constitutional Court
Humid Tropical Product Technology	Addition of a new MK
Product Innovation and Marketing	Change of the name of the Constitutional Court and change of the SKS
Selected Topic 1	Addition of a new MK
Selected Topic 2	Addition of a new MK
Selected Topic 3	Addition of a new MK
Industrial Internship	Addition of a new MK
Independent Project	Addition of a new MK

C. Foundations of Curriculum Development

This learning innovation, based on excellence and local wisdom, is based on six principles, namely:

1. Centered on the potential, development, needs, and interests of students and their environment. The curriculum is developed on the principle that students have a central role in developing their competencies to become human beings who believe in and fear God Almighty, have noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens.
2. Pay attention to the diversity of student characteristics, culture, and regional conditions. The development of this learning is carried out without distinguishing between religion, ethnicity, culture, customs, as well as socioeconomic and gender status. The curriculum includes, in an integrated manner, the compulsory content, local content, and self-development, and is arranged in meaningful and appropriate connections and continuities between the substances.
3. Balance between national interests and regional interests. The curriculum is developed by paying attention to national interests and five regional interests to build the life of society, nation, and state. National interests and regional interests must complement and empower each other in line with the motto of

Bhineka Tunggal Ika within the framework of the Unitary State of the Republic of Indonesia.

4. Focus on revitalizing the curriculum to create competitive graduates. Learning development is carried out, including improving institutional aspects, curriculum, and learning system processes, recruiting prospective students, strengthening human resource capacity, strengthening infrastructure, and quality assurance system.
5. Relying on the implementation of learning innovations. The development of education and learning systems based on excellence and local wisdom is implemented in the framework of real-world environment-based learning, the development of virtual learning environments, the improvement of learning resources, the increase in the capacity and productivity of scientific-publications, the increase in the capacity of human resources in the implementation of the educational paradigm, the capacity of education quality assurance, and the increase in the capacity and infrastructure of information technology.
6. Ability to adapt to the development of the times. Based on the history of education in Indonesia and the characteristics of learning, students today need multi-modal learning facilities, fast services, and learning anytime, anywhere. Learning innovations that accommodate students' needs can be carried out with an emphasis on excellence and local wisdom, through student-centered learning (SCL). Based on excellence and local wisdom, it aims to achieve the ability to learn to learn.

Philosophical Foundations

The Basic Scientific Pattern (PIP) of Mulawarman University, "Wet Tropical Forests and Their Environment," is a characteristic of Mulawarman University that can be distinguished from other universities in Kalimantan, in Indonesia, or in the world. Based on this, the curriculum was developed with the following philosophy:

- (1) Education is a process of humanizing students in their dignity and dignity. Education is aimed at developing spiritual intelligence, heart intelligence, intellectual intelligence, and academic brilliance through disciplined education, both in instructional *effect* and *nurturant effect*.
- (2) Education is a cultural transformation; it is rooted in the nation's culture to build the life of the nation today and in the future. Students are the heirs of the nation's creative culture;
- (3) Education is to build a better life for the present and future than the past with various intellectual abilities, communication skills, social attitudes, care, and participation to build a better life for the community and nation.

Sociological Basis

The foundation for curriculum development as an educational tool consists of objectives, materials, learning activities, and a positive learning environment for the acquisition of learner experiences that are relevant to the personal and social development of learners. The curriculum must be able to pass on culture from one generation to the next amid the influence of globalization, which continues to erode local culture. The competencies that must be possessed by prospective professionals in the 21st century include the mastery of at least three competencies, namely, cultural minimization, namely, the ability to control oneself and adjust to standards, in working conditions at the international level, cultural adaptation, and cultural integration.

Psychological Foundations

The curriculum is able to continuously encourage students' curiosity and can motivate lifelong learning; a curriculum that can facilitate students to learn so that they are able to realize their roles and functions in their environment; curriculum that can cause students to think critically, and think at a level and do higher order thinking; curriculum that can optimize the development of students' potential to become the desired human being (Zais, 1976, p. 200); a curriculum that can facilitate students to learn to become complete human beings, namely free, responsible, confident, moral or noble human beings, able to collaborate, tolerant, and become educated human beings full of determination to contribute to the achievement of ideals in the preamble to the 1945 Constitution.

Juridical Basis

1. Law of the Republic of Indonesia No. 14 of 2005 concerning Teachers and Lecturers (Statute Book of the Republic of Indonesia No. 157 of 2005, Supplement to Statute Book of the Republic of Indonesia No. 4586);
2. Law of the Republic of Indonesia No. 12 of 2012 concerning Higher Education (Statute Book of the Republic of Indonesia No. 158 of 2012, Supplement to Statute Book of the Republic of Indonesia No. 5336);
3. Presidential Regulation of the Republic of Indonesia Number 8 of 2012, concerning the Indonesian National Qualifications Framework (KKNI);
4. Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 73 of 2013, concerning the Implementation of KKNI in the Higher Education Sector;
5. Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 3 of 2020, concerning National Standards of Higher Education;
6. Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 5 of 2020, concerning Accreditation of Study Programs and Universities;
7. Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 2020, concerning the Establishment, Amendment, Dissolution of State Universities, and the Establishment, Amendment, and Revocation of Private Universities Licenses;
8. Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 81 of 2014, concerning Diplomas, Competency Certificates, and Professional Certificates of Higher Education;
9. Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 53 of 2023, Regarding Quality Assurance of Higher Education
10. Guidelines for the Preparation of the Higher Education Curriculum, Director General of Higher Education 2020, and Guidelines for 2024;
11. Guidebook for the Preparation of KPT in the Industrial Era 4.0 to Support Independent Learning of Independent Campuses, Directorate General of Belmawa, Higher Education-Ministry of Education and Culture, 2020;
12. Regulation of the Rector of Mulawarman University No. 5 of 2023 concerning the Implementation of Education and Teaching, Research, and Community Service at Mulawarman University.

13. Guidelines for Preparing the Mulawarman University Curriculum with an Outcome-Based Education Approach 2024.
14. Educational Standards for Undergraduate Level in Food Science and Technology Revised Edition 2022

D. Vision, Mission, Purpose

Vision:

Center for Resource Management and Scientific Development in the Field of Agricultural Product Technology with International Standards, Superior and Characteristic of the Humid Tropics

A center for the development of science and resource management in the field of Agricultural Product Technology that is superior, with international standards, and characteristics of humid tropics

Mission;

1. Managing Institutional, Human, and Facility Resources to Improve the Quality of International Students, Graduates, and Lecturers
2. Organizing Research and Community Service to Develop Agricultural Product Science and Technology that Is Beneficial to the Community and Supports Curriculum Development
3. Increasing Output Productivity and Impact in the field of Agricultural Product Technology that Has a Competitive Advantage, Referring to the Thematic Peculiarities of the Humid Tropics and establishing partnerships

Goals and Objectives

Goal 1. Managing and Improving the Quality of Lecturers and Staff and Expanding Partnerships.

- Objective 1.1: increase the number and qualification of Practitioner Lecturers
- Objective 1.2: Increase the number and qualifications of teaching industry practitioners in the teaching profession
- Objective 1.3: to balance the burden of student guidance between lecturers and, to the extent possible, adapt it to the applicable rules.
- Objective 1.4: Balance the DTPS teaching load and adjust to the applicable rules
- Objective 1.5: evenly balance the additional workload of DTPS
- Objective 1.6: record and support the achievement of DTPS recognition/awards
- Goal 1.7: Strive to provide regular laboratory training every year
- Goal 1.8: Strive to refresh the skills of staff regularly every year

Goal 2. Managing and Improving the Quality of Students

- Objective 2.1: To record and support DTPS research programs involving students
- Objective 2.2: to record and support the PkM DTPS program involving students
- Objective 2.3: Foster student association participation in the student competitive grant program
- Objective 2.4: support students in participating in national and international competitions
- Objective 2.5: Facilitate students' participation in the MBKM program

Goal 3. Managing Facility and Financial Resources

Objective 3.1: Manage and Record Financial Allocation of PNB/State University Operational Assistance (BOPTN) for PS Operations

Objective 3.2: Record PNB/BOPTN Financial Allocation for Student Operations

Objective 3.3: Record PNB/BOPTN Financial Allocation for Research

Objective 3.4: Record PNB/BOPTN Financial Allocation for PkM

Objective 3.5: Record PNB/BOPTN Financial Allocation for Investment in Human Resources, Facilities, and Infrastructure

Objective 3.6: Plan for Additions and Manage Laboratory Facilities

Objective 3.7: Plan and Start a Laboratory Accreditation Program

Goal 4. Organizing and Developing Teaching, Research, and PKM

Objective 4.1: Realize the THP Professional Compendium Book

Objective 4.2: Encourage and Record DTPS Scientific Publications that Become Part of Teaching Materials

Objective 4.3: Implement the Revision of the Constitutional Court's RPS and Learning Implementation Plan (RPP) Using PBL (Project-Based Learning)

Objective 4.4: Encourage and Record DTPS Research

Objective 4.5: Encourage and Record DTPS PKM

Goal 5. Increasing Outdoor Productivity in the field of THP refers to the Thematic Peculiarities of the Humid Tropics

Objective 5.1: Encourage and Record DTPS Scientific Publications and Involve Students

Objective 5.2: Encourage and Record KI DTPS Registration and Involve Students

Objective 5.3: Keeping Parameter Quality Average GPA Students ≥ 3.0

Objective 5.4: Maintain the quality parameters of PS accreditation at least very good.

Goal 6. Increasing Impacts That Have a Competitive Advantage Referring to the Thematic Peculiarities of the Humid Tropics

Objective 6.1: Encourage and Record DTPS Scientific Publication Citations

Objective 6.2: Encourage and Record the Utilization of DTPS Products in the Community

Objective 6.3: Encourage and Record the Percentage of Graduates Working in < 6 months

Objective 6.4: Encourage and Record Graduates to get a first salary equivalent to UMR

Goal 6.5: Encourage and Record Partner Cooperation

E. Graduate Profile Summary

The Mulawarman University THP Study Program establishes a graduate profile that reflects the competencies students must possess upon completing their studies. The profile of these graduates is prepared based on the analysis of stakeholder needs, relevance to the development of science and technology, and in line with the university's

vision and mission, based on local potential and sustainable development, with a focus on the tropical rainforest ecosystem and its environment. The following are the profiles of graduates who have been determined:

Table 2. Graduate profile input results

Ye s	PL Code	Graduate Profile (PL)	Competency Description
1	PL-1	Practitioner	Playing a role in the field of agricultural product technology by mastering technical and practical skills to solve problems in the industrial world or consulting institutions.
2	PL-2	Entrepreneur	Acting as a creative and innovative entrepreneur who can identify opportunities and manage businesses in fields relevant to their expertise in a sustainable and highly competitive manner.
3	PL-3	Academics and Researchers	Acting as an educator, learning facilitator, or research assistant in educational and research institutions, and having adequate provisions to continue their studies to a higher level.
4	PL-4	Bureaucrats	Plays a role in carrying out administrative tasks, planning, implementation, and evaluation of programs in the government sector or public institutions.

F. Learning Outcomes

Table 3. Graduate learning outcomes

Graduate Learning Outcomes	
Attitude	
CPL-1	Able to show high integrity, uphold ethics and professionalism, and show entrepreneurial character and leadership, competent in establishing cross-disciplinary synergy, and have good <i>soft skills</i> .
Knowledge	
CPL-2	Able to explain the basics of agricultural product technology (food chemistry and food analysis, food microbiology, food safety, food engineering and processing, food biochemistry, nutrition and health, and applied science about food and agricultural products).
General Skills	
CPL-3	Able to analyze problems in the field of agricultural product technology logically, critically, and systematically to provide solutions, as well as communicate them orally and in writing well
Special Skills	
CPL-4	Able to develop the concepts and principles of agricultural product technology in MSMEs and industries to produce food products that are safe, of high quality, and in accordance with standards.

CPL Relationship Matrix with Graduate Profile

Table 4. CPL relationship matrix with Graduate Profile

No	CPL	Graduate Profile			
		PL-1	PL-2	PL-3	PL-4
1	CPL-1	v	v	v	v
2	CPL-2	v	v	v	v
3	CPL-3	v		v	v
4	CPL-4	v	v	v	

G. Formation of Study Materials

Table 5. PS THP curriculum study materials

No	Code BK	Study Materials (BK)	Description of the Study Material
1	BK-1	Chemistry and Analysis of Food Components of Agricultural Products	This field of study equips students with information related to the chemical structure, role and properties of food components (water, carbohydrates, proteins, oils/fats, micro components (vitamins, minerals, toxic components and bioactive components, and food additives); chemical changes that occur during the process of processing, storage, and use and their effects on the characteristics and shelf life of food products; methods of analyzing food components.
2	BK-2	Microbiology and Food Safety of Agricultural Products	This field of study is about the characteristics of beneficial microorganisms, pathogenic and decaying, internal and external factors that affect their growth, survival, and control, food safety principles, hazards of food origin of agricultural products, as well as how to control them, sanitation and hygiene practices for the control of pathogenic microbes in food production, as well as food safety systems (Good Food Production Practices and HACCP), qualitative and quantitative microbiological analysis methods, and fermentation processes in food preservation and processing.
3	BK-3	Engineering and Process of Food Processing of Agricultural Products	This field of study equips students with the principles of food engineering (transport process, fluid flow, heat transfer and mass transfer, thermodynamics, principles of mass and energy coherence, separation process, modeling and simulation), principles of food processing processes (food processing operation units and equipment), knowledge of raw materials and

No	Code BK	Study Materials (BK)	Description of the Study Material
			their influence on food processing operations, food factory design (process control and automation) and utilities (refrigeration, steam, water and waste handling, and electricity)
4	BK-4	Food Biochemistry of Agricultural Products, Nutrition and Health	This field of study is about the principles of biochemistry (basic concepts of the relationship between biochemical structure and function, reactivity, and thermodynamics), the basic principles of the nutritional value of food and the metabolism of essential nutrients (the components of nutrients and the bioactive components required by humans, the digestive system, absorption, metabolism, interaction and function of nutrients, nutrient and energy needs, and nutrient deficiencies), the basic concepts of nutrition and the relationship between food consumption and nutritional status, The role of nutrients and bioactive compounds, and the effects of food consumption on health, the functionality of food components and commonly used laboratory techniques in applied biochemistry and biological tests, and the effect of processing and storage on nutrient changes.
5	BK-5	Food Science Applied Agricultural Products	This field of study equips students with data collection, analysis, interpretation, and presentation. Physiological and psychological bases of sensory tests, sensory test methods for assessing food sensory properties, and experimental design and statistical methods for sensory tests. The principles of food quality assurance and control, food quality assurance system, halal assurance system, and their application in the food industry. Regulations related to the production and marketing process of food products

No	Code BK	Study Materials (BK)	Description of the Study Material
6	BK-6	Ethics and Professionalism	This field of study focuses on the skills required to work in a team, interact with individuals from diverse backgrounds, lead groups, manage time, work under stressful conditions, and apply professional ethics in the food sector. Communication techniques to welcome technical and non-technical ideas in scientific forums in writing, verbally, and visually. Scientific reasoning and problem-solving related to technical aspects to train analytical and critical skills and decision-making skills.

Table 6. Synchronization of study materials with Graduate Learning Outcomes

No	Study Materials	CPL-1	CPL-2	CPL-3	CPL-4
1	Chemistry and Analysis of Food Components of Agricultural Products		v	v	
2	Microbiology and Food Safety of Agricultural Products		v	v	
3	Engineering and Process of Food Processing of Agricultural Products		v	v	v
4	Food Biochemistry of Agricultural Products, Nutrition and Health		v		
5	Food Science Applied Agricultural Products	v	v	v	v
6	Ethics and Professionalism	v		v	

Table 7. The relationship between the study material and the compulsory courses offered

No	Code BK	Study Materials (BK)	Course Name	Weight	Sks (weight/144*100)
1	BK-1	Chemistry and Analysis of Food Components of Agricultural Products Chemical structure, role and properties of food components (water, carbohydrates, proteins,	Agricultural Chemicals I	4	3
			Agricultural Chemistry II	4	3
			Chemical Analysis of Agricultural Products	4	3

No	Code BK	Study Materials (BK)	Course Name	Weight	Sks (weight/144*100)
		oils/fats, micro components (vitamins, minerals, toxic components and bioactive components, and food additives); chemical changes that occur during the process of processing, storage, and use and their effect on the characteristics and shelf life of food products; methods of analysis of food components	Agricultural Product Chemical Analysis Practicum	3	2
2	BK-2	Microbiology and Food Safety of Agricultural Products Beneficial microorganisms, pathogenic and decaying, internal and external factors that affect their growth, survival, and control, food safety principles, hazards of food origin of agricultural products, as well as how to control them, sanitation and hygiene practices for the control of pathogenic microbes in food production, as well as food safety systems (Good Food Production Practices and HACCP), qualitative and quantitative microbiological analysis methods, and fermentation processes in food preservation and processing.	Cell Biology	4	3
			Microbiology of Agricultural Products	3	2
			Microbiology of Agricultural Product Processing	3	2
			Sanitation and Safety of the Food Processing Industry	3	2
			Microbiological Analysis of Agricultural Products	4	3
3	BK-3	Engineering and Process of Food Processing of Agricultural Products Principles of food engineering (transport process, fluid flow, heat transfer and mass transfer, thermodynamics, principle of mass and energy coherence, separation process, modeling	Physics of Agricultural Products	4	3
			Processing Tools and Machinery	4	3
			Engineering Economics	3	2
			Food Knowledge	3	2
			Operations Unit	4	3

No	Code BK	Study Materials (BK)	Course Name	Weight	Sks (weight/144*100)
		and simulation), principles of food processing process (food processing operation units and equipment), knowledge of raw materials and their influence on food processing operations, design of food plants (process control and automation) and utilities (refrigeration, steam, water and waste handling, and electricity)	Plant Layout and Design	3	2
			Physical Properties of Agricultural Products	4	3
			Post-Harvest Physiology and Technology	3	2
			Food Processing Technology and Agricultural Products	6	4
			Sensory Tests	4	3
			Agricultural Product Preservation, Packaging, and Storage Technology	4	3
			Operations Research	4	3
4	BK-4	Food Biochemistry of Agricultural Products, Nutrition and Health Biochemical principles (basic concepts of biochemical structure and function relationships, reactivity, and thermodynamics), basic principles of food nutritional value & metabolism of essential nutrients (nutrient components and bioactive components needed by humans, digestive system, absorption, metabolism, interaction and function of nutrients, nutrient and energy needs, and nutrient deficiencies), basic concepts of nutrition and the relationship between food consumption and nutritional status, The role of nutrients and bioactive compounds, and the effects of food consumption on health, the	Biochemistry of Agricultural Products	4	3
			Food Nutrition	3	2

No	Code BK	Study Materials (BK)	Course Name	Weight	Sks (weight/144*100)
		functionality of food components and commonly used laboratory techniques in applied biochemistry and biological tests, and the effect of processing and storage on nutrient changes.			
5	BK-5	Food Science and Applied Agricultural Products Data collection, analysis, interpretation, and presentation. Physiological and psychological basis in sensory tests, sensory test methods to assess the sensory properties of food, and experimental design and statistical methods in sensory tests. The principles of food quality assurance and control, food quality assurance system, halal assurance system, and their application in the food industry. Regulations related to the production and marketing process of food products	Math	3	2
			Introduction to Tropical Agricultural Science	3	2
			Research Methodology	4	3
			Agricultural Statistics	4	3
			Agricultural Products Industry Quality Management System	4	3
			Experimental Design	4	3
			Entrepreneurship	3	2
			Food Regulation	3	2
			Product Innovation and Marketing	4	3
			Operations Research	4	3
6	BK-6	Ethics and Professionalism Skills required to work in a team, interact with individuals from different backgrounds, and lead in groups, abilities in time management and work under stressful conditions, and professional ethics in the food sector. Communication techniques to welcome technical and non-technical ideas in scientific forums in writing, verbally, and visually. Scientific reasoning and problem-solving related to technical	Religion	4	3
			São Paulo	3	2
			Indonesian Language	3	2
			Basic Social and Cultural Sciences	3	2
			Nationality	3	2
			Agricultural English	4	3
			Introduction to Artificial Intelligence	3	2
			Fieldwork Practice	3	2
			Thesis Assistance I	2	1

No	Code BK	Study Materials (BK)	Course Name	Weight	Sks (weight/144*100)
		aspects to train analytical and critical skills and decision-making skills.	Thesis Assistance II	2	1
			Real Work Lecture/ Thematic KKN/ Building Villages/ Humanitarian Tasks	4	3
			Seminar	3	2
			Thesis	9	6

Table 8. Description of the compulsory courses offered

Years	Code BK	Study Materials (BK)	Course Name	Course Description
1	BK-1	Food Chemistry and Component Analysis	Agricultural Chemicals I	The scope includes the basic understanding of substances and their types, properties and changes of substances, the development of atomic theory, electron configuration, periodic regression systems, chemical bonds and nomenclature of chemical compounds, basic laws of chemistry and reaction equations, the concept of mold and stoichiometry, acid-base theory, pH calculation, chemical equilibrium, buffer solutions, redox reactions, core chemistry, organic chemistry and agricultural chemistry.
			Agricultural Chemistry II	This course discusses the principles of physical chemistry and the chemistry of agricultural components, which are the basis for understanding the nature, changes, and applications of food components. The scope includes the physical and chemical properties of water, carbohydrates, proteins, lipids, vitamins, minerals, as well as bioactive components, antinutrients, toxins, flavors, colors, and antioxidants. In addition, the concepts of gas laws, solutions, colligative properties, viscosity,

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				solvent extraction, thermodynamics, emulsions, polymers, crystallization, rheology, and colloids related to the food system are also studied.
			Chemical Analysis of Agricultural Products	This course discusses the definition of analysis, the grouping of foodstuffs, the purpose of analysis, as well as the procedures and requirements for the analysis of agricultural products. The material includes general methods of storing samples for the purposes of chemical analysis and techniques for determining water content, ash, protein, fat, oil, carbohydrates, vitamins, minerals, antinutrient compounds, and food additives. The material also includes instrumentation-based analysis.
			Agricultural Product Chemical Analysis Practicum	Includes the implementation of concepts related to the Chemical Analysis of Agricultural Products course.
2	BK-2	Microbiology and Food Safety	Cell Biology	This course discusses the structure, function, and dynamics of cells as the basic unit of life, as well as their relationship with biological processes in organisms. The scope includes basic cell theory, prokaryotic and eukaryotic cell differentiation, organelle structure and function, cell membrane and transport, cell cycle, mitosis and meiosis, and mechanisms of cell growth and differentiation. In addition, the basics of cell biochemistry, energy metabolism (respiration and photosynthesis), cell genetics (DNA, RNA, gene expression, and regulation) are also

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				studied, as well as interactions between cells in tissues.
			Microbiology of Agricultural Products	This course discusses the principles of microbiology, which include the history of microbiological development, classification of microorganisms, bacteria, fungi, protozoa, algae, viruses, metabolism of microorganisms, nutrition and cultivation of microorganisms, growth of microorganisms, control of microorganisms, genetics of microorganisms, and the role of microorganisms in the processing of agricultural products.
			Microbiology of Agricultural Product Processing	This course discusses the principles of food microbiology, factors that affect microbial growth during the food processing process (the effect of temperature, water activity, preservatives, and radiation on microbial activity), the effect of processing on microorganisms, the ecology of microorganisms in various agricultural products, food-borne diseases, food fermentation, probiotics, and prebiotics.
			Sanitation and Safety of the Food Processing Industry	This course presents hygiene and sanitation regulations in food processing both nationally and internationally, sources of contamination and its control, basic sanitation techniques, hygienic industrial design, hygiene and sanitation of processing facilities, cleaning and disinfection, cleaning in place, personal hygiene, and various sanitation indicator tests, management of liquid and solid waste, hazardous waste destruction process, recycling technology,

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				consumer safety labeling and information, SSOP, CPPB, HACCP.
			Microbiological Analysis of Agricultural Products	General techniques and standard procedures of microbiological analysis, manufacturing and sterilization of media, aseptic techniques, types of media, factors affecting microbial growth, isolation and culture transfer techniques, identification and characterization of simple microbes, microscopic observation (morphology of yeast cells, bacteria, fungi), microbial calculation (cup count, MPN). Analysis of air, space, and human/worker quality. Colliform test, food pathogen microbial test, and antimicrobial analysis.
3	BK-3	Food Engineering and Process	Physics of Agricultural Products	<p>Mechanics of unit systems, scalar/vector quantities, Newton's law, and the principle of equilibrium. Liquid properties of static liquids, flowing liquids, and molecular phenomena of surface tension. Thermodynamics of heat and temperature, energy transformation, and heat transformation. Modern physics, quantum theory, nuclear radiation.</p> <p>This course discusses the principles of physics applied to agricultural products, especially the physical, mechanical, thermal, and rheological properties that affect handling, processing, and storage. Materials include the basic properties of agricultural materials, the mechanics of agricultural materials, fluid flow properties, heat and mass transfer,</p>

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				and rheological phenomena of foodstuffs.
			Processing Tools and Machinery	This course discusses the types and working principles of equipment and machinery used in food processing and the production of agricultural products. Materials include <i>material handling equipment</i> such as conveyors, forklifts, air combustion systems, and pumps; power plants such as <i>internal combustion</i> engines, <i>steam</i> boilers, <i>power transmissions</i> , burners, and electric motors; size reduction tools such as <i>crushers</i> , <i>millers</i> , <i>blenders</i> , and <i>slicers</i> ; tools mixer (<i>dry mixer</i> , <i>wet mixer</i>); separators such as <i>centrifuges</i> , filters, and <i>sievers</i> ; refrigeration devices such as <i>coolers</i> and <i>freezers</i> ; drying tools such as <i>electric driers</i> , <i>sun driers</i> , and <i>burner driers</i> ; fermenters; packaging tools such as <i>packers</i> and <i>wrappers</i> ; sterilization devices such as <i>autoclaves</i> and <i>irradiators</i> ; as well as room conditioning devices such as fans and <i>humidifiers</i> . In addition, the application of various equipment and machines in the agricultural product handling and processing industry was discussed.
			Engineering Economics	This course discusses the scope of engineering economics, including the concepts of costs, profits, and cash flows. The material includes the relationship between the value of

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				<p>money and the time and interest rate of capital, and cost analysis using the Net Present Value (NPV) method and the <i>Uniform Annual Cash Flow Analysis</i> (UACFA). In addition, alternative investment analysis with <i>the Rate of Return</i> (ROR) method, such as <i>Payback Period</i>, <i>Average Accounting Rate of Return</i> (AAR), <i>Internal Rate of Return</i> (IRR), <i>Modified Internal Rate of Return</i> (MIRR), <i>Profitability Index</i> (PI), <i>Benefit-Cost Ratio</i> (B/C), <i>Break-Even analysis</i>, and calculation methods were discussed for depreciation.</p>
			Food Knowledge	<p>This course discusses the chemical and physical characteristics of various agricultural products, including the properties that affect their quality and durability. The material includes various chemical, biochemical, and physical reactions that can occur during handling, storage, and processing, as well as reaction mechanisms that cause degradation or damage to food.</p> <p>This course discusses various types of food, both plant and animal, in terms of composition, physicochemical characteristics, nutritional value, and changes that occur during handling, processing, and storage. Materials include food crops, horticulture, spices, meat, fish, eggs, milk, and additional food ingredients.</p>

Years	Code BK	Study Materials (BK)	Course Name	Course Description
			Operations Unit	This course introduces the engineering of food processing to increase added value and product diversification. The material covers the scope of mastery of an operating process through the philosophical approach of <i>black-box diagrams</i> , the <i>basic laws of mass and energy balances</i> , <i>ideal gas laws</i> , energy transfer, kinetic processes, and equilibrium, as well as the principles of fluid mechanics and fluid material transportation.
			Plant Layout and Design	This course discusses the scope of factory design, especially the planning of small-scale food processing units. The material includes raw material planning, production processes, equipment layout, and process stages. In addition, production capacity planning, material flow and handling, and the relationship between activities in the production system were discussed.
			Physical Properties of Agricultural Products	This course discusses the concepts, principles, and methods of measuring the physical properties of various agricultural products, including mechanical, thermal, optical, hydraulic properties, as well as properties related to shape, size, density, texture, and moisture content. The material emphasizes the relationships among physical properties, post-harvest handling, processing, packaging, transportation, and product quality. A practicum complements learning to measure and analyze physical parameters using laboratory instruments, as well as relate the

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				characteristics of materials to the application of food processing technology, process optimization, and product development.
			Post-Harvest Physiology and Technology	The scope of this course includes the definition of post-harvest physiology and technology, metabolism in agricultural products, respiration patterns (climacteric and non-climacteric), senescence, ethylene, physical and chemical changes during ripening, harvest index, post-harvest pathology, and its handling. The effects of temperature, RH, and gas composition on the physiological, biochemical, quality, and freshness of agricultural products.
			Food Processing Technology and Agricultural Products	This course discusses the principles and application of the process of handling and processing agricultural products from post-harvest to semi-finished products and final products. The scope includes threshing, cleaning, drying, stripping, size reduction, and material handling, as well as the basics of food rheology. In addition, various processing methods, such as heating, cooling, freezing, drying, extrusion, crystallization, fermentation, and non-thermal technologies, are discussed, along with their effects on product quality, nutrition, and sensory properties.
			Sensory Tests	This course introduces the sensory properties of foodstuffs and their testing methods, including sensory function and sensory response measurement. The material includes sensory test requirements, panelist selection, management of sensory

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				test laboratories, and test preparation and execution. The types of tests discussed include differentiation tests, affectation tests (hedonic, hedonic quality, scale), description tests, and consumer tests. In addition, standard procedures, examples of the application of sensory tests in the food industry, and the application of statistical analysis in the processing of sensory test data were discussed.
			Agricultural Product Preservation, Packaging, and Storage Technology	This course discusses various methods of food preservation, including drying, smoking, canning, the addition of preservative chemicals, heating, cooling, and fermentation. The material also includes an introduction to the functions and roles of food packaging, ranging from natural and traditional packaging to modern packaging technology. In addition, the types and characteristics of various packaging materials are discussed, including glass, metal, wood, paper, cardboard, plastic, anti-vibration materials, traditional packaging materials, and edible coatings. The topic was complemented by a discussion of food label requirements and smart packaging innovation.
			Operations Research	This course discusses solving the problem of optimizing the use of limited resources with linear programming, especially using the simplex method. Material covers the application of linear programming to a variety of specialized forms, including transportation problems, assignments (single or multiple time and divisions), and transshipment.

Years	Code BK	Study Materials (BK)	Course Name	Course Description
4	BK-4	Food Biochemistry, Nutrition, and Health	Biochemistry of Agricultural Products	This course discusses the meaning of biochemistry, the structure and function of biomolecules, the process of photosynthesis, and the biosynthesis of simple molecules. The metabolism of water, carbohydrates, proteins, and fats, as well as the mechanisms of gene expression.
			Food Nutrition	This course discusses the introduction of nutrition science, covering the types of nutrients and their relationship to food, agriculture, health, and human growth and development. The material includes the processes of digestion, absorption, and metabolism of nutrients; functions, needs, and impacts of vitamin and mineral deficiencies on the body; nutritional problems and interactions between nutrients; assessment of nutritional status; as well as a review of various nutrition improvement programs.
5	BK-5	Applied Food Science	Math	This course discusses basic concepts of mathematics and calculus, including sets, relationships, and functions; rows and matrix algebra; vectors; logic; limits; derivatives and their applications; integrals and their applications; and integral calculus.
			Introduction to Tropical Agricultural Science	This course discusses the definition and history of agricultural development, with a focus on wet tropical agricultural systems. The material covers the role of wet tropical agricultural systems in development, including efforts to increase income and community welfare, post-harvest handling of wet tropical agricultural products, as well

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				as industrial development and agricultural industrialization.
			Research Methodology	This course studies the stages of scientific research, from preparing research proposals and implementing the research to writing the research report results. The material includes problem determination, literature review, citation techniques, the use of library management software (Mendeley), identification of research variables, observation and data collection methods, interpretation of analysis results, and procedures for writing scientific papers, such as theses and scientific publications. The discussion also included the procedure for implementing the seminar and the presentation of research results.
			Agricultural Statistics	This course discusses the basic concepts and benefits of statistics, including statistical notations, the size of concentration and diversity of data, and its usefulness (including Chebyshev's postulate and Z-value), as well as the presentation of data through frequency distributions and graphs. The material includes example spaces, events, the probability of an event, random variables (distribution, mean, and variance), discrete probability distributions (binomial, multinomial, hypergeometric, geometric, Poisson), continuous (normal) probability distributions and their applications, and sample draws (t distribution). In addition, parameter estimation and testing (middle value, difference between two middle values, variety, ratio of two varieties), introduction of

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				regression and correlation analysis, variety analysis, and non-parametric statistics were discussed.
			Agricultural Products Industry Quality Management System	This course discusses the concepts, principles, and applications of management and quality control in the field of food and agricultural products. The material covers the scope of quality, national and international quality standards, physical, chemical, and sensory quality control methods, and factors that cause food damage and degradation. In addition, modern quality management systems such as Total Quality Management (TQM), Good Manufacturing Practices (GMP), Sanitation Standard Operating Procedures (SSOP), Hazard Analysis Critical Control Point (HACCP), ISO, SNI, and Halal Assurance System (HAS 23000) were also studied. Students are also equipped with an understanding of quality documentation, food regulations, certification, and quality audits.
			Experimental Design	This course discusses the definition and scope of experiments, the basic elements of experiments (experimental units, treatments, and experimental errors), and basic assumptions, including the role of repeats, factors that affect the number of repeats, and control techniques. The material includes research science, research procedures, determination of the type of experiment (single and factorial), and classification of experimental designs such as Complete Random Design (RAL), Group Random

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				Design (RAK), Latin Longitudinal Design (RBSL), and Divided Tile Design (RPT), along with their analysis using <i>analysis of variance</i> . In addition, the basic assumptions of diversity analysis (normally distributed data and homogeneity of diversity), data transformation methods (e.g., the Successive Interval Method), nonparametric data analysis for data that do not meet the assumptions of diversity analysis, and multiple-comparison techniques are discussed.
			Entrepreneurship	This course provides entrepreneurial insights with a focus on growing the spirit of <i>technopreneurship</i> in the fields of agricultural and food products. The material covers entrepreneurial strategies and the challenges faced, industry establishment and management, product standardization and certification, and the fundamentals of product development and design.
			Food Regulation	This course discusses the legal system in Indonesia and internationally in the food sector, the process of drafting laws and regulations under it, and laws and regulations related to food.
			Product Innovation and Marketing	This course discusses principles and strategies in the development of innovative food products based on local agricultural products, as well as marketing approaches that are adaptive to market dynamics and consumer behavior. Students will learn the process of identifying market needs, formulating product ideas, designing and testing products, as well as branding, distribution, and

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				promotion strategies. Through case studies and field practice, this course aims to equip students with the ability to design value-added products and develop competitive and sustainable marketing plans.
6	BK-6	Ethics and Professionalism	Religion	This course discusses the development of students who believe and are devoted to Allah SWT, have noble character, have a work ethic, uphold human and life values, and participate in developing knowledge and technology for the benefit of the nation and state.
			São Paulo	This course understands Pancasila as the basis for the value of knowledge development formed in an attitude of inclusiveness, tolerance and mutual cooperation in religious and cultural diversity.
			Indonesian Language	This course studies grammar, syntax, spelling, language logic, sentence and paragraph structure, systematics of writing scientific papers, use of standard terms, absorption from foreign and local languages, and methods of making summaries.
			Basic Social and Cultural Sciences	This course discusses the population, society from culture (Population growth from migration; cultural development, institutions of (Concept of identity, function form of the family system): Youth from socialization, (Internalization, learning, specialization; internalization, learning, specialization; The role of universities, families and society as educational institutions); Citizens and the State (State and government law; rights and obligations of

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				citizens; Legal and Political Awareness); Coating and uniformity degrees; Society (Concept of urban-rural-industrial society; influence between communities of industrial cities); Social conflict and national integration and unity): Science (concept of science; Appropriate and modern technology; the concept of poverty; the influence of technology on society).
			Nationality	This course develops knowledge and understanding as well as awareness of National Security Defense (HANKAMNAS), the student environment in the framework of National Resilience (TANNAS), in addition to helping to foster from increasing national discipline awareness. For this reason, students are given an understanding of the introduction to entrepreneurship, Archipelago Insights, National Resilience from the Politics of National Security Defense Strategy as a foundation in understanding the Universal People's Security Defense system.
			Agricultural English	This course provides the use of English adapted to the intermediate and pre-advanced levels. The use is emphasized on the ability to understand scientific readings and the addition of vocabulary and expressions in English as many as 4000-5000 words. The sentence structure (grammar) is given according to the scientific reading.
			Introduction to Artificial Intelligence	This course introduces the basic concept of artificial intelligence (AI) and its application in the field of agricultural product technology.

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				Materials include intelligent logic recognition, simple machine learning, and data processing. Examples of applications are discussed in sorting and grading agricultural products, predicting quality and shelf life, and decision support systems in the food industry. Through this course, students are expected to understand the basics of AI and be able to see opportunities to use it to support the improvement of the quality and efficiency of agricultural product processing.
			Fieldwork Practice	This course is a work internship in a government or private institution or agency related to the field of agricultural product technology or students do their own practice with the help of a supervisor for a certain period of time
			Thesis Assistance I	This course is focused on the initial stage of the guidance process for the preparation of thesis research proposals. Students will receive direction and improvement from the thesis supervisor related to problem formulation, literature review, preparation of research methodology, and preparation of discussion and conclusion chapters. This course is to ensure that the thesis report is composed logically, comprehensively and meets the set scientific writing rules.
			Thesis Assistance II	This course is a continuation of the thesis guidance process, which focuses on the implementation stage and writing the final report. Students will be guided in processing and analyzing data, interpreting research results, and preparing discussion and

Years	Code BK	Study Materials (BK)	Course Name	Course Description
				conclusion chapters. This course aims to ensure that thesis reports are compiled logically, comprehensively and meet the set scientific writing rules.
			Real Work Lecture/ Thematic KKN/ Building Villages/ Humanitarian Tasks	This course is a community service program designed to apply the knowledge and skills that students have acquired in college. Through this activity, students actively participate in solving problems in the community and contribute to sustainable development in designated locations. This course is a bridge between theory and practice and is a tangible manifestation of the Tri Dharma of Higher Education.
			Seminar	This course includes the presentation of research proposals (Seminar I) and research results (Seminar II) which are carried out based on the thesis writing process.
			Thesis	This course is the culmination of academic activities that test students' ability to design, carry out and report an independent research. Students prepare research proposals under the supervision of supervisors. After the proposal is seminared and approved, students carry out research, collect and analyze data, and prepare a final report that will be seminared at the results seminar. The thesis report prepared is adjusted to the rules of scientific writing that apply at the Faculty of Agriculture, Mulawarman University and will be maintained in a comprehensive session in front of the examiner team.

H. Course Formation (MK)

Table 9. Synchronization of Courses with Graduate Learning Outcomes

Ye s	MK Code	Course Name	CPL			
			1	2	3	4
Semester 1						
		Religion				
		São Paulo				
		Indonesian Language				
		Basic Social and Cultural Sciences				
		Cell Biology				
		Physics of Agricultural Products				
		Math				
		Agricultural Chemicals I				
Semester 2						
		Nationality				
		Introduction to Tropical Agricultural Science				
		Agricultural English				
		Microbiology of Agricultural Products				
		Processing Tools and Machinery				
		Engineering Economics				
		Food Knowledge				
		Introduction to artificial intelligence				

Ye s	MK Code	Course Name	CPL			
			1	2	3	4
		Agricultural Chemistry II (Combined: Agricultural Chemistry and Physical Chemistry)				
Semester 3						
		Operations Unit				
		Biochemistry of Agricultural Products				
		Plant Layout and Design				
		Research Methodology				
		Physical Properties of Agricultural Products				
		Agricultural Statistics				
		Microbiology of Agricultural Product Processing				
		Agricultural Products Industry Quality Management System				
Semester 4						
		Food Nutrition				
		Experimental Design				
		Sanitation and Safety of the Food Processing Industry				
		Microbiological Analysis of Agricultural Products				
		Post-Harvest Physiology and Technology				
		Chemical Analysis of Agricultural Products				

Ye s	MK Code	Course Name	CPL			
			1	2	3	4
		Agricultural Product Chemical Analysis Practicum				
		Food Processing Technology and Agricultural Products				
Semester 5						
		Sensory Tests				
		Entrepreneurship				
		Agricultural Product Preservation, Packaging and Storage Technology				
		Fieldwork Practice				
		Operations Research				
		Food Regulation				
		Product Innovation and Marketing				
Semester 6						
		Thesis Assistance I				
Semesters 7 and 8						
		Thesis Assistance II				
		Real Work Lecture/ Thematic KKN/ Building Villages/ Humanitarian Tasks				
		Seminar				
		Thesis				



: Linkage to "Weak" CPL

: Relationship to "Medium" CPL

 : Linkage with "Strong" CPL

I. Matrix, Curriculum Map, and Time Traveled

Table 10. Matrix, Curriculum Map and Duration

SMT	Number of credits	Learning Programs in Study Programs									MBKM		
											In PT	Outside PT	Non-PT
1	2	3									4	5	6
VIII	12	MK704	MK705								-		
		1 credits	6 credits								-		
											-		
VII	12	MK701	MK702	MK703	MKP7								
		1 credits	3 credits	1 credits	14 credits								
VI	24	MK601	MKP6										
		1 credits	27 credits										
V	24	MK501	MK502	MK503	MK504	MK505	MK506	MK507	MKP5				
		3 credits	2 credits	3 credits	2 credits	3 credits	2 credits	3 credits	11 credits				
IV	21	MK401	MK402	MK403	MK404	MK405	MK406	MK407	MK408				
		2 credits	3 credits	2 credits	3 credits	2 credits	3 credits	2 credits	4 credits				
III	22	MK301	MK302	MK303	MK304	MK305	MK306	MK307	MK308				
		3 credits	3 credits	2 credits	3 credits	3 credits	3 credits	2 credits	3 credits				
II	20	MK201	MK202	MK203	MK204	MK205	MK206	MK207	MK208	MK209			
		2 credits	2 credits	3 credits	2 credits	2 credits	2 credits	2 credits	2 credits	3 credits			

I	20	MK101	MK102	MK103	MK104	MK105	MK106	MK107	MK108				
		3 credits	2 credits	2 credits	2 credits	3 credits	3 credits	2 credits	3 credits				

Description :

MK101-MK108 : Compulsory courses semester 1

MK201-MK209 : Compulsory courses for semester 2, etc...

MKP5 : Elective courses for semester 5

MKP6 : Elective courses for semester 6

MKP7 : Elective courses for semester 7

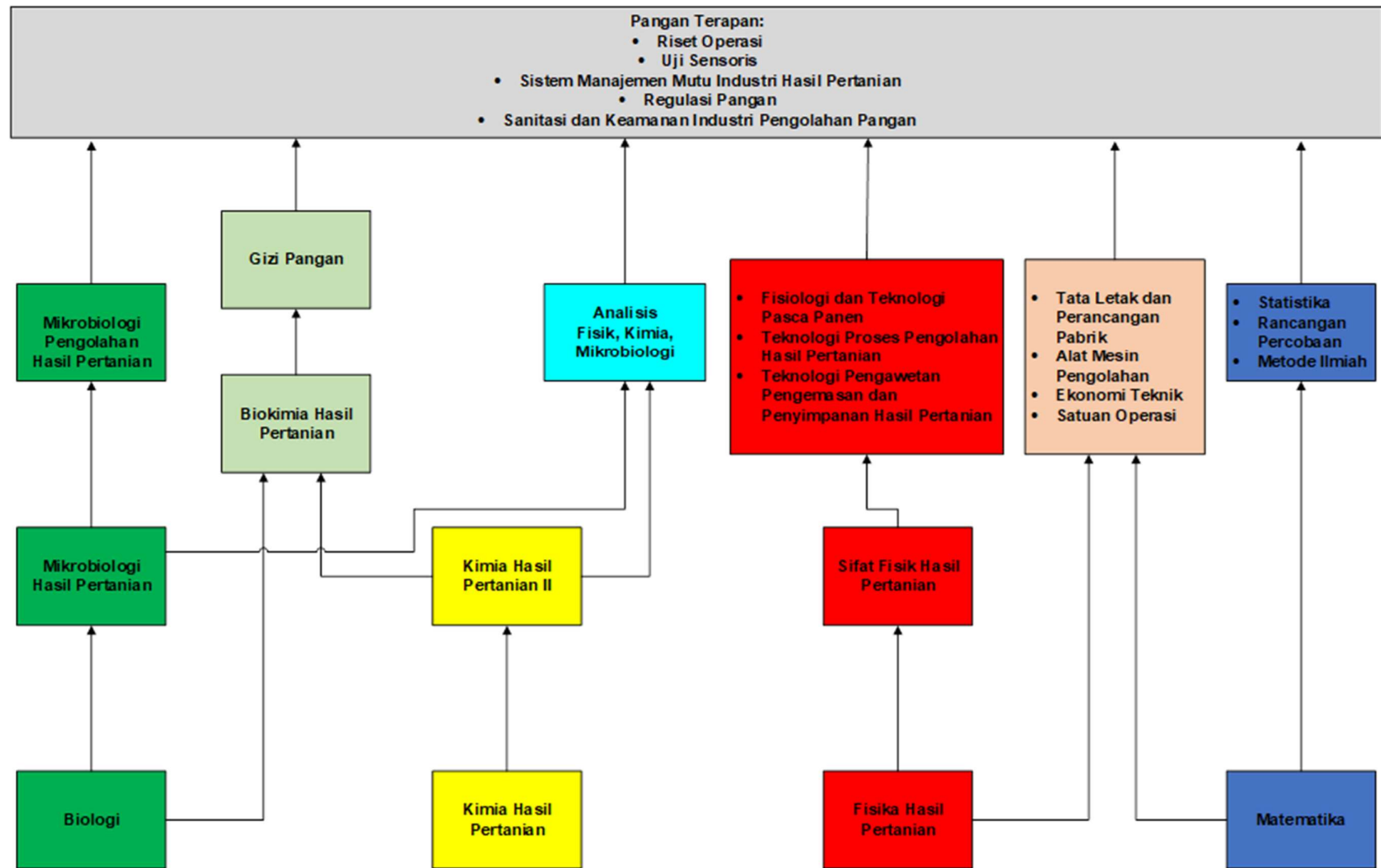


Figure 1. Map of PS THP courses

J. Semester Learning Plan (RPS)

The RPS PS THP document is compiled and attached separately from the curriculum document but becomes a unit of the entire curriculum document of the study program. The RPS document is attached.

K. Planning for the Implementation of Learning Rights Outside Study Programs

Permendikbudristek no. 53 of 2023 concerning Quality Assurance of Higher Education offers learning flexibility to accommodate learning by students outside the Study Program (Article 14). Flexibility in the educational process is offered in the form of: (a) a learning process that can be carried out face-to-face and remotely or a combination thereof; (b) flexibility for students to participate in education from various stages of the curriculum or studies in accordance with the curriculum of the study program; and (c) flexibility for students to complete education through recognition of past learning (RPL). Flexibility can also be seen from the definition of 1 credit, which is 45 hours of learning in 1 semester. The duration of 45 hours per semester can be in the form of guided learning, structured assignments and independent learning, either in the study program itself or outside the study program. The implementation of flexibility is to support the Independent Learning program which is followed by an Impact Campus. Therefore, curriculum development must support the flexibility of the Independent Campus or Impact Campus program.

In the 2026 curriculum, learning programs outside the study program are accommodated in the form of elective courses in a more flexible form, such as elective topics, industrial internships, or independent projects (for entrepreneurial activities),

Table 11. Forms of Learning Activities Outside Campus/College

Yes	Forms of Learning Activities	Implementation of Credit Weight Learning		Remarks
		Regular	MBKM	
1	Internship	2	≤20	MBKM Internship activities can be converted to several MKs that have CPL suitability and learning activity times that are in accordance with the weight of MK credits.
2	KKN/KKNTematik	3	≤20	MBKM KKNT activities, which are an extension of the Regular KKN, can be converted to several MKs that have CPL compliance and learning activity times that are in accordance with the weight of the MK credits
3	Entrepreneurship	2	≤20	MBKM Entrepreneurial activities can be converted to several MKs that have CPL suitability and learning activity times that are in accordance with the weight of the MK credits, including the Entrepreneurship MK if any.
4	Teaching Assistant in the Education Unit (AMSP)	4	≤20	AMSP MBKM activities can be converted to several MKs that have CPL suitability and learning activity times that are in accordance with the weight of MK credits.
5	Research/Research		≤20	It can be converted to several MKs that have CPL suitability and learning activity times that are in accordance with the weight of the MK credits.
6	Independent Studies/Projects		≤20	It can be converted to several MKs that have CPL suitability and learning activity times that are in accordance with the weight of the MK credits.
7	Humanities projects		≤20	It can be converted to several MKs that have CPL suitability and learning activity times that are appropriate to the weight of MK credits
8	Student Exchange		≤20	It can be converted to several MKs that have CPL suitability and learning activity times that are in accordance with the weight of the MK credits.
9	Defending the Nation		≤20	It can be converted to several MKs that have CPL suitability and learning activity times that are appropriate to the weight of MK credits

L. Quality Assurance Mechanism

Mulawarman University (Unmul) has established a quality assurance process mechanism at each level based on Rector Regulation Number 7 of 2019 concerning the Implementation of Quality Assurance in the Unmul Environment. This mechanism is implemented through the Institute for Education Development and Quality Assurance (LP3M) at the university level, the Faculty Quality Assurance Group (GJMF) at the faculty level, and the Quality Assurance Unit (UJM) at the study program level. The implementing elements of internal quality assurance at Unmul are determined through the Rector's Decree Number 2049/SK/2020 concerning Amendments to the Decree of the Rector of Mulawarman University Number 390/SK/2020 concerning the Management and Organizational Structure of LP3M Mulawarman University in 2020. Decision documents related to the management and structure of LP3M Unmul can be accessed through the official website of LP3M Mulawarman University (<https://lp3m.unmul.ac.id>). The implementation of the Internal Quality Assurance System (SPMI) at Mulawarman University is carried out in a sustainable and consistent manner, starting from the stage of determining SPMI standards, implementing SPMI standards, evaluating the implementation of SPMI standards, controlling the implementation of SPMI, to improving SPMI standards. All of these stages have become part of the academic culture at Mulawarman University.

The implementation of SPMI at Mulawarman University, including at the Faculty of Agriculture, is guided by the standard documents of SPMI Unmul. The implementation of SPMI Unmul refers to Government Regulation of the Republic of Indonesia Number 57 of 2021 concerning National Education Standards and Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 3 of 2020 concerning National Standards of Higher Education. The determination of standards is carried out through the provision of quality documents and the achievement of SPMI standards. The instruments developed by LP3M Unmul include policy documents, quality manuals, and SPMI standards which include 24 educational standards in accordance with the National Higher Education Standards (referring to Permenristekdikti Number 44 of 2015), which has been stipulated in October 2018. These documents are used at the faculty and study program levels to carry out the Determination, Implementation, Evaluation, Control, and Improvement (PPEPP) cycle.

The Faculty Quality Assurance Group (GJMF), in collaboration with LP3M, carries out monitoring and evaluation activities consistently and periodically to identify and take corrective actions necessary to prevent repeated failures in an activity. Internal audits are carried out periodically every year to monitor the implementation of the Quality Management System. The evaluation system for the implementation of SPMI quality standards is carried out through structured follow-up and continuous internal quality audit (AMI). The audit implementation process is carried out by certified auditors through LP3M Unmul using audit instruments as an auditor's work form. The results of the audit and verification are regulated in the Internal Audit Procedure Document, and the audit results are documented in the form of an Internal Quality Audit Report. The AMI report document can be accessed through the LP3M Unmul page and the related faculty program page.

Quality control is carried out through the holding of a Management Review Meeting (RTM) at the faculty level to discuss the results of the Learning Monitoring and Evaluation Report and the list of findings from the Internal Quality Audit (AMI) by the Quality Assurance Group (GJM). The faculty-level RTM at Mulawarman University is a form of follow-up to the results of AMI that have been implemented at the study program level in the current year. This meeting is an evaluative forum for quality management, especially in discussing findings that show non-conformity or inability to achieve the standards that have been set in SPMI Unmul. RTM is held periodically, namely once a year, to evaluate the implementation of the quality management system and its suitability with the strategic direction of the faculty and study program. The results of the RTM are in the form of decisions and corrective actions on the implementation of the quality assurance system.

Through this mechanism, RTM produces important recommendations that must be implemented by stakeholders in the Faculty of Agriculture, as well as the study programs under it, as an effort to improve sustainable and formulate quality improvement priorities to be selected. The matters considered in determining the priorities of the quality improvement program were discussed in meetings at the work units at the lower levels. The prioritization of the quality improvement program as a result of the RTM recommendations is carried out by paying attention to every relevant aspect of the relevant work units and agreeing on the improvement steps to be taken. After the implementation of RTM, follow-up is carried out in the final framework of the PPEPP cycle, namely control and improvement. Control is carried out to correct the failure to achieve quality standards. Improvements are made if the leadership considers that existing quality standards have been implemented consistently and have become a work culture in the relevant unit. Furthermore, improvements are carried out qualitatively, namely by increasing the indicators of standard achievement without raising the standard itself. Quantitative improvement is carried out by adding indicators of achievement of standards and new standards beyond existing standards.

The main task of GJMF at the Faculty of Agriculture is to ensure that the PPEPP cycle is implemented, especially at the study program level through a series of evaluation activities (summative evaluation and Internal Quality Audit), which are the main ingredients in the implementation of RTM. The availability of valid evidence in the form of quality recording, documentation systems, and publication of internal quality assurance results to stakeholders regarding the quality assurance system at Unmul has been digitally documented through the e-SPMI application. LP3M has developed an SPMI and AMI information system to record and document the implementation of SPMI carried out by study programs within Mulawarman University.

The objectives of the development of SPMI and AMI information systems are:

1. Showing the quality achievements of the institution/Study Program Management Unit (UPPS)/Study Program;
2. Become a managerial tool to ensure that the performance of the institution/UPPS/Study Program through the program that has been achieved can be maintained; and

3. Become a managerial tool in the context of preparing future institutional development plans/UPPS.

Through the SPMI and AMI applications, institutions get the following benefits:

1. Get an overview of the actual condition;
2. Be the basis in improving weaknesses and shortcomings;
3. Be the basis for designing development programs; and
4. Assist in the process of compiling and recording data within the framework of the implementation of AMI and SPME.

Internal Quality Assessment

The quality of the education system and services is a crucial aspect that is the main concern in the quality assurance system at the Faculty of Agriculture, Mulawarman University. Internal quality evaluation is carried out through an annual SPMI-based Internal Quality Audit (AMI-SPMI) by LPPMP. The evaluation process of the implementation of the faculty quality system is carried out through a Management Review Meeting (RTM) which is held at the end of each semester to assess the implementation of the educational process. The Faculty's GJMF also involves the entire academic community (lecturers, education staff, and students) in the quality assurance process through various activities, such as education quality satisfaction surveys and educational services. Lecturer Evaluation by Students (EDOM) is a lecturer performance assessment application that is carried out online by students at the end of each semester. Students are given space to assess the quality of lecturers based on four criteria, namely: Teaching Readiness, Learning Materials, Teaching Discipline, Learning Evaluation, and Lecturer Personality. Lecturers, education staff, and students are also involved in a quality assurance system that aims to evaluate and improve the quality of internal services. At the end of each semester, students are required to fill out an online questionnaire/survey to collect opinions related to the quality of public services, facilities, and infrastructure to support the educational process carried out by the GJM Faculty of Agriculture and all study programs.

External Quality Assessment

Internal control in the quality assurance system of the Faculty of Agriculture involves external assessors who refer to the BAN-PT Standard. The results of the accreditation carried out during the external assessment by BAN-PT are valid for five years. The involvement of external parties is also facilitated to measure the quality of graduates through a survey of the profile of graduates who have been accepted into the world of work. The user satisfaction analysis explains several indicators of graduate ability, namely:

1. Self-development skills
2. Ability to work together
3. Communication skills
4. Ability to use information technology
5. English language skills
6. Expertise in the field of science (main competence)

7. Ethics

Appendix 1. List of courses offered

Semester 1

Yes	MK Code	Course Name	Weight Credits		W/P	Type	Prerequis ite Courses
			Lectures	Internship			
MK101	MU000603W001	Religion	2	1	W	MKU	-
MK102	MU000603W002	São Paulo	2	0	W	MKU	-
MK103	MU000603W004	Indonesian Language	2	0	W	MKU	-
MK104	MU000603W006	Basic Social and Cultural Sciences	2	0	W	MKU	-
MK105	Reference: 220303613W006	Cell Biology	2	1	W	MKI	-
MK106	Reference: 220303623W002	Physics of Agricultural Products	2	1	W	MKI	-
MK202	Reference: 220303612W005	Introduction to Tropical Agricultural Science	2	0	W	MKD	-
MK108	Reference: 220303613W007	Agricultural Chemicals I	2	1	W	MKI	
			16	4			
Number of credits			20				

Semester 2

No	MK Code	Course Name	Weight Credits		W/P	Jenis	Prerequis ite Courses
			Lectures	Internship			
MK201	MU000603W003	Nationality	2	0	W	MKU	-
		Entrepreneurship	2	0	W		
MK107	Reference: 220303612W008	Math	2	0	W	MKD	-
MK203	Reference: 220303623W003	Agricultural English	2	1	W	MKD	-

No	MK Code	Course Name	Weight Credits		W/P	Jenis	Prerequisite Courses
MK204	Reference: 220303622W006	Microbiology of Agricultural Products	2	0	W	MKI	<i>Biology of Agricultural Products</i>
		Professional ethics	2	0			
MK207	Reference: 220303622W005	Food Knowledge	2	0	W	MKI	-
MK208	Reference: 220303622W008	Introduction to artificial intelligence	1	1	W	MKD	-
MK209	Reference: 220303622W009	Agricultural Chemistry II (Combined: Agricultural Chemistry and Physical Chemistry)	3	0	W	MKI	<i>Agricultural Chemicals I,</i>
			18	2			
Number of credits			20				

Semester 3

No	MK Code	Course Name	Weight Credits		W/P	Jenis	Prerequisite Courses
			Lectures	Internship			
MK301	Reference: 220303633W003	Operations Unit	2	1	W	MKI	<i>Physics of Agricultural Products; Math</i>
MK302	Reference: 220303633W005	Biochemistry of Agricultural Products	2	1	W	MKI	<i>Biology of Agricultural Products; Agricultural Chemicals I</i>
MK205	Reference: 220303622W008	Processing Tools and Machinery	2	0	W	MKI	
MK304	Reference: 220303643W001	Research Methodology	2	1	W	MKI	<i>Indonesian Language</i>
MK206	Reference: 220303632W004	Engineering Economics	2	0	W	MKI	<i>Math</i>
MK306	Reference: 220303633W001	Agricultural Statistics	2	1	W	MKI	<i>Math</i>
MK307	Reference: 220303632W002	Microbiology of Agricultural	2	0	W	MKI	<i>Microbiology of Agricultural Products</i>

No	MK Code	Course Name	Weight Credits		W/P	Jenis	Prerequisite Courses
		Product Processing					
MK308	Reference: 220303622W004	Agricultural Products Industry Quality Management System (Combined: Quality Management and Quality Supervision)	3	0	W	MKD	-
			17	4			
Number of credits			21				

Semester 4

No	MK Code	Course Name	Weight Credits		W/P		Prerequisite Courses
			Lectures	Internship			
MK401	Reference: 220303642W006	Food Nutrition	2	0	W	MKI	<i>Agricultural Chemistry II</i>
MK305	Reference: 220303632W007	Physical Properties of Agricultural Products	2	1	W	MKI	<i>Physics of Agricultural Products</i>
MK402	Reference: 220303643W002	Experimental Design	2	1	W	MKI	<i>Agricultural Statistics</i>
MK404	Reference: 220303643W005	Microbiological Analysis of Agricultural Products	1	2	W	MKI	<i>Microbiology of Agricultural Product Processing</i>
MK405	Reference: 220303642W008	Post-Harvest Physiology and Technology	2	0	W	MKI	<i>physical properties of agricultural products; Biochemistry of Agricultural Products</i>
MK406	Reference: 220303622W010	Chemical Analysis of Agricultural Products (Combined: Analytical	3	0	W	MKI	<i>Agricultural Chemistry II</i>

No	MK Code	Course Name	Weight Credits		W/P		Prerequisite Courses
		Chemistry and AKHP)					
MK407	Reference: 220303632W009	Agricultural Product Chemical Analysis Practicum	0	2	W	MKI	<i>Agricultural Chemistry II + Agricultural Product Chemical Analysis</i>
MK408	Reference: 220303642W009	Agricultural Food Processing Technology	2	2	W	MKI	<i>Operation Unit; Processing Tools and Machinery</i>
			14	8			
Number of credits			22				

Semester 5

No	MK Code	Course Name	Weight Credits		W/P	Jenis	Prerequisite Courses
			Lectures	Internship			
MK501	Reference: 220303663W002	Sensory Tests	2	1	W	MKI	<i>Agricultural Statistics</i>
	Reference: 220303642W003	Sanitation and Safety of the Food Processing Industry	2	0	W	MKI	<i>Microbiology of Agricultural Products</i>
	Reference: 220303632W006	Plant Layout and Design	2	0	W	MKI	<i>Agricultural Product Physics, Mathematics</i>
MK503	Reference: 220303653W002	Agricultural Product Preservation, Packaging and Storage Technology	2	1	W	MKI	<i>Agricultural Chemistry II</i>

No	MK Code	Course Name	Weight Credits		W/P	Jenis	Prerequisite Courses
MK504	Reference: 220303672W002	Fieldwork Practice	0	2	W	MKI	<i>Had been Completion ≥ 75 credits from total credits that must devote without nilai E, IPK $\geq 2,00$</i>
MK505	Reference: 220303662W004	Operations Research	2	1	W	MKI	<i>Physics of Agricultural Products; Math</i>
MK506	Reference: 220303642W004	Food Regulation	2	0	W	MKI	-
			12	5			
Number of credits			17				
<i>Elective Courses (Semester 5)</i>							
MKP501	220303652P006	Humid Tropical Spice and Herbs Technology (Combined : Refresher	2	1	P	MKI	<i>Processing Process Technology</i>

No	MK Code	Course Name	Weight Credits		W/P	Jenis	Prerequisite Courses
		Technology, Spice Technology and Essential Oils)					
MKP502	220303652P015	Food Additives	2	0	P	MKI	<i>Agricultural Chemistry II</i>
MKP503	220303652P009	Palm, Rubber and Tobacco Technology	2	0	P	MKI	<i>Processing Process Technology</i>
MKP504	220303652P011	Food Fortification Technology	2	0	P	MKI	<i>Processing Process Technology</i>
MKP505	220303662P011	Industrial Microbiology	2	0	P	MKI	<i>Biochemistry of Agricultural Products; Microbiology of Agricultural Products</i>
			10	1			
			11				

Semester 6

No	MK Code	MK Name	Weight Credits		W/P	Jenis	Prerequisite Courses
			Lectures	Internship			
MK601	Reference: 220303661W001	Thesis Assistance I	0	1	W	MKI	-
		Product Innovation and Marketing	1	2			
			1	3			

No	MK Code	MK Name	Weight Credits		W/P	Jenis	Prerequisite Courses
Number of credits			4				
MKP601	220303663P005	Fruit and Vegetable Technology	2	1	P	MKI	Processing Process Technology
MKP602	220303662P006	Functional Food Processing Technology	2	0	P	MKI	processing process technology; Food Nutrition
MKP603	220303662P007	Lactic Acid Bacteria Technology	2	0	P	MKI	Microbiology of Agricultural Product Processing
MKP604	220303663P010	Sugar and Polysaccharide Technology	2	0	P	MKI	Processing Process Technology
MKP605	-	Nutrition Evaluation in Food Processing	2	1	P	MKI	Food Nutrition
MKP606	220303653P010	Livestock and Aquatic Products Technology	2	1	P	MKI	-
MKP607	220303662P015	Halal Food Technology and Management	2	0	P	MKI	-
			14	3			
			27				
Elective Courses (Semester 6)							
MKP608	220303662P013	Selected Topic 1 Carry out tasks in the food/agricultural product industry given by the industry for a minimum of 6 weeks including formulation, solution plan and implementation of problem/task solving, data processing, report preparation and	0	2		MKI	

No	MK Code	MK Name	Weight Credits		W/P	Jenis	Prerequisite Courses
		<i>presentation of internship assignment report (examiner)</i>					
MKP609	220303662P014	Selected Topic 2 <i>Contains student academic activities to accommodate student mobility activities with credits in accordance with partner universities and can be carried out in Even Semesters</i>	0	3		MKI	.
MKP601 0	220303662P015	Selected Topic 3 <i>Carrying out activities to develop appropriate technology, healthy food education, or improve the quality of MSME products in the village.</i>	0	4	P	MKI	
MKP601 1	220303662P016	Industrial Internship <i>Carry out tasks related to the food industry (food) and agricultural products provided by the industry for one semester.</i>	0	12	P	MKI	<i>Street vendors</i>
MKP601 2	220303662P017	Independent Project <i>Developing innovative</i>	0	6	P	MKI	

No	MK Code	MK Name	Weight Credits		W/P	Jenis	Prerequisite Courses
		<i>products based on student ideas; conducting independent research and development or working with partners to produce innovative products.</i>					
			0	27			
		Number of credits	27				

Semester 7

No	MK Code	MK Name	Weight Credits		W/P	Jenis	Prerequisite Courses
			Lectures	Internship			
MK701	Reference: 220303671W001	Thesis Assistance II	0	1	W	MKI	-
MK702	MU0000603W007	Real Work Lecture/ Thematic KKN/ Building Villages/ Humanitarian Tasks	0	3	W	MKI	Had been Completion ≥ 110 credits without Value E, GPA ≥ 2.00 for KKN Regular, or had been Finished teori untuk KKN non regular
MK703	Reference: 220303672W003	Seminar 1	0	1	W	MKI	Had been Completion ≥ 110 credits without Value E, IPK $\geq 2,00$
MK704	Reference: 220303672W003	Seminar 2	0	1	W	MKI	Had been Completion ≥ 110 credits without Value E,

No	MK Code	MK Name	Weight Credits		W/P	Jenis	Prerequisite Courses
							IPK \geq 2,00
			0	6			
			6				

Elective Courses (Semester 7)

MKP701	220303652P013	Agricultural Industrial Waste Handling and Treatment Technology	2	0	P	MKI	<i>Agricultural Chemistry II; Microbiology of Agricultural Products</i>
MKP702	220303653P014	Oil and Fat Technology	2	1	P	MKI	<i>Agricultural Chemistry II; Processing Process Technology</i>
MKP703	220303653P008	Flour, Cake and Bread Technology	2	1	P	MKI	<i>Processing Process Technology</i>
MKP704	220303662P012	Warehousing Management	2	0	P	MKI	<i>Post-Harvest Physiology and Technology</i>
MKP705	220303662P013	Food Service Technology and Management	2	0	P	MKI	-
MKP706	220303662P014	Tropical Agricultural Products Technology (New MK Proposal) Development of economically valuable products from the humid Tropical environment	2	0	P	MKI	Commodities that are not included in the course
			12	2			
			14				
MKP707		Selected Topic 1	0	2	P	MKI	
MKP708		Selected Topic 2	0	3	P	MKI	
MKP709		Selected Topic 3	0	4	P	MKI	
MKP7010		Industrial Internship	0	12	P	MKI	
MKP7011		Independent Project	0	6	P	MKI	
			0	27			

No	MK Code	MK Name	Weight Credits	W/P	Jenis	Prerequisite Courses
Number of credits			27			

Semester 8

No	MK Code	MK Name	Weight Credits		W/P	Jenis	Prerequisite Courses
			Lectures	Internship			
MK705	Reference: 220303676W004	Thesis	0	6	W	MKI	Had been Completion \geq 110 credits without Value E, IPK \geq 2,00
Number of credits			6				
Cumulative Number of Credits			144				