USK
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OUTCOME BASED EDUCATION CURRICULUM

AGRICULTURAL PRODUCT TECHNOLOGY

FACULTY OF AGRICULTURE
UNIVERSITAS SYIAH KUALA

OBE CURRICULUM GUIDEBOOK DEVELOPMENT TEAM

PROGRAM STUDY OF AGRICULTURAL PRODUCT TECHNOLOGY

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TABLE OF CONTENTS

I. CURRICULUM FOUNDATION

The rapid development of science and technology in recent years has brought about significant changes in various aspects of society, the workforce, and industries. These changes have also influenced human lifestyles, thought patterns, and interactions among individuals and with nature. Among the driving factors behind these changes are the advancements in computer technology, information, and telecommunications, which have made it possible to replace many human jobs with robots and artificial intelligence. Data processing has become faster and more comprehensive, supported by global database systems, enabling quicker and more precise decision-making. The world has entered the era of Industry 4.0, where many jobs have been replaced by automation. The world has become smaller, and people are interconnected across various parts of the globe.

Today's students must have broad perspectives and not be limited to a single field of study. They should possess the competencies needed in the workforce, adaptability to change, creativity, innovation, and the ability to learn throughout their lives. Graduates of higher education institutions should master their respective fields of knowledge and have a grasp of other areas to enrich their knowledge. After graduation, they can contribute to societal development.

Therefore, higher education institutions must also evolve, adapting to the rapidly changing world and anticipating the present and future needs. Higher education institutions should recognize that they are no longer the sole source of information and learning. Higher education needs to engage with industries and collaborate with other institutions to remain relevant and not fall behind.

In anticipation of these changes, the Study Program of Agricultural Product Technology (SP-APT) is revising its curriculum to produce graduates who meet the needs of society in the present and future. Graduates should have the skills required in their field and possess high competitiveness in a job market that is becoming increasingly limited. The SP-APT has gathered input from various sources, including the business sector (Indonesian Food and Beverage Entrepreneurs Association - GAPMMI), the Indonesian Association of Food Technologists (PATPI), the Association of Agroindustrial Technology Professionals (APTA), as well as contributions from local government agencies and experts in the field. The curriculum is designed

with reference to the guidelines issued by The International Food Technologist (IFT) in 2018 and the three competency pillars of APTA.

In order to enhance graduates' competencies, the current Study Program of Agricultural Product Technology (SP-APT) curriculum provides numerous opportunities for students to gain study experiences in other higher education institutions, intern in industries and communities, and select additional competencies to complement their core competencies in agricultural technology. The SP-APT curriculum for 2021 – 2025 offers flexibility for students to choose, with the expectation of producing outstanding graduates who are devout, cultured, knowledgeable, professional, competitive, and contribute positively to the nation's well-being.

II. VISION, MISSION, OBJECTIVES, AND STRATEGY

2.1 Department Vision

The vision of the Agricultural Product Technology (APT) Department is to become an innovative, self-reliant, and leading department in Southeast Asia in the fields of agricultural technology education, research, and community engagement.

2.2 Department Mission

The mission of the APT Department is to:

1. Provide quality education based on research to produce highly competitive and character-rich graduates in the field of agricultural technology.
2. Conduct high-quality and innovative research in the field of agricultural technology to support regional, national, and international development.
3. Engage in community service based on research application.
4. Implement a sustainable academic quality assurance system to maintain the quality and competence of graduates.
5. Foster mutually beneficial collaborations with relevant institutions, both domestic and international, to ensure the sustainability of education, research, and community engagement processes.

2.3 Study Program Objectives (Program Educational Objectives/PEO)

The objectives of the APT Study Program are to produce innovative, independent, and highly competitive graduates in the fields of food technology and agricultural industry who can pursue careers as **managers or supervisors, entrepreneurs, educators or consultants, program officers, assistant researchers, community leaders, and knowledge absorbers and developers**, with the following criteria:

PEO1 Apply food science and agricultural industrial technology to address agricultural product technology-related issues.

PEO2 Develop self-capacity through lifelong learning.

PEO3 Work with ethics and integrity to make positive contributions to society.

PEO4 Empower local agricultural resources into globally competitive food products.

2.4 Study Program Strategy

The APT Study Program strategy, based on the 2020-2024 SP-APT Roadmap, aims to achieve the vision and mission of the APT Department, including:

1. Active engagement as a university service institution through laboratory services and competency training programs.
2. Implementation of Merdeka Belajar – Kampus Merdeka (Emancipated Learning – Emancipated Campus) Curriculum.
3. Engagement in educational and research programs with companies, research institutions, and universities, both domestically and internationally.
4. Evaluation of programs to enhance graduate quality.
5. Preparation and completion of international accreditation activities based on an output-based process.
6. Implementation of activities supporting improvements in teaching and learning, further education for faculty, and enhancement of educational staff's professional competence according to their areas of interest.
7. Strengthening community engagement through village and industry development programs and community service programs.

III. CURRICULUM DEVELOPMENT

3.1 Curriculum Development Process

The curriculum revision workshops in support of the Emancipated Learning – Emancipated Campus (Merdeka Belajar - Kampus Merdeka - MBKM) program have been conducted in several stages of activities, including:

1. The first workshop, "Introduction to the Emancipated Learning – Emancipated Campus (MBKM) Program," by Vice Dean I of the Faculty of Agriculture (Dr Yuliani Aisyah) on September 1, 2020.
2. The second workshop, "Competencies of Food Technology Graduates for Industry Needs," by the Indonesian Food and Beverage Entrepreneurs Association (GAPMMI) Chairman Adhi S. Lukman, on October 7, 2020.
3. The third workshop, "Curriculum Design for Future Food Technology Bachelor's Programs," by Dr Feri Kusnandar (Chairman of the Department of Food Science and Technology at IPB University) on October 15, 2020.
4. The workshop for the development and adjustment of the APT study program curriculum based on the guidelines for Emancipated Learning – Emancipated Campus (MBKM) was conducted online and in person at the Multi-Purpose Room of the Faculty of Agriculture. This activity took place on November 4-5, 2020.
5. The finalization workshop for the curriculum based on the Emancipated Learning – Emancipated Campus (MBKM) guidelines in Momong, Lhoknga, on November 19, 2020.
6. Curriculum discussion workshop at the Multi-Purpose Room of the Faculty of Agriculture, held on February 11, 2021.

The Curriculum Discussion Team was officially appointed by Rector's Decree Number 24/UN11.1.5/KPT/2021, chaired by Dr. Santi Noviasari, S.TP., M.Si.

After obtaining materials and input from various experts, the APT study program's faculty members and educational staff developed a new curriculum by revising the 2016 Study Program of Agricultural Product Technology (SP-APT) Curriculum and implementing the MBKM program. The curriculum development teams, consisting of faculty members, attempted to

formulate a curriculum that accommodates the Emancipated Learning – Emancipated Campus (MBKM) program. Each team presented their formulated outcomes based on pre-designed work details.

This activity was highly intensive and productive, involving the entire academic community of the APT Study Program. It was conducted to broaden the perspectives of the teaching staff at the APT study program regarding the latest developments in curriculum and the Emancipated Learning – Emancipated Campus (MBKM) program. Some key takeaways from the workshop were:

- SP-APT must reconstruct the curriculum in line with the Industry 4.0 era.
- Changes in the Industry 4.0 curriculum's structure must support the MBKM program's implementation.
- Eight (8) types of learning activities can be chosen in the MBKM program, namely: 1) student exchange, 2) internship, 3) entrepreneurship, 4) research, 5) independent projects, 6) teaching assistance, 7) thematic community service (KKN), and 8) humanitarian projects.
- The competency domains defined in the SP-APT curriculum will follow the Institute of Food Technology (IFT) and the Indonesian Association of Food Technologists (PATPI).
- The SP-APT curriculum can also include local or distinctive competencies based on available resources, whether at the program, faculty, university, or regional level.

Subsequently, during this internal workshop, several steps were outlined to refine further the reconstruction of the SP-APT curriculum, including:

- Conducting surveys to gather feedback and suggestions from the SP-APT alumni to determine whether their understanding and skills as graduates of the SP-APT have helped them secure employment and work professionally. The goal is to obtain recommendations for improvement and enhancement.
- Conducting surveys to gather feedback and suggestions from employers of SP-APT graduates, providing insights into the competencies needed by employers of SP-APT graduates.
- Seeking input from the business sector regarding the competencies needed to produce job-ready APT graduates. Therefore, webinars will be held with speakers from GAPMMI.

- Gathering input from the professional organization PATPI regarding the competencies required for a food technology graduate.

3.2 Tracer Study

The alumni tracking conducted by SP-APT aims to gather information regarding alumni's domicile, waiting period for their first job, job types, initial salary earnings, and the alignment between the competencies/skills acquired and the job market requirements. The tracking is carried out through telephone, SMS, utilization of the APT alumni mailing list (alumni_thp_unsyiah@yahoo.com), and internet-based social media accounts such as Facebook and WhatsApp. A structured and intensive alumni tracking process is conducted through an online mechanism on the Google Forms platform, accessible through the following link: https://forms.gle/1dGG56B4xsaHtedDA.

The tracer study results regarding the fields of employment for SP-APT alumni indicate that most alumni are employed in government institutions. The second-largest percentage is employed in the private sector. The largest portion of alumni's first salaries is equal to or less than Rp. 2,500,000. The waiting period to secure a job is typically less than or equal to 3 months. This suggests that many alumni have prepared themselves and possess the competencies required for employment. Based on the tracer study conducted, several competencies needed according to alumni's assessments of their current activities include the ability to work independently, work ethic (discipline, diligence, responsibility, and time management), the ability to work under pressure and teamwork skills.

3. Feedback and Input Gathering from Graduate Employers

The purpose of conducting a stakeholder survey for the Agricultural Technology Program is twofold: 1) to capture alumni user perceptions of the competencies of Agricultural Technology Program graduates and 2) to identify the competencies expected of Agricultural Technology Program graduates. Based on the survey results, stakeholder assessments indicate that SP-APT graduates excel in several aspects, such as integrity, project/program management, loyalty, adaptability, teamwork, independent work, communication skills, knowledge of agricultural technology, and professionalism.

The Agricultural Technology Program at the Faculty of Agriculture, Unsyiah (SP-APT - USK), observes that there have been dynamic changes related to the development of science and technology, industry needs, and other stakeholders' expectations regarding the competencies of APT Program graduates in the future. Strengthening and improving the curriculum is essential to produce APT-USK graduates who align with industry and stakeholder needs and can play a vital role in the workforce. Therefore, SP-APT-USK has initiated the process of Gathering Input from Stakeholders through an online survey. Stakeholders willing to provide input come from various institutions, including Bulog, BPTP Aceh, the Agricultural Extension Center of Bubon District, ATI Padang Polytechnic, the Center for Plantation Research and Development, and Local Government-Owned Enterprises. These organizations represent both state-owned and private enterprises and government agencies.

4. Recommendations from the GAPMMI Organization

The rapid and dynamic changes in all aspects over the last decade, primarily driven by digital technology, information, and robotics, have resulted in swift adaptability by the business and industrial sectors. This has lagged behind the education sector, with higher education graduates perceived as less prepared to enter the workforce due to shifting competency requirements. Every higher education institution must respond promptly and accurately, necessitating a transformation in learning to equip and prepare graduates to excel in their careers. Therefore, in addition to feedback from alumni and user graduates, input from the business sector is also crucial in efforts to produce graduates who are better prepared for the working world.

In this regard, the APT study program has taken the initiative to conduct online discussion forums, inviting Mr. Adhi S. Lukman, Chairman of the Indonesian Food and Beverage Entrepreneurs Association (GAPMMI), as the keynote speaker. This activity aims to gather input for the renewal of the undergraduate curriculum of the APT study program in line with the needs of the industrial world. During this event, the speaker conveyed that the Indonesian government has chosen the Food and Beverage industry as a pivotal player in Indonesia 4.0. The Food and Beverage industry must be capable of harnessing technological advancements and meeting consumer demands. Focus on product customization and customer service takes precedence over efficiency. In supporting the MBKM program, the GAPMMI organization has already collaborated

with the Ministry of Industry, particularly vocational schools. For higher education, internship programs are in place and are typically regular programs.

IV. GRADUATE PROFILE & FORMULATION OF GRADUATE LEARNING OUTCOMES (GLO)

4.1 Graduate Profile

Table 1. Graduate Profile of the Agricultural Product Technology Study Program

No	Graduate Profile (Level 6)	Description
1	**Manager or Supervisor**	SP-APT graduates can play roles in industries or companies related to the agricultural supply chain and the processing of agricultural products into food or non-food products as managers or supervisors in the fields of production, food safety and health, quality analysis and control, occupational safety, supply chain management, logistics, sales, and marketing, as well as agricultural, industrial environmental management.
2	**Entrepreneur**	SP-APT graduates can function as entrepreneurs capable of economically, effectively, and efficiently managing available resources while enhancing productivity, economic value, and commercialization, especially in agricultural business and industry commodities.
3	**Counselor or Consultant**	SP-APT graduates can serve as counselors or consultants, providing education, guidance, information, and knowledge transfer related to the design, analysis, process control, product development, and increased productivity of agricultural industrial systems to the community.
4	**Program Officer**	SP-APT graduates can play a role as planners or implementers of program activities in government institutions, such as ministries related to the fields of industry, trade, food, and agriculture.
5	**Research Assistant**	SP-APT graduates can function as research assistants, supporting experimental research and/or literature studies in the field of food technology and the agricultural industry. They ensure that all research documents and data are properly stored and prepare research reports following scientific research standards as directed by the lead researcher.
6	**Community Leader**	SP-APT graduates can serve as community leaders with knowledge of leadership and development strategies in agricultural and related fields to create prosperous communities.

7	**Knowledge applicators and Developers**	SP-APT graduates can act as knowledge applicators and developers, mastering the fundamental sciences in the fields of food technology and related agricultural industries to advance knowledge and technology through both formal and non-formal education.

4.2 Formulation of Graduate Learning Outcomes

Table 2. Graduate Learning Outcomes of the Agricultural Technology Study Program

No	ASPECTS OF COMPETENCE	GRADUATE LEARNING OUTCOMES (GLO)
1	**ATTITUDE AND BEHAVIOR (A)**	1. Have faith in God Almighty, and uphold the values of honesty, trustworthiness, and responsibility. 2. Have morals and ethics in carrying out duties professionally. 3. Innovative and creative in working independently and in teams to solve problems and challenges with lifelong learning. 4. Sensitive and concerned about social, community, and environmental developments.
2	**KNOWLEDGE (K)**	1. Master the theoretical concepts of mathematics, chemistry, physics, biology, microbiology, and materials in agricultural technology. 2. Master the knowledge of management, engineering, communication, and entrepreneurship to produce safe, halal, and value-added products. 3. Master scientific principles in solving agricultural technology problems
3	**SPECIFIC SKILLS (SS)**	**a. Concentration: Food Technology** 1. Able to process agricultural products based on biochemical and food nutrition concepts 2. Able to design and implement food safety systems in the processing of agricultural products 3. Able to develop and test the quality of agricultural products in a measurable manner **b. Concentration: Agricultural Industry Technology** 1. Able to design technically and economically viable industries. 2. Able to design and integrate effective and efficient industrial management systems. 3. Able to plan and control production and inventory activities throughout the agricultural industry production chain.
4	**GENERAL SKILLS (GS)**	1. Able to make informed decisions in solving problems based on science and technology of agricultural products.

		2. Able to work independently and in teams across various disciplines and cultures. 3. Able to analyze data and information logically, critically, and systematically. 4. Able to communicate effectively both verbally and in writing. 5. Able to maintain and expand professional networks

4.3 Correlation Matrix between GLO and Graduate Profile

Table 3. Correlation Matrix between CPL and Graduate Profile of the Agricultural Technology Program

Graduate Profile	GLO																	
	Attitude				Knowledge			Specific Skills						General Skills				
								Food Technology			Agricultural Industry Technology							
	1	2	3	4	1	2	3	1	2	3	1	2	3	1	2	3	4	5
Manager or Supervisor																		
Entrepreneur																		
Counselor or Consultant																		
Program Officer																		
Research Assistant																		
Community Leader																		

Knowledge applicators and Developers																		

V. DETERMINATION OF SUBJECT MATTER

5.1 Body of Knowledge (BoK) Overview

The Body of Knowledge (BoK) of the Agricultural Product Technology Program consists of food science and technology fundamentals and agricultural and industrial technology. These two BoKs encompass nine areas of study, which are:

1. Food Chemistry and Agricultural Products
2. Microbiology
3. Product Processing Engineering
4. Food and Agricultural Product Law and Regulations
5. Data Analysis and Statistics
6. Communication
7. Entrepreneurship
8. Professionalism
9. Quality Assurance Systems

The Food Technology BoK is structured based on the curriculum standards of the Indonesian Food Technologists Association (PATPI), which refer to the curriculum standards of The International Food Technologist (IFT) in 2018. The Food Technology BoK includes three additional areas of study:

1. Food Safety
2. Sensory Science
3. Food Biochemistry and Nutrition

The Agricultural Industry Technology concentration is developed in accordance with the learning outcome formulations of the Indonesian Agroindustrial Technology Professional Association (APTA) in 2014, the results of the Strengthening Competence and Curriculum-based Engineering-Based Agroindustrial Technology Program FGD in Malang on March 28-29, 2018, the curriculum workshop results using the OBE approach and the formulation of learning outcomes for graduates of agricultural industry study programs in Denpasar on February 4-5, 2020, and the

MBKM consolidation results from the Indonesian Agricultural Industry Program Study Chair Forum on January 18, 2021.

The Agricultural Industry Technology BoK includes four additional areas of study:

1. Systems Engineering
2. Industrial Management
3. Information Systems and Decision-Making
4. Industrial Design

5.2 Correlation Matrix between GLO and Subject Matter

Table 4. Relationship between GLO and Subject Matter of the Agricultural Product Technology Study Program

Subject Matter	GLO																	
	Attitude				Knowledge			Specific Skills						General Skills				
								Food Technology			Agricultural Industry Technology							
	1	2	3	4	1	2	3	1	2	3	1	2	3	1	2	3	4	5
Food Chemistry and Agricultural Products					√			√										
Microbiology					√				√	√								
Product Processing Engineering						√			√	√								
Food and Agricultural Product Laws and Regulations						√				√								
Data Analysis and Statistics					√		√			√	√							
Communication	√	√	√	√											√		√	√
Entrepreneurship	√	√	√	√										√	√	√	√	√
Professionalism	√	√	√	√										√		√		

Quality Assurance Systems						√			√	√		√	√					
Food Safety								√	√	√								
Sensory Science								√	√	√								
Food Biochemistry and Nutrition								√	√	√								
Systems Engineering											√	√	√					
Industrial Management											√	√	√					
Information Systems and Decision-Making											√	√	√					
Industrial Design											√	√	√					

5.3 Description of Subject Matter

Table 5. Subject Matters in the Body of Knowledge (BoK) of Food Technology and Agricultural Industrial Technology

Code	Subject Matter	Description
1	Food Chemistry and Agricultural Products	a. Basic chemistry of the properties and reactions of various product components b. Chemical principles used to control reactions within products c. Major chemical reactions limiting the shelf life of products d. Basic and applied laboratory techniques commonly used for chemical analysis e. Analytical chemistry to solve practical problems
2	Microbiology	a. Relevant beneficial microorganisms, pathogens, and spoilage organisms in food and their growth conditions

Code	Subject Matter	Description
		b. Conditions under which relevant pathogens are destroyed or controlled in products c. Identification of microorganisms in products d. Principles involved in food preservation through fermentation processes e. Adaptation and environmental factors (e.g., water activity, pH, temperature) affecting the growth and inactivation responses of microorganisms in different environments
3	Product Processing Engineering	a. Mass and heat transfer, fluid flow, thermodynamics b. Mass and energy balances for the production process of specific products c. Characteristics and physiology of food materials d. Equipment and unit operations for producing specific products in laboratories or pilot plants e. Product processing and preservation technology f. Packaging materials and methods g. Hygiene and sanitation in processing facilities h. Methods for managing water and waste i. Product development technology
4	Food and Agricultural Product Law and Regulations	a. The government regulations framework required for the production and sale of food and agricultural products b. Formulation of policies for the food and agricultural product industry c. Sources of law and regulations related to the food and agricultural product industry
5	Data Analysis and Statistics	a. Statistical principles in the application of food and agricultural sciences b. Data collection and analysis technology c. Visual representation of data
6	Communication	a. Oral and written communication b. English language c. Information about food science and the agricultural industry for various audiences
7	Entrepreneurship	a. Micro and macroeconomic principles b. Supply chain of agricultural and food products c. Development of ideas and new products acceptable to the market d. Feasibility analysis of the food and agricultural industry
8	Professionalism	a. Ability to work independently and in teams b. Lifelong learning

Code	Subject Matter	Description
		c. Intercultural communication d. Values and ethics in food science
9	Quality Assurance Systems	a. Quality and safety of food b. Quality assurance and halal principles c. Food quality control systems

Table 6. Subject Matters in the Body of Knowledge (BoK) of the Food Technology

No.	Field of Competence	Description
1	Food Safety	a. Identification of potential hazards and food safety issues b. Contamination and methods for controlling physical, chemical, and biological/microbiological food hazards c. Sampling techniques
2	Sensory Science	a. Human physiological and psychological fundamentals b. Sensory testing methods c. Experimental design and statistical methods for sensory studies
3	Food Biochemistry and Nutrition	a. Biochemical processes, concepts, and human nutrition evaluation b. Nutrition and functional foods

Table 7. Fields of Study in the Body of Knowledge (BoK) of Agricultural Industry Technology

No.	Field of Competence	Description
1	Systems Engineering	a. Mathematical modeling to solve problems in complex industrial systems
2	Industrial Management	a. Design and control of goods and production b. Productivity and human resource management c. Production and logistics management in the agricultural industry d. Digital information technology and marketing management e. Occupational health and safety

No.	Field of Competence	Description
3	Information Systems and Decision-Making	a. Programming languages and computer applications in the food and agriculture industry b. Databases and management information systems c. Decision making
4	Industrial Design	a. Material handling layout and equipment operation procedures in the food and agriculture industry b. Industrial design methods

VI. COURSE DEVELOPMENT

The formation of courses is carried out by selecting relevant GLO items as the basis for development. Each course created should ideally encompass elements of attitude, knowledge, and skills. The field of study represents a body of knowledge that indicates a cluster of knowledge or an area of study that forms the core of a program (Body of Knowledge). Within each GLO item of the study program, there are subjects of study that are used to create courses. These subjects of study that shape the courses consist of one or more branches of knowledge or a group of integrated knowledge that forms a new understanding, which is agreed upon by the program's field forum and represents the characteristic knowledge field of the program. The selection of subjects of study found in GLO items is carried out simultaneously, and these subjects are then detailed and explored in more depth as learning materials. The subjects of study and learning materials can be updated in line with the development of knowledge and technology. Determining the subjects of study and learning materials should involve the various academic disciplines within the program.

Students require a certain amount of time to achieve an understanding formulated in a course. The time students need to acquire the abilities outlined in a course is expressed as the credit weight of a course (SKS). In determining the credit weight, several factors must be considered:

a) The ability to achieve GLO items assigned to the course, represented in Course Learning Outcomes (CLO)
b) The breadth and depth of the course's learning materials
c) The teaching method chosen in the teaching and learning process
d) The teaching media used to support learning

Based on the results of the formulation using the Body of Knowledge for agricultural product technology (APT), the subject matter of APT includes compulsory general courses, compulsory faculty courses, compulsory program courses, specialization courses, elective courses, and specific skills and Emancipated Learning – Emancipated Campus (Merdeka Belajar Kampus Merdeka or MBKM). The main subject matter of APT is adapted to the dynamics of resources, industrial developments, and agricultural science and technology in the present and future. To provide a foundational understanding of agricultural science and technology, APT includes basic knowledge fields such as chemical analysis of agricultural products, microbiology, food safety, and engineering processes. Additionally, APT divides focused study areas according to students' interests and the developments in agricultural science and technology through the division of food science and agricultural technology clusters. APT also determines soft skills/supporting study areas to equip students with additional skills.

Table 8. Correlation Matrix between GLO and Course

No	Course Code	Course Title	Attitude and Behavior (A)				Knowledge (K)			Special Skills (KK)						General Skills (KU)				
										Food Technology			Agricultural Industry Technology							
			1	**2**	**3**	**4**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**1**	**2**	**3**	**4**	**5**
Food Chemistry and Agricultural Products																				
1	TPI103	Chemistry I											v							
2	TPI102	Organic Chemistry					v						v							
3	TPI114	Packaging Technology									v				v					
4	TPI116	Packaging Technology Lab									v				v	v				
5	TPI118	Chemistry II					v			v	v		v							
6	TPI211	Food Chemistry						v		v										
7	TPI204	Agricultural Product Analysis					v					v								
8	TPI206	Agricultural Product Analysis Lab					v					v				v	v			
Microbiology																				
1	TPI101	Biology											v							
2	TPI108	Microbiology					v			v	v		v							
3	TPI110	Microbiology Lab					v			v	v		v			v	v			
4	TPI263	Fermentation Technology								v	v									
5	TPI265	Fermentation Technology Lab									v					v	v			
6	TPI262	Processing Technology I								v										
7	TPI264	Processing Technology I Lab										v				v				
8	TPI266	Food Safety						v			v									
9	TPI268	Food Safety Lab					v				v					v				
Product Processing Engineering																				

1	PEN101	Introduction to Agricultural Science										v							
2	TPI101	Biology										v							
3	TPI103	Basic Chemistry I										v							
4	TPI107	Physics																	
5	TPI104	Calculus					v					v							
6	TPI114	Packaging Technology									v			v					
7	TPI116	Packaging Technology Lab									v			v	v				
8	TPI118	Basic Chemistry II					v			v	v		v						
9	TPI209	Unit Operations I									v		v						
10	TPI263	Fermentation Technology								v	v								
11	TPI265	Fermentation Technology Lab									v				v	v			
12	TPI202	Unit Operations II									v		v						
13	TPI262	Processing Technology I								v									
14	TPI264	Processing Technology I Lab										v			v				
15	TPI266	Food Safety						v			v								
16	TPI268	Food Safety Lab					v				v				v				
17	TPI303	Industrial Sanitation						v			v			v					
18	TPI305	Halal Assurance System						v			v			v					
19	TPI307	Halal Assurance System Lab						v							v	v			
20	TPI365	Processing Technology II								v									
21	TPI367	Processing Technology II Lab								v					v	v			
22	TPIP08	Waste Processing Technology					v	v					v						
23	TPIP09	Product Development Technology										v	v		v				
24	TPIP10	Product Development Technology Lab								v	v	v	v		v	v	v		
25	TPI209	Unit Operations I									v		v						

26	TPI513	Animal and Aquatic Product Technology								v			v		v				
27	TPI527	Bioprocess Technology								v			v		v				
28	TPI529	Sugar Technology								v			v		v				
29	TPI514	Fruit and Vegetable Technology								v					v				
30	TPI520	Coffee and Barista Technology								v					v				
31	TPI524	Dairy and Dairy Product Technology								v					v				
32	TPI526	Bakery Technology								v									
33	TPI530	Polymer Technology								v									
34	TPI515	Oil and Fat Technology								v									
35	TPI531	Bioenergy Technology								v									
36	TPI532	Starch Technology								v									
37	TPI538	Essential Oil Technology						v											
38	TPI533	Cocoa and Confectionery Technology								v					v				
39	TPI537	Beverage Technology						v		v	v								
40	TPI536	Food Nanotechnology						v											
41	TPI542	Specialty Foods								v							v		
42	TPI535	Food Fortification						v			v								
Food and Agricultural Product Law and Regulations																			
1	TPI114	Packaging Technology									v				v				
2	TPI116	Packaging Technology Lab									v				v	v			
3	TPI207	Occupational Health and Safety									v				v			v	
4	TPI261	Food Additives									v	v							
5	TPI266	Food Safety						v			v								
6	TPI305	Halal Assurance System						v			v				v				
7	TPI307	Halal Assurance System Lab						v								v	v		

8	TPI309	Food Regulations and Industry						v			v				v					
9	TPI361	Functional Foods								v										
10	TPIP11	Industrial Project Planning										v	v	v						
Data Analysis and Statistics																				
1	TPI105	Basic Mathematics											v							
2	TPI106	Basic Statistics					v						v							
3	TPI112	Basics of Computer					v									v				
4	TPI203	Statistical Methods						v										v		
5	TPI205	Statistical Methods Lab						v										v		
6	TPI301	Research Methods and Scientific Writing							v									v	v	
7	TPI363	Sensory Evaluation										v								
8	TPIP11	Industrial Project Planning										v	v	v						
9	TPIP12	Industrial Project Planning Lab									v				v	v	v			
10	TPIP13	Supply Chain and Logistics Management						v												
11	TPIP15	Quality Management Systems						v												
12	TPIP20	Final Project/Thesis			v											v	v	v	v	
Communication																				
1	MKS201	English Language														v		v		
2	MKS101	Indonesian Language																v		
3	PEN301	Agrotechnopreneurship						v							v			v		v
4	PEN302	Agrotechnopreneurship Practice						v								v	v	v	v	v
5	TPI301	Research Methods and Scientific Writing							v									v	v	

6	TPIP07	Industrial Communication																	v	
7	MKSP02	Community Service		v	v	v										v	v	v	v	v
8	TPIP16	Field Practice		v												v	v	v	v	v
9	TPIP18	Research Proposal Seminar														v	v		v	
10	TPIP19	Research Results Seminar														v	v		v	
11	TPIP20	Final Project/Thesis			v											v	v	v	v	
12	TPIP01	Internship		v	v											v	v	v	v	v
13	TPIP02	Entrepreneurship		v	v											v	v	v	v	v
14	TPIP03	Village Development		v	v	v										v	v	v	v	v
15	TPIP04	Independent Project		v	v											v	v	v	v	v
16	TPIP05	Humanitarian Project		v	v	v										v	v	v	v	v
17	TPIP06	Teaching Assistant at Educational Institutions		v	v											v	v	v	v	v
Entrepreneurship																				
1	PEN301	Agrotechnopreneurship						v							v			v		v
2	PEN302	Agrotechnopreneurship Practice						v								v	v	v	v	v
3	TPI309	Food Regulations and Industry						v			v				v					
4	TPIP09	Product Development Technology										v	v			v				
5	TPIP10	Product Development Technology Lab								v	v	v	v		v	v	v			
6	TPIP11	Industrial Project Planning										v	v	v						
7	TPIP12	Industrial Project Planning Lab									v				v	v	v			
8	TPIP14	Project Management and Risk Control						v												

9	TPIP13	Supply Chain and Logistics Management						v												
10	TPIP15	Quality Management Systems						v												
11	TPI534	Food Service Industry								v	v	v								
Professionalism																				
1	MKS103	Pancasila and Civic Education	v	v	v	v														
2	MKS104	Basic Social and Cultural Sciences				v														
3	MKS 107	Character Building 1	v	v	v	v														
4	MKS106	Knowledge of Disasters and the Environment				v														
5	MKS 202	Character Building 2	v	v	v	v														
6	TPI201	Professional Ethics		v																
7	PEN301	Agrotechnopreneurship						v						v			v		v	
8	MKS105	Religious Education	v	v																
9	TPIP17	Professionalism and Leadership		v											v	v	v	v	v	
10	TPIP01	Internship		v	v										v	v	v	v	v	
11	TPIP02	Entrepreneurship		v	v										v	v	v	v	v	
12	TPIP03	Village Development		v	v	v									v	v	v	v	v	
13	TPIP04	Independent Project		v	v										v	v	v	v	v	
14	TPIP05	Humanitarian Project		v	v	v									v	v	v	v	v	
15	TPIP06	Teaching Assistants in Educational Institutions		v	v										v	v	v	v	v	
Quality Assurance System																				
1	TPI106	Basic Statistics					v						v							
2	TPI203	Statistical Methods						v										v		
3	TPI205	Statistical Methods Lab						v										v		

4	TPI266	Food Safety						v			v									
5	TPI268	Food Safety Lab					v				v					v				
6	TPI305	Halal Assurance System						v			v				v					
7	TPI307	Halal Assurance System Lab						v								v	v			
8	TPI369	Nutrition and Health Evaluation								v		v								
9	TPIP15	Quality Management System						v												
10	MKSP02	Community Service		v	v	v										v	v	v	v	v
Food Safety																				
1	TPI108	Microbiology					v			v	v		v							
2	TPI110	Microbiology Lab					v			v	v		v			v	v			
3	TPI261	Food Additives									v	v								
4	TPI266	Food Safety						v			v									
5	TPI268	Food Safety Lab					v				v					v				
6	TPI303	Industrial Sanitation						v			v				v					
7	TPI262	Food Processing Technology I								v										
8	TPI264	Food Processing Technology I Lab										v				v				
9	TPI534	Food Service Industry								v	v	v								
Sensory Science																				
1	TPI363	Sensory Evaluation										v								
2	TPIP09	Product Development Technology										v	v			v				
3	TPIP10	Product Development Technology Lab								v	v	v	v		v	v	v			
Biochemistry and Nutrition																				
1	TPI267	Biochemistry						v		v										
2	TPI204	Agricultural Product Analysis					v					v								
3	TPI206	Agricultural Product Analysis Lab					v					v				v	v			

4	TPI361	Functional Foods								v										
5	TPI369	Nutrition and Health Evaluation								v		v								
6	TPI542	Special Needs Foods								v							v			
7	TPI535	Food Fortification						v			v									
Systems Engineering																				
1	TPI105	Basic Mathematics											v							
2	TPI104	Calculus					v						v							
3	TPI106	Basic Statistics					v						v							
4	TPI112	Basics of Computer					v									v				
5	TPI203	Statistical Methods						v										v		
6	TPI205	Statistical Methods Lab						v										v		
7	TPI281	Introduction to Operations Research						v						v						
8	TPI283	Basic Computer Programming					v							v		v	v			
9	TPI282	System Modeling and Simulation							v						v					
10	TPI286	Operations Research and Decision Analysis							v					v	v					
11	TPI521	Life Cycle Assessment													v					
12	TPI540	Artificial Intelligence											v	v						
Industrial Management																				
1	PEN301	Agrotechnopreneurship						v							v			v		v
2	PEN302	Agrotechnopreneurship Lab						v								v	v	v	v	v
3	TPI207	Occupational Health and Safety									v				v			v		
4	TPI285	Work Procedures and Techniques											v		v					
5	TPI383	Production Planning and Inventory Control													v					
6	TPI385	Human Resources Management												v						

7	TPIP13	Supply Chain Management and Logistics						v											
8	TPI525	Marketing Technology											v						
Information Systems and Decision-Making																			
1	TPI105	Basic Mathematics											v						
2	TPI112	Basics of Computer					v									v			
3	TPI283	Basics of Computer Programming					v							v		v	v		
4	TPI286	Operations Research and Decision Analysis							v					v	v				
5	TPI381	Management Information Systems												v					
Industrial Design																			
1	MKS104	Basic Social and Cultural Sciences				v													
2	MKS 107	Character Building 1	v	v	v	v													
3	MKS106	Disaster and Environmental Knowledge				v													
4	MKS 202	Character Building 2	v	v	v	v													
5	TPI287	Introduction to Economics					v												
6	TPI284	Engineering Economics							v				v		v				
7	TPI387	Industrial Environmental Management												v					
8	TPI389	Layout and Materials Handling											v		v				
9	TPIP08	Waste Management Technology					v	v					v						
10	TPIP11	Industrial Project Planning										v	v	v					
11	TPIP12	Industrial Project Planning Lab									v				v	v	v		

VII. STRUCTURE OF COURSES IN THE CURRICULUM OF THE STUDY PROGRAM

7.1 Structure of Courses in the Curriculum of the Study Program

Table 9. Course Structure in the Study Program Curriculum

SEMESTER	COURSE GROUP OF THE UNDERGRADUATE PROGRAM					
	COMPULSORY COURSES	ELECTIVE COURSES				
		Food Technology	Agricultural Industry Technology	Specific Course	Core	Emancipated Learning-Emancipated Campus (MBKM)
1	1. Pancasila and Civic Education 2. Basic Social and Cultural Sciences 3. English Language 4. Introduction to Agricultural Science 5. Biology 6. Basic Chemistry I 7. Basic Mathematics 8. Physics 9. Character Building I					
TOTAL	9 Courses - 20 Credits					
2	1. Indonesian Language 2. Disaster Knowledge and Environmental Studies 3. Organic Chemistry					

	4. Calculus 5. Basic Statistics 6. Microbiology 7. Microbiology Lab 8. Basics of Computer 9. Packaging Technology 10. Packaging Technology Lab 11. Basic Chemistry II 12. Character Building II					
TOTAL	12 Courses - 22 Credits					
3	1. Agrotechnopreneurship 2. Professional Ethics 3. Statistical Methods 4. Statistical Methods Lab 5. Occupational Health and Safety 6. Unit Operations I 7. Food Chemistry	1. Food Additives 2. Fermentation Technology 3. Fermentation Technology Lab 4. Biochemistry	1. Introduction to Operations Research 2. Basics of Computer Programming 3. Work Procedures and Techniques 4. Introduction to Economics	1. Animal and Aquatic Product Technology 2. Bioprocess Technology 3. Sugar Technology		
TOTAL	7 Courses - 12 Credits	4 Courses – 8 Credits	4 Courses - 9 Credits	3 Courses - 7 Credits		
4	1. Religious Education	1. Food Processing Technology I	1. System Modeling and Simulation	1. Fruit and Vegetable Technology		

	2. Agrotechnopreneurship Lab 3. Unit Operations II 4. Agricultural Product Analysis 5. Agricultural Product Analysis Lab	2. Food Processing Technology I Lab 3. Food Safety 4. Food Safety Lab	2. Engineering Economics 3. Operations Research and Decision Analysis	2. Coffee and Barista Technology 3. Dairy and Dairy Product Technology 4. Bakery Technology 5. Polymer Technology		
TOTAL	5 Courses - 11 Credits	4 Courses - 8 Credits	3 Courses - 6 Credits	5 Courses - 13 Credits		
5	1. Research Methods and Scientific Writing 2. Industrial Sanitation 3. Halal Assurance Systems 4. Halal Assurance Systems Lab 5. Food Regulations and Industry	1. Functional Foods 2. Sensory Evaluation 3. Food Processing Technology II 4. Food Processing Technology II Lab 5. Nutrition and Health Evaluation	1. Management Information Systems 2. Production Planning and Inventory Control 3. Human Resource Management 4. Industrial Environmental Management 5. Layout and Material Handling	1. Oil and Fat Technology 2. Life Cycle Assessment 3. Marketing Technology 4. Bioenergy Technology		
TOTAL	5 Courses - 8 Credits	5 Courses - 10 Credits	5 Courses - 11 Credits	4 Courses – 10 Credits		

6				1. Starch Technology 2. Food Service Industry 3. Food Nanotechnology 4. Essential Oil Technology 5. Artificial Intelligence 6. Special Needs Foods	1. Industrial Communication 2. Waste Processing Technology 3. Product Development Technology 4. Product Development Technology Lab 5. Industrial Project Planning 6. Industrial Project Planning Lab 7. Supply Chain Management and Logistics 8. Project Management and Risk Control 9. Quality Management Systems	
TOTAL				6 Courses - 14 Credits	9 Courses - 16 Credits	

7				1. Cocoa and Confectionery Technology 2. Food Fortification 3. Beverage Technology		1. Internship 2. Entrepreneurship 3. Village Development 4. Independent Projects 5. Humanitarian Projects 6. Teaching Assistant at Educational Institutions
TOTAL				3 Courses - 7 Credits		1 Courses - 20 Credits
8		1. Community Service 2. Field Practice 3. Professionalism and Leadership 4. Research Proposal Seminar 5. Research Results Seminar 6. Final Project/ Thesis				
TOTAL		6 Courses - 13 Credits				

7.2 Curriculum of the Agricultural Product Technology Study Program

Table 10. List of compulsory competency courses for the Agricultural Product Technology Study Program each semester.

SEMESTER I / Odd				
No.	**Course Code**	**Course**	**Total Credit (K - P)**	**Course Category**
1	MKS 103	Pancasila and Civic Education	2 (2-0)	C
2	MKS 104	Basic Social and Cultural Sciences	2 (2-0)	C
3	MKS 107	Character Building I	0 (0-0)	C
4	MKS 201	English Language	2 (2-0)	C
5	PEN 101	Introduction to Agricultural Sciences	2 (2-0)	C
6	TPI 101	Biology	3 (2-1)	C
7	TPI 103	Basic Chemistry I	3 (2-1)	C
8	TPI 105	Basic Mathematics	3 (2-1)	C
9	TPI 107	Physics	3 (2-1)	C
		TOTAL	20	

SEMESTER II / Even				
No.	**Course Code**	**Course**	**Total Credit (K - P)**	**Course Category**
1	MKS 101	Indonesian Language	2 (2-0)	C
2	MKS 106	Disaster and Environmental Knowledge	2 (2-0)	C
3	MKS 202	Character Building II	0 (0-0)	C
4	TPI 102	Organic Chemistry	3 (2-1)	C
5	TPI 104	Calculus	3 (2-1)	C
6	TPI 106	Basic Statistics	2 (2-0)	C
7	TPI 108	Microbiology	2 (2-0)	C
8	TPI 110	Microbiology Lab	1 (0-1)	C

9	TPI 112	Basics of Computer	1 (0-1)	C
10	TPI 114	Packaging Technology	2 (2-0)	C
11	TPI 116	Packaging Technology Lab	1 (0-1)	C
12	TPI 118	Basic Chemistry II	3 (2-1)	C
		TOTAL	22	

SEMESTER III / Odd				
No.	**Course Code**	**Course**	**Total Credit (K - P)**	**Course Category**
1	PEN 201	Agrotechnopreneurship	2 (2-0)	C
2	TPI 201	Professional Ethics	1 (1-0)	C
3	TPI 203	Statistical Methods	2 (2-0)	C
4	TPI 205	Statistical Methods Lab	1 (0-1)	C
5	TPI 207	Occupational Health and Safety	2 (1-1)	C
6	TPI 209	Unit Operations I	2 (2-0)	C
7	TPI 211	Food Chemistry	2 (2-0)	C
8		Elective Courses in Food Technology Concentration	8 (6-2)	E
9		Elective Courses in Agricultural Industry Technology Concentration	9 (7-2)	E
10		Elective Courses in Specific Skills		E
		TOTAL	20 - 21	

SEMESTER IV / Even				
No.	**Course Code**	**Course**	**Total Credit (K - P)**	**Course Category**
1	MKS 105	Religious Education	2 (2-0)	C
2	PEN 200	Agrotechnopreneurship Lab	2 (0-2)	C
3	TPI 202	Unit Operations II	3 (3-0)	C

4	TPI 204	Agricultural Product Analysis	2 (2-0)	C
5	TPI 206	Agricultural Product Analysis Lab	2 (0-2)	C
6		Elective Courses in Food Technology Concentration	9 (4-5)	E
7		Elective Courses in Agricultural Industry Technology Concentration	6 (6-0)	E
8		Elective Courses in Specific Skills		E
		TOTAL	17 - 20	

SEMESTER V / Odd				
No.	**Course Code**	**Course**	**Total Credit (K - P)**	**Course Category**
1	TPI 301	Research Methods and Scientific Writing	2 (2-0)	C
2	TPI 303	Industrial Sanitation	2 (2-0)	C
3	TPI 305	Halal Assurance System	2 (2-0)	C
4	TPI 307	Halal Assurance System Lab	1 (0-1)	C
5	TPI 309	Food Regulations and Industry	1 (1-0)	C
6		Elective Courses in Food Technology Concentration	9 (8-1)	E
7		Elective Courses in Agricultural Industry Technology Concentration	11 (10-1)	E
8		Elective Courses in Specific Skills		E
		TOTAL	17 -19	

SEMESTER VI / Even				
No.	**Course Code**	**Course**	**Total Credit (K - P)**	**Course Category**
1		Core Elective Courses	16 (13-3)	E
2		Elective Courses in Emancipated Learning	20 (0-20)	E
3		Elective Courses in Specific Skills		E
		TOTAL	16 - 20	

SEMESTER VII / Odd				
No.	**Course Code**	**Course**	**Total Credit (K - P)**	**Course Category**
1		Core Elective Courses	16 (13-3)	E
2		Elective Courses in Emancipated Learning	20 (0-20)	E
3		Elective Courses in Specific Skills		E
		TOTAL	16 - 20	

SEMESTER VIII / Even				
No.	**Course Code**	**Course**	**Total Credit (K - P)**	**Course Category**
1	MKS P02	Community Service	2	C
2	TPI P16	Field Practice	2	C
3	TPI P17	Professionalism and Leadership	1	C
4	TPI P18	Research Proposal Seminar	1	C
4	TPI P19	Research Results Seminar	1	C
5	TPI P20	Final Project/Thesis	6	C
		TOTAL	13	

TOTAL CREDITS	**148**	

Explanation:

C = Compulsory Course

E = Elective Course

Table 11. List of Elective Courses in the Agricultural Products Technology Study Program

No.	Course Code	Elective Courses	Total Credit (K - P)	Course Category
SEMESTER III / Odd				
1	TPI 261	Food Additives	2 (2-0)	FT
2	TPI 263	Fermentation Technology	2 (2-0)	FT
3	TPI 265	Fermentation Technology Lab	1 (0-1)	FT
4	TPI 267	Biochemistry	3 (2-1)	FT
5	TPI 281	Introduction to Operations Research	2 (2-0)	AIT
6	TPI 283	Basics of Computer Programming	3 (1-2)	AIT
7	TPI 285	Work Procedures and Techniques	2 (2-0)	AIT
8	TPI 287	Introduction to Economics	2 (2-0)	AIT
9	TPI 513	Animal and Aquatic Product Processing Technology	2 (2-0)	SS
10	TPI 527	Bioprocess Technology	3 (2-1)	SS
11	TPI 529	Sugar Technology	2 (2-0)	SS
SEMESTER IV / Even				
1	TPI 262	Food Processing Technology I	2 (2-0)	FT
2	TPI 264	Food Processing Technology I Lab	2 (0-2)	FT
3	TPI 266	Food Safety	2 (2-0)	FT
4	TPI 268	Food Safety Lab	2 (0-2)	FT
5	TPI 282	System Modeling and Simulation	2 (2-0)	AIT
6	TPI 284	Engineering Economics	2 (2-0)	AIT
7	TPI 286	Operations Research and Decision Analysis	2 (2-0)	AIT
8	TPI 514	Fruit and Vegetable Technology	2 (2-0)	SS
9	TPI 520	Coffee and Barista Technology	3 (2-1)	SS
10	TPI 524	Dairy and Dairy Product Technology	3 (2-1)	SS
11	TPI 526	Bakery Technology	3 (2-1)	SS
12	TPI 530	Polymer Technology	2 (2-0)	SS

SEMESTER V / Odd				
1	TPI 361	Functional Foods	2 (2-0)	FT
2	TPI 363	Sensory Evaluation	3 (2-1)	FT
3	TPI 365	Food Processing Technology II	2 (2-0)	FT
4	TPI 367	Food Processing Technology II Lab	1 (0-1)	FT
5	TPI 369	Nutrition and Health Evaluation	2 (2-0)	FT
6	TPI 381	Management Information Systems	3 (2-1)	AIT
7	TPI 383	Production Planning and Inventory Control	2 (2-0)	AIT
8	TPI 385	Human Resource Management	2 (2-0)	AIT
9	TPI 387	Industrial Environmental Management	2 (2-0)	AIT
10	TPI 389	Layout and Material Handling	2 (2-0)	AIT
11	TPI 515	Oil and Fat Technology	3 (2-1)	SS
12	TPI 521	Life Cycle Assessment	3 (2-1)	SS
13	TPI 525	Marketing Technology	2 (2-0)	SS
14	TPI 531	Bioenergy Technology	2 (2-0)	SS
SEMESTER VI / Even dan VII / Odd				
1	TPI P01	Internship	20 (0-20)	MB
2	TPI P02	Entrepreneurship	20 (0-20)	MB
3	TPI P03	Village Development	20 (0-20)	MB
4	TPI P04	Independent Projects	20 (0-20)	MB
5	TPI P05	Humanitarian Projects	20 (0-20)	MB
6	TPI P06	Teaching Assistants in Educational Institutions	20 (0-20)	MB
7	TPI P07	Industrial Communication	2 (1-1)	Core
8	TPI P08	Waste Processing Technology	2 (2-0)	Core
9	TPI P09	Product Development Technology	2 (2-0)	Core
10	TPI P10	Product Development Technology Lab	1 (0-1)	Core
11	TPI P11	Industrial Project Planning	2 (2-0)	Core
12	TPI P12	Industrial Project Planning Lab	1 (0-1)	Core

13	TPI P13	Supply Chain Management and Logistics	2 (2-0)	Core
14	TPI P14	Project Management and Risk Control	2 (2-0)	Core
15	TPI P15	Quality Management System	2 (2-0)	Core
16	TPI 532	Starch Technology	3 (2-1)	SS
17	TPI 534	Foodservice Industry	2 (2-0)	SS
18	TPI 536	Food Nanotechnology	2 (2-0)	SS
19	TPI 538	Essential Oil Technology	3 (2-1)	SS
20	TPI 540	Artificial Intelligence	2 (2-0)	SS
21	TPI 542	Special Needs Foods	2 (2-0)	SS
16	TPI 533	Cocoa and Confectionery Technology	3 (2-1)	SS
17	TPI 535	Food Fortification	2 (2-0)	SS
18	TPI 537	Beverage Technology	2 (2-0)	SS

Explanation of Course Categories:

FT = Elective Courses in Food Technology Concentration

AIT = Elective Courses in Agricultural Industry Technology Concentration

Core = Core Elective Course

MB = Elective Courses in Emancipated Learning Program (MBKM)

SS = Elective Course in Specific Skills

7.3 Curriculum Map

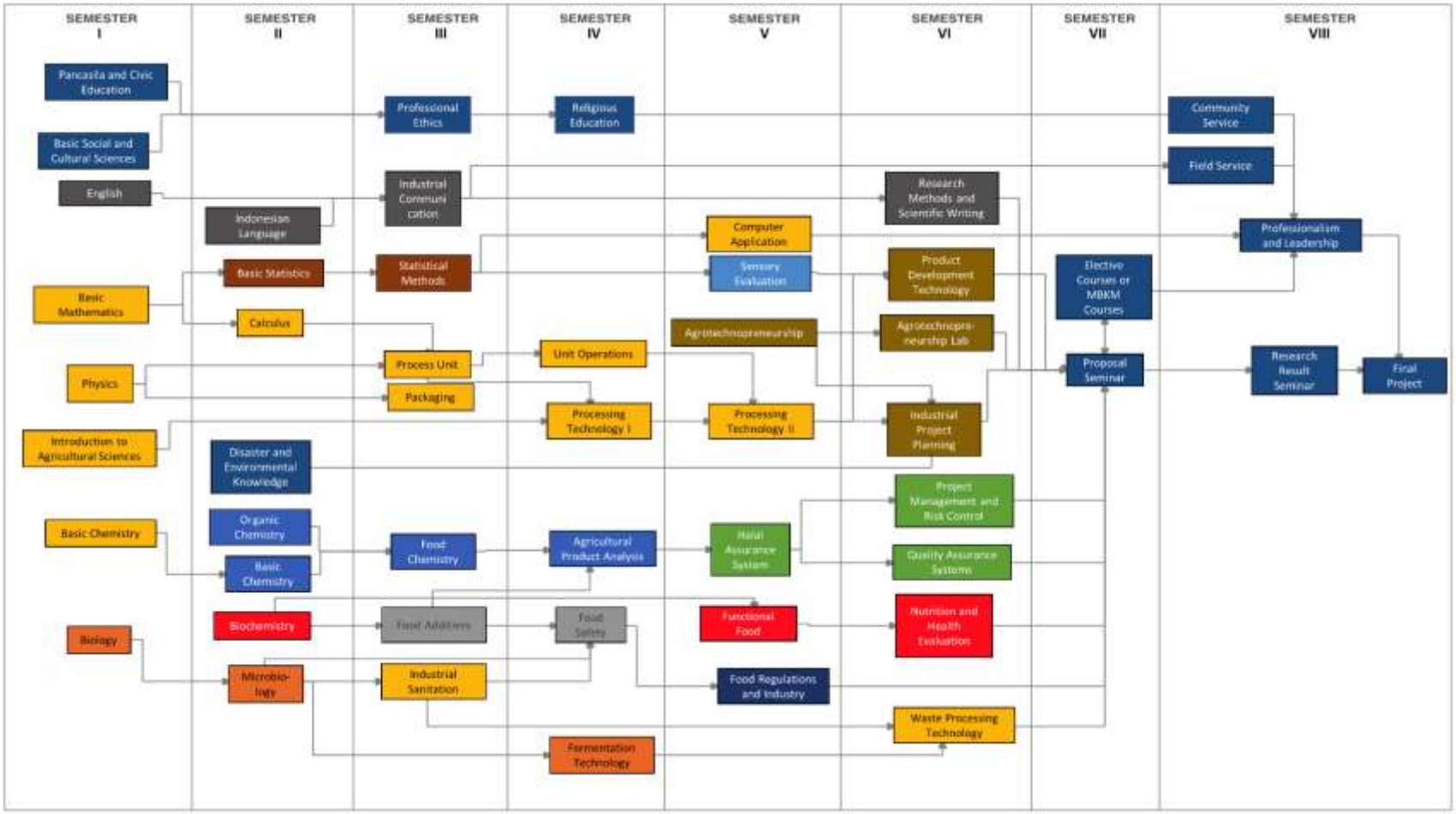

Figure 1. Curriculum Map for the Food Technology Concentration

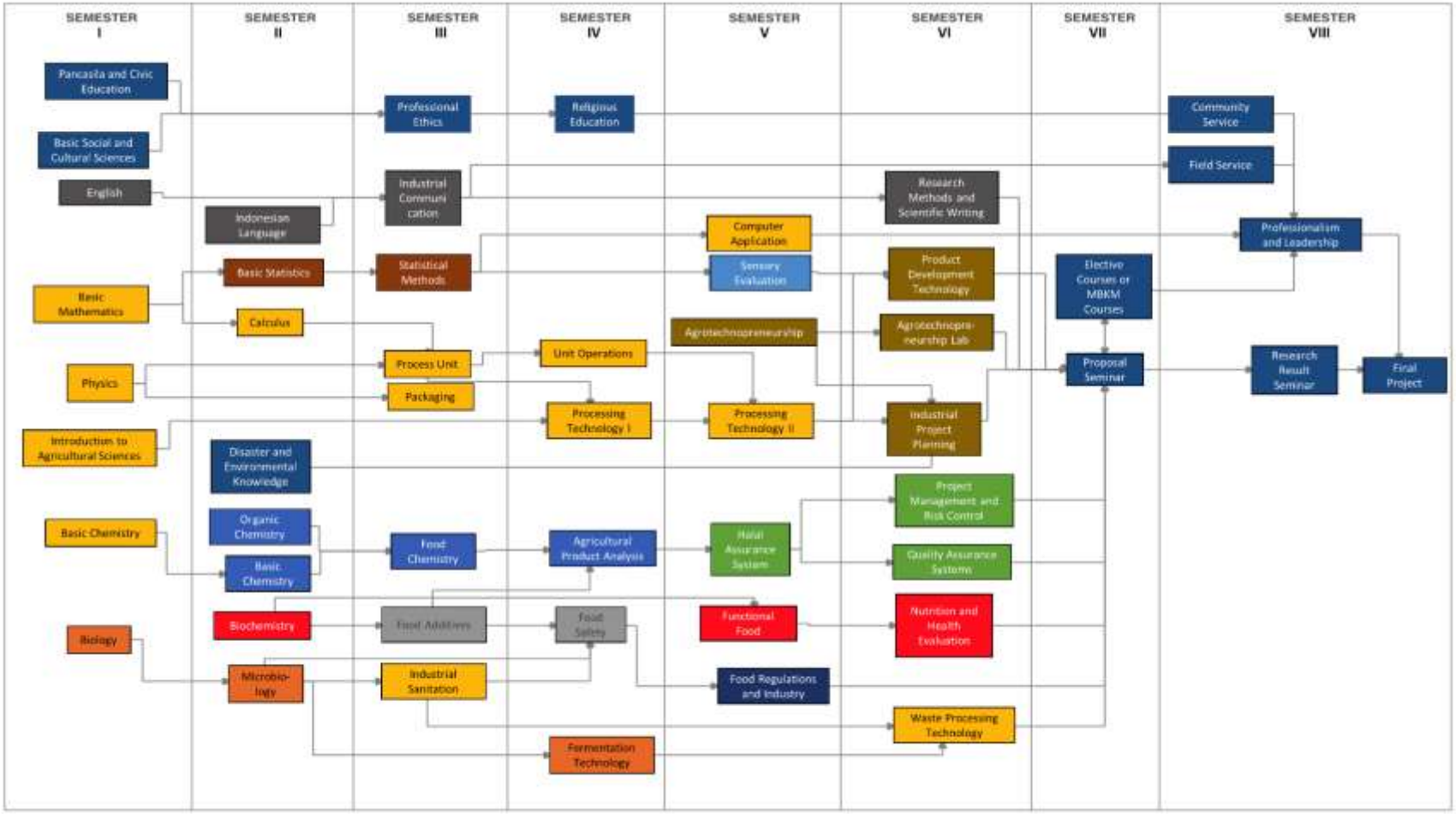

Figure 2. Curriculum Map for the Agricultural Industry Technology Concentration

7.4 Matrix of the Relationship between GLO and Curriculum

Table 12. Matrix of the relationship between GLO and the Curriculum of the Agricultural Product Technology Study Program

No	Course Code	Course Title	Attitude and Behaviours (S)				Mastery in Sciences (P)			Special Skills (SS)						General Skills (GS)				
										Food Technology			Agricultural Industry Technology							
			1	2	3	4	1	2	3	1	2	3	1	2	3	1	2	3	4	5
SEMESTER 1																				
1	MKS103	Pancasila and Civic Education	v	v	v	v														
2	MKS104	Basic Social and Cultural Sciences				v														
3	MKS201	English															v		v	
4	PEN101	Introduction to Agricultural Science											v							
5	TPI101	Biology											v							
6	TPI103	Basic Chemistry I											v							
7	TPI105	Basic Mathematics											v							
8	TPI107	Physics																		
9	MKS 107	Character Building I	v	v	v	v														
SEMESTER 2																				
1	MKS101	Indonesian Language																	v	
2	MKS106	Knowledge of Disasters and the Environment				v														
3	TPI102	Organic Chemistry					v						v							
4	TPI104	Calculus					v						v							
5	TPI106	Basic Statistics					v						v							
6	TPI108	Microbiology					v			v	v		v							

7	TPI110	Microbiology Lab					v			v	v		v			v	v			
8	TPI112	Basics of Computer					v									v				
9	TPI114	Packaging Technology									v				v					
10	TPI116	Packaging Technology Lab									v				v	v				
11	TPI118	Basic Chemistry II					v			v	v		v							
12	MKS 202	Character Building II	v	v	v	v														
SEMESTER 3																				
1	PEN301	Agrotechnopreneurship						v							v			v		v
2	TPI201	Professional Ethics		v																
3	TPI203	Statistical Methods						v										v		
4	TPI205	Statistical Methods Lab						v										v		
5	TPI207	Occupational Health and Safety									v				v			v		
6	TPI209	Operational Units I									v		v							
7	TPI211	Food Chemistry						v		v										
8	TPI261	Food Additives									v	v								
9	TPI263	Fermentation Technology								v	v									
10	TPI265	Fermentation Technology Lab									v					v	v			
11	TPI267	Biochemistry						v		v										
12	TPI281	Introduction to Operations Research						v						v						
13	TPI283	Basics of Computer Programming					v							v		v	v			
14	TPI285	Work Procedures and Techniques											v		v					
15	TPI287	Introduction to Economics					v													
16	TPI513	Animal and Aquatic Product Technology								v			v		v					
17	TPI527	Bioprocess Technology								v			v		v					
18	TPI529	Sugar Technology								v			v		v					

SEMESTER 4																				
1	MKS105	Religious Education	v	v																
2	PEN302	Agrotechnopreneurship Lab						v								v	v	v	v	v
3	TPI202	Operational Units II									v		v							
4	TPI204	Agricultural Product Analysis					v					v								
5	TPI206	Agricultural Product Analysis Lab					v					v				v	v			
6	TPI262	Food Processing Technology I								v										
7	TPI264	Food Processing Technology I Lab										v				v				
8	TPI266	Food Safety						v			v									
9	TPI268	Food Safety Lab					v				v					v				
10	TPI282	Industrial Economics							v						v					
11	TPI284	Engineering Economics							v				v		v					
12	TPI286	Operations Research and Decision Analysis							v					v	v					
13	TPI514	Fruit and Vegetable Technology								v					v					
14	TPI520	Coffee and Barista Technology								v					v					
15	TPI524	Dairy and Dairy Products Technology								v					v					
16	TPI526	Bakery Technology								v										
17	TPI530	Polymer Technology								v										
SEMESTER 5																				
1	TPI301	Research Methods and Scientific Writing							v									v	v	
2	TPI303	Industrial Sanitation						v			v				v					
3	TPI305	Halal Assurance System						v			v				v					
4	TPI307	Halal Assurance System Lab						v								v	v			
5	TPI309	Food Regulations and Industry						v			v				v					
6	TPI361	Functional Foods								v										

7	TPI363	Sensory Evaluation										v								
8	TPI365	Food Processing Technology II								v										
9	TPI367	Food Processing Technology II Lab								v							v	v		
10	TPI369	Nutrition and Health Evaluation								v		v								
11	TPI381	Management Information Systems												v						
12	TPI383	Production Planning and Inventory Control													v					
13	TPI385	Human Resource Management												v						
14	TPI387	Industrial Environmental Management												v						
15	TPI389	Layout and Material Handling											v		v					
16	TPI515	Oil and Fat Technology								v										
17	TPI521	Life Cycle Assessment													v					
18	TPI525	Marketing Technology											v							
19	TPI531	Bioenergy Technology								v										
SEMESTER 6 AND SEMESTER 7																				
1	TPI532	Starch Technology								v										
2	TPI534	Food Service Industry								v	v	v								
3	TPI536	Food Nanotechnology						v												
4	TPI538	Essential Oil Technology						v												
5	TPI540	Artificial Intelligence											v	v						
6	TPI542	Special Needs Foods								v								v		
7	TPIP01	Internship		v	v												v	v	v	v	v
8	TPIP02	Entrepreneurship		v	v												v	v	v	v	v
9	TPIP03	Village Development		v	v	v											v	v	v	v	v

10	TPIP04	Independent Projects		v	v											v	v	v	v	v
11	TPIP05	Humanitarian Projects		v	v	v										v	v	v	v	v
12	TPIP06	Teaching Assistantship in Educational Institutions		v	v											v	v	v	v	v
13	TPIP07	Industrial Communication																	v	
14	TPIP08	Waste Processing Technology					v	v					v							
15	TPIP09	Product Development Technology										v	v			v				
16	TPIP10	Product Development Technology Lab								v	v	v	v		v	v	v			
17	TPIP11	Industrial Project Planning										v	v	v						
18	TPIP12	Industrial Project Planning Lab									v				v	v	v			
19	TPIP13	Supply Chain and Logistics Management						v												
20	TPIP14	Project Management and Risk Control						v												
21	TPIP15	Quality Management Systems						v												
1	TPI533	Cocoa and Confectionery Technology								v					v					
2	TPI535	Food Fortification						v			v									
3	TPI537	Beverage Technology						v		v	v									
SEMESTER 8																				
1	MKSP02	Community Service		v	v	v										v	v	v	v	v
2	TPIP16	Field Practice		v												v	v	v	v	v
3	TPIP17	Professionalism and Leadership		v												v	v	v	v	v
4	TPIP18	Research Proposal Seminar														v	v		v	
5	TPIP19	Research Results Seminar														v	v		v	
6	TPIP20	Final Project/Thesis			v											v	v	v	v	

VIII. LIST OF COURSE DISTRIBUTION AND SKS (CREDITS) TO ECTS CONVERSION PER SEMESTER

Table 13. List of course distribution and SKS/Credit to ECTS conversion per semester

No	Course Title	Course Code	Course Category	Weight (Credit)	Lecture Weight (Credit)	Practice Weight (Credit)	Course Weight (ECTS)
Semester 1							
1	Pancasila and Civic Education	MKS 103	C	2 (2-0)	2		3.2
2	Basic Social and Cultural Sciences	MKS 104	C	2 (2-0)	2		3.2
3	English	MKS 201	C	2 (2-0)	2		3.2
4	Introduction to Agricultural Science	PEN 101	C	2 (2-0)	2		3.2
5	Biology	TPI 101	C	3 (2-1)	2	1	4.8
6	Basic Chemistry I	TPI 103	C	3 (2-1)	2	1	4.8
7	Basic Mathematics	TPI 105	C	3 (2-1)	2	1	4.8
8	Physics	TPI 107	C	3 (2-1)	2	1	4.8
9	Character Building I	MKS 107	C	0 (0-0)			
Semester 2							
1	Indonesian Language	MKS 101	C	2 (2-0)	2		3.2
2	Knowledge of Disasters and the Environment	MKS 106	C	2 (2-0)	2		3.2
3	Organic Chemistry	TPI 102	C	3 (2-1)	2	1	4.8
4	Calculus	TPI 104	C	3 (2-1)	2	1	4.8
5	Basic Statistics	TPI 106	C	2 (2-0)	2		3.2
6	Microbiology	TPI 108	C	2 (2-0)	2		3.2
7	Microbiology Lab	TPI 110	C	1 (0-1)		1	1.6
8	Basics of Computer	TPI 112	C	1 (0-1)		1	1.6
9	Packaging Technology	TPI 114	C	2 (2-0)	2		3.2
10	Packaging Technology Lab	TPI 116	C	1 (0-1)		1	1.6

11	Basic Chemistry II	TPI 118	C	3 (2-1)	2	1	4.8
12	Character Building II	MKS 202	C	0 (0-0)			
Semester 3							
1	Agrotechnopreneurship	PEN 301	C	2 (2-0)	2		3.2
2	Professional Ethics	TPI 201	C	1 (1-0)	1		1.6
3	Statistical Methods	TPI 203	C	2 (2-0)	2		3.2
4	Statistical Methods Lab	TPI 205	C	1 (0-1)		1	1.6
5	Occupational Health and Safety	TPI 207	C	2 (1-1)	1	1	3.2
6	Unit Operations I	TPI 209	C	2 (2-0)	2		3.2
7	Food Chemistry	TPI 211	C	2 (2-0)	2		3.2
8	Food Additives	TPI 261	FT	2 (2-0)	2		3.2
9	Fermentation Technology	TPI 263	FT	2 (2-0)	2		3.2
10	Fermentation Technology Lab	TPI 265	FT	1 (0-1)		1	1.6
11	Biochemistry	TPI 267	FT	3 (2-1)	2	1	4.8
12	Introduction to Operations Research	TPI 281	AIT	2 (2-0)	2		3.2
13	Basics of Computer Programming	TPI 283	AIT	3 (1-2)	1	2	4.8
14	Work Procedures and Techniques	TPI 285	AIT	2 (2-0)	2		3.2
15	Introduction to Economics	TPI 287	AIT	2 (2-0)	2		3.2
16	Animal and Aquatic Product Technology	TPI 513	SS	2 (2-0)	2		3.2
17	Bioprocess Technology	TPI 527	SS	3 (2-1)	2	1	4.8
18	Sugar Technology	TPI 529	SS	2 (2-0)	2		3.2
Semester 4							
1	Religious Education	MKS 105	C	2 (2-0)	2		3.2
2	Agrotechnopreneurship Lab	PEN 200	C	2 (0-2)		2	3.2
3	Unit Operations II	TPI 202	C	3 (3-0)	3		4.8
4	Agricultural Product Analysis	TPI 204	C	2 (2-0)	2		3.2
5	Agricultural Product Analysis Lab	TPI 206	C	2 (0-2)		2	3.2
6	Food Processing Technology I	TPI 262	FT	2 (2-0)	2		3.2

7	Food Processing Technology I Lab	TPI 264	FT	2 (0-2)		2	3.2
8	Food Safety	TPI 266	FT	2 (2-0)	2		3.2
9	Food Safety Lab	TPI 268	FT	2 (0-2)		2	3.2
10	Modeling and Simulation of Systems	TPI 282	AIT	2 (2-0)	2		3.2
11	Engineering Economics	TPI 284	AIT	2 (2-0)	2		3.2
12	Operations Research and Decision Analysis	TPI 286	AIT	2 (2-0)	2		3.2
13	Fruit and Vegetable Technology	TPI 514	SS	2 (2-0)	2		3.2
14	Coffee and Barista Technology	TPI 520	SS	3 (2-1)	2	1	4.8
15	Dairy and Dairy Product Technology	TPI 524	SS	3 (2-1)	2	1	4.8
16	Bakery Technology	TPI 526	SS	3 (2-1)	2	1	4.8
17	Polymer Technology	TPI 530	SS	2 (2-0)	2		3.2
Semester 5							
1	Research Methods and Scientific Writing	TPI 301	C	2 (2-0)	2		3.2
2	Industrial Sanitation	TPI 303	C	2 (2-0)	2		3.2
3	Halal Assurance System	TPI 305	C	2 (2-0)	2		3.2
4	Halal Assurance System Lab	TPI 307	C	1 (0-1)		1	1.6
5	Food Regulations and Industry	TPI 309	C	1 (1-0)	1		1.6
6	Functional Foods	TPI 361	FT	2 (2-0)	2		3.2
7	Sensory Evaluation	TPI 363	FT	3 (2-1)	2	1	4.8
8	Food Processing Technology II	TPI 365	FT	2 (2-0)	2		3.2
9	Food Processing Technology II Lab	TPI 367	FT	1 (0-1)		1	1.6
10	Nutrition and Health Evaluation	TPI 369	FT	2 (2-0)	2		3.2
11	Management Information Systems	TPI 381	AIT	3 (2-1)	2	1	4.8
12	Production Planning and Inventory Control	TPI 383	AIT	2 (2-0)	2		3.2

13	Human Resource Management	TPI 385	AIT	2 (2-0)	2		3.2
14	Industrial Environmental Management	TPI 387	AIT	2 (2-0)	2		3.2
15	Layout and Material Handling	TPI 389	AIT	2 (2-0)	2		3.2
16	Oil and Fat Technology	TPI 515	SS	3 (2-1)	2	1	4.8
17	Life Cycle Assessment	TPI 521	SS	3 (2-1)	2	1	4.8
18	Marketing Technology	TPI525	SS	2 (2-0)	2		3.2
19	Bioenergy Technology	TPI 531	SS	2 (2-0)	2		3.2
Semester 6							
1	Industrial Communication	TPI P07	Core	2 (1-1)	1	1	3.2
2	Waste Processing Technology	TPI P08	Core	2 (2-0)	2		3.2
3	Product Development Technology	TPI P09	Core	2 (2-0)	2		3.2
4	Product Development Technology Lab	TPI P10	Core	1 (0-1)		1	1.6
5	Industrial Project Planning	TPI P11	Core	2 (2-0)	2		3.2
6	Industrial Project Planning Lab	TPI P12	Core	1 (0-1)		1	1.6
7	Supply Chain Management and Logistics	TPI P13	Core	2 (2-0)	2		3.2
8	Project Management and Risk Control	TPI P14	Core	2 (2-0)	2		3.2
9	Quality Management System	TPI P15	Core	2 (2-0)	2		3.2
10	Starch Technology	TPI 532	SS	3 (2-1)	2	1	4.8
11	Food Service Industry	TPI 534	SS	2 (2-0)	2		3.2
12	Food Nanotechnology	TPI 538	SS	2 (2-0)	2		3.2
13	Essential Oil Technology	TPI 540	SS	3 (2-1)	2	1	4.8
14	Artificial Intelligence	TPI 542	SS	2 (2-0)	2		3.2
15	Special Needs Foods	TPI 544	SS	2 (2-0)	2		3.2
Semester 7							
1	Internship	TPI P01	MB	20 (0-20)		20	32
2	Entrepreneurship	TPI P02	MB	20 (0-20)		20	32
3	Village Development	TPI P03	MB	20 (0-20)		20	32

4	Independent Projects	TPI P04	MB	20 (0-20)		20	32
5	Humanitarian Projects	TPI P05	MB	20 (0-20)		20	32
6	Teaching Assistants in Educational Institutions	TPI P06	MB	20 (0-20)		20	32
7	Cocoa and Confectionery Technology	TPI 533	SS	3 (2-1)	2	1	4.8
8	Food Fortification	TPI 535	SS	2 (2-0)	2		3.2
9	Beverage Technology	TPI 537	SS	2 (2-0)	2		3.2
Semester 8							
1	Community Service	MKS P02	C	2		2	3.2
2	Field Practice	TPI P16	C	2		2	3.2
3	Professionalism and Leadership	TPI P17	C	1		1	1.6
4	Research Proposal Seminar	TPI P18	C	1		1	1.6
5	Research Results Seminar	TPI P19	C	1		1	1.6
6	Final Project/Thesis	TPI P20	C	6		6	9.6

C = Compulsory Courses
FT = Elective Courses in the Food Technology Concentration
AIT = Elective Courses in the Agricultural Industry Technology Concentration
Core = Core Elective Courses
MB = Elective Courses in Emancipated Learning (MBKM)
SS = Elective Courses in Specific Skills

Project Based Method Course	
Case Method Course	

IX. IMPLEMENTATION OF MAXIMUM 3 SEMESTER STUDENT LEARNING RIGHTS

9.1 Implementation Model (MBKM)

The courses offered in the sixth or seventh semester are the same: the Core Elective courses or one of the Independent Learning Program elective courses. Students are allowed to choose one of these packages in the sixth or seventh semester. When taking Independent Learning Program courses, students must fill out the Course Registration Form (KRS) and find a place to carry out their activities through the Independent Learning Program coordinator or the relevant Ministry. Students will be assigned an academic advisor to assist, monitor, and evaluate their activities. The academic advisor will conduct the evaluation process of the study's success in a structured manner. Independent Learning Program activities have a credit load of 20 credit hours, which are completed over 5-6 months, including:

1. Internship in the Industry

   Conducting an internship or practical work in the industry related to the competencies of the APT study program for 5-6 months, with a credit load of 20 credit hours.
2. Teaching Assistance at Educational Institutions

   Teaching at the level of vocational high schools in the fields of food technology, agricultural technology, fisheries, or animal husbandry.
3. Humanitarian Projects

   Participating in humanitarian projects in a region affected by disasters, in remote, outermost, and underdeveloped areas, and working according to their competencies.
4. Entrepreneurship Activities

   Developing their own business in a field related to the competencies of the APT study program, aiming to create a startup that can be continued after completing their studies in the APT program. Students will be guided in developing a business plan, seeking startup capital, and running their business.
5. Independent Study or Project

   Conducting an independent project to realize ideas, concepts, or works aimed at participating in national or international competitions to solve community issues, such as

reforestation, stunting prevention, nutrition improvement in a community or location, or others.

6. Village Development/Thematic Community Service

   The USK Community Service Agency manages the Village Development or Thematic Community Service program. The program lasts for six months, equivalent to 20 credit hours. In the Thematic Community Service program, students and other students will be placed in a village. It is expected that students from various fields of knowledge, working in groups, can innovatively and creatively solve the problems faced by the community.

9.2 Compulsory Courses in the Study Program

Compulsory courses are grouped based on national, university, faculty, and study program compulsory courses, as listed in Table 14.

Table 14. Course Groups

Course Group	Total Credits	Course
National Compulsory Courses	6 (4.1%)	Pancasila and Citizenship Education, Religious Education, and Indonesian Language
University Compulsory Courses	8 (5.5 %)	Basic Social and Cultural Sciences, English Language, Disaster and Environmental Knowledge, and Community Service Program
Faculty Compulsory Courses	6 (4.1 %)	Agrotechnopreneurship and Agrotechnopreneurship Lab, Introduction to Agricultural Science
Inter Study Program Compulsory Courses	0	-
Study Program Compulsory Courses	108 (73.0%)	Food Processing and Analysis Technology, Quality Control, and Production Management
Elective Courses	26 (17.6 %)	Food and Industry
Total	148 (100%)	

9.3 Learning Outside the Study Program

Students from the third to seventh semester are allowed to participate in a student exchange program for one semester, with a credit load of 20-24 SKS, in the Food Science and Technology, Agricultural Technology, Agricultural Industrial Technology, or other recognized programs at universities or institutions, both domestically and internationally, by the Agricultural Product Technology (APT) study program at USK. Courses taken at the host university will be converted into equivalent courses in the APT study program at USK with similar learning outcomes. The credit conversion process will be determined later by the APT study program after coordination with the host program.

9.4 Forms of Off-Campus Learning

Recognition is the acknowledgment of student learning activities conducted outside the campus and equating them with credit hours in the study program curriculum. Activities that can be recognized must meet the curriculum requirements and be programmed in the student's KRS (Course Registration Form). The purpose of recognition is to acknowledge learning activities outside the campus that are equivalent to regular course credit hours, subject to the following conditions:

1. Activities that have been agreed upon with the partner institution and documented by MoU/SPK (Memorandum of Understanding/Agreement);
2. Activities that are part of a structured curriculum program approved by the university and have been ratified by the USK Rector;
3. Activities that are supervised by appointed faculty advisors and have written recognition from the partner institution;
4. Activities that provide authentic evidence of off-campus learning, including the completion of a report form as per the Technical Instructions, which must be signed by an official/partner supervisor and supported by online attendance records;
5. Activities that can be equated with elective courses;
6. If the activity involves attending classes or conducting research at another university, that university and program must have at least the same or higher accreditation level;
7. Activities in line with Regulation of the Minister of Education and Culture No. 3 of 2020, in accordance with the MBKM Program;

8. A maximum of 40 credits may be recognized, with a maximum of 20 credits per semester, including off-campus activities such as community service, internships, and others;
9. In the case of community development activities, only activities falling under the Holistic Village Development and Empowerment Program (PHP2D) scope will be recognized. This includes (a) poverty alleviation, (b) health, (c) education, (d) food security and safety, (e) renewable energy, (f) environment and biodiversity, (g) disaster mitigation, (h) culture and the arts, (i) creative industries, (j) tourism, and (k) manufacturing.

9.5 Quality Assurance of MBKM Implementation

The implementation of Merdeka Belajar, Kampus Merdeka (MBKM – Emancipated Learning, Emancipated Campus) is ensured through monitoring to ensure that the objectives and planned activities are carried out on schedule. Monitoring is conducted by faculty advisors in collaboration with field advisors. MBKM students must complete progress reports describing achievements, target realization, obstacles, and future plans. In addition to monitoring, students must maintain a daily logbook or logbook to document their MBKM activities.

X. CONCLUSION

The Agricultural Product Technology (APT) Study Program curriculum for 2021 to 2025 is based on the Indonesian National Qualification Framework (KKNI). It has been developed through an extensive process that considers input from stakeholders and professional associations in the field of science. The APT study program graduates are expected to achieve the program's learning objectives once they have completed the course-specific learning objectives. This curriculum also considers the rapid advancements in science and technology and the dynamics of the industry, especially with the advent of Industry 4.0 and the transition to Industry 5.0. Through this APT study program curriculum, it is hoped that graduates will be well-prepared to meet their future employers' academic performance, ethics, and professionalism expectations.

Appendix 1. Decree on the Assessment Rubric, Template, and Portfolio

KEMENTERIAN PENDIDIKAN, KEBUDAYAAN, RISET DAN TEKNOLOGI
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KEPUTUSAN
DEKAN FAKULTAS PERTANIAN UNIVERSITAS SYIAH KUALA
NOMOR: 839/UN11.5/2023

Tentang

PENETAPAN PENGGUNAAN RUBRIK PENILAIAN, RPS DAN PORTOFOLIO
BERBASIS OBE SEMESTER GENAP 2022/2023
FAKULTAS PERTANIAN UNIVERSITAS SYIAH KUALA

DEKAN FAKULTAS PERTANIAN UNIVERSITAS SYIAH KUALA

Membaca : Membaca Surat Ketua Satuan Jaminan Mutu Fakultas, Fakultas Pertanian Universitas Syiah Kuala Nomor B/131/UN11.1.5/JM.00/2023 tanggal 20 Januari 2023 tentang permohonan Surat Keputusan Dekan.

Menimbang :
a. Bahwa untuk menunjang penyelenggaraan kegiatan akademik sesuai dengan perkembangan ilmu dan teknologi, maka dipandang perlu untuk membentuk Penggunaan Rubrik Penilaian, RPS dan Portofolio Berbasis OBE semester genap 2022/2023 pada Fakultas Pertanian Universitas Syiah Kuala;
b. Bahwa untuk keperluan tersebut, perlu ditetapkan dengan Keputusan Dekan.

Mengingat :
1. Undang-undang Republik Indonesia Nomor 20 Tahun 2003 Tentang Sistem Pendidikan Nasional;
2. Undang-undang Republik Indonesia Nomor 12 Tahun 2012 tentang Pendidikan Tinggi;
3. Undang – undang Republik Indonesia Nomor 5 Tahun 2014 Tentang Aparatur Sipil Negara;
4. Peraturan Pemerintah Republik Indonesia Nomor 4 Tahun 2014 Tentang Penyelenggaraan Pendidikan Tinggi dan Pengelolaan Perguruan Tinggi;
5. Peraturan Pemerintah Republik Indonesia Nomor 38 Tahun 2022 Tentang Perguruan Tinggi Negeri Berbadan Hukum Universitas Syiah Kuala;
6. Keputusan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi R.I Nomor 11837/MPK.A/KP.07.00/2022 tentang Pengangkatan Rektor Universitas Syiah Kuala Periode 2022-2026;
7. Surat Keputusan Dekan Fakultas Pertanian Universitas Syiah Kuala Nomor 2231/UN11/KPT/2019 tanggal 16 Desember 2019.

M E M U T U S K A N

Menetapkan : KEPUTUSAN DEKAN FAKULTAS PERTANIAN UNIVERSITAS SYIAH KUALA TENTANG PENETAPAN PENGGUNAAN RUBRIK PENILAIAN, RPS DAN PORTOFOLIO BERBASIS OBE SEMESTER GENAP 2022/2023 (https://bit.ly/PortofolioFPUSK) PADA FAKULTAS PERTANIAN UNIVERSITAS SYIAH KUALA

PERTAMA : Menetapkan Surat Keputusan Dekan Penggunaan Rubrik Penilaian, RPS dan Portofolio Berbasis OBE semester genap 2022/2023 pada Fakultas Pertanian Universitas Syiah Kuala.

KEDUA : Keputusan ini terhitung mulai semester genap 2022/2023, dengan ketentuan bahwa segala sesuatunya akan diubah dan diperbaiki sebagaimana mestinya, jika dalam penetapan ini dikemudian hari ternyata terdapat kekeliruan.

Ditetapkan di : Darussalam, Banda Aceh
Pada tanggal : 13 Februari 2023

DEKAN FAKULTAS PERTANIAN USK

Prof. Dr. Ir. Samadi, M.Sc.
NIP. 196807171993031005

Tembusan :
1. Rektor Universitas Syiah Kuala di Darussalam;
2. Ketua Jurusan di lingkungan FP Unsyiah;
3. Ketua Prodi DIII di lingkungan FP Unsyiah;
4. Arsip.

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DECREE
DEAN OF THE FACULTY OF AGRICULTURE, UNIVERSITAS SYIAH KUALA
NUMBER: 839/UN11.5/2023

Regarding

THE DETERMINATION OF THE USE OF ASSESSMENT RUBRICS, SLP, AND PORTFOLIO BASED ON OBE FOR THE EVEN SEMESTER OF 2022/2023 FACULTY OF AGRICULTURE, UNIVERSITAS SYIAH KUALA

DEAN OF THE FACULTY OF AGRICULTURE, UNIVERSITAS SYIAH KUALA

Having read : The Letter from the Chairman of the Quality Assurance Unit of the Faculty, Faculty of Agriculture, Universitas Syiah Kuala, Number B/131/UN11.1.5/JM.00/2023 dated January 20, 2023, regarding the request for the Dean's Decree.

Considering :

a. That to support the implementation of academic activities in accordance with the developments in science and technology, it is deemed necessary to establish the Use of Assessment Rubrics, RPS, and Portfolios Based on OBE for the even semester of 2022/2023 at the Faculty of Agriculture, Universitas Syiah Kuala;

b. That for these purposes, it is necessary to be determined by the Dean's Decree.

In view of :

1. Law of the Republic of Indonesia Number 20 of 2003 concerning the National Education System;
2. Law of the Republic of Indonesia Number 12 of 2012 concerning Higher Education;
3. Law of the Republic of Indonesia Number 5 of 2014 concerning the State Civil Apparatus;
4. Government Regulation of the Republic of Indonesia Number 4 of 2014 concerning Higher Education and the Management of Higher Education;
5. Government Regulation of the Republic of Indonesia Number 38 of 2022 concerning State Universities with Legal Entity Status Universitas Syiah Kuala;
6. Decision of the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia Number 11837/MPK A/KP.07.00/2022 concerning the Appointment of the Rector of Universitas Syiah Kuala for the 2022-2026 Period;
7. Decree of the Dean of the Faculty of Agriculture, Universitas Syiah Kuala Number 2231 /UN.11/KPT/2019 dated December 16, 2019.

DECIDES

To Enact : THE DECISION OF THE DEAN OF THE FACULTY OF AGRICULTURE, SYIAH KUALA UNIVERSITY, REGARDING THE DETERMINATION OF THE USE OF ASSESSMENT RUBRICS, SLP, AND PORTFOLIO BASED ON OBE FOR THE EVEN SEMESTER OF 2022/2023 (https://bit.ly/PortololioFPUSK) AT THE FACULTY OF AGRICULTURE, UNIVERSITAS SYIAH KUALA.

FIRST : Determined the Dean's Decree regarding the Use of Assessment Rubrics, SLP, and Portfolios Based on OBE for the even semester of 2022/2023 at the Faculty of Agriculture, Universitas Syiah Kuala.

SECOND : This decision takes effect starting from the even semester of 2022/2023, with the provision that everything will be amended and improved as necessary if any errors are found in this decision in the future.

Stipulated in : Darussalam. Banda Aceh
On the Date of : February 13, 2023

DEAN OF THE FACULTY OF AGRICULTURE
OF UNIVERSITAS SYIAH KUALA

Signed and Stamped

Prof. Dr. Ir. Samadi, M.Sc.
Official Reg. No. 196807171993031005

Carbon Copy Notation:
1. The Rector of Syiah Kuala University in Darussalam;
2. The Heads of the Departments within the Faculty of Agriculture, Syiah Kuala University;
3. The Head of the DIII Study Program within the Faculty of Agriculture, Syiah Kuala University;
4. Archives.

SEMESTER LEARNING PLAN AND TEACHING MATERIALS

COURSE

PRODUCT DEVELOPMENT TECHNOLOGY LAB

Course Code: TPI P10- Semester VII (SKS 1:0-1)

UNDERGRADUATE PROGRAM IN AGRICULTURAL PRODUCT TECHNOLOGY
Faculty of Agriculture - Universitas Syiah Kuala
2022

VALIDATION SHEET

Course Title	PRODUCT DEVELOPMENT TECHNOLOGY LAB
Course Code	TPI P10
Semester/Credit	VII / 1 (0-1)
Coordinator of Lecturers	Dian Hasni, S.TP., M.Sc.
Members	Dr. Ir. M. Ikhsan Sulaiman, S.TP., M.Sc. IPU Cut Nilda, S.TP., M.Sc Yulia Annisa, S.TP. M.Si., M.AppIn&E

Darussalam, June 15, 2022

Head of the Agricultural Product Technology Department

(Dr. Ir. Mhd. Ikhsan Sulaiman, S.TP., M.Sc. IPU)

Course Coordinator,

(Dian Hasni, S.TP., M.Sc.)

Justification of Conformity of Graduate Profile, Program Learning Outcomes, with Course Learning Outcomes (GP x GLO x CLO)

Course: PRODUCT DEVELOPMENT LAB
Undergraduate Study Program of Agricultural Product Technology - Universitas Syiah Kuala
Course Code: TPI P10, Semester VII, 1 (0-1)

Program Learning Outcome (PLO)		Course LO		Sub Course LO	Graduate Profile
Study Program LO (PLO)		Course Learning Outcomes (CLO)		Sub Course Learning Outcomes	Graduate Profile (GL)
GLO-A2	Have morals and ethics in carrying out duties professionally.	**CLO 1**	Able to develop new ideas and products that are acceptable to the market in accordance with current conditions, issues, and social, community, and environmental developments.	Listed in the Semester Learning Plan table for 16-course sessions	1) Production Manager 2) Assistant Manager 3) Production Supervisor
GLO-A3	Innovative and creative in working, both independently and in teams, to solve problems and challenges with lifelong learning				
GLO-K2	Master the knowledge of management, engineering, communication, and entrepreneurship to produce safe, halal, and value-added products.	**CLO 2**	Able to apply the concepts of management, process engineering, and entrepreneurship in the stages of developing food products.		
GLO-K3	Master scientific principles in solving agricultural technology problems	**CLO 3**	Able to identify issues and solve them scientifically in the process of product development.		

GLO-SSFT1	Able to process agricultural products based on biochemical and food nutrition concepts	**CLO 4**	Able to explain the sources and variability of raw materials used and the impact of processing on the resulting products' biochemical changes and nutritional content.		
GLO-SSFT2	Able to design and implement food safety systems in the processing of agricultural products.	**CLO 5**	Able to find legal sources and regulations related to the main/ raw materials/ supporting/ packaging labels for the developed products.		
GLO-SSFT3	Able to develop and test the quality of agricultural products in a measurable manner	**CLO 6**	Able to evaluate and improve the sensory quality of developed products using appropriate sensory testing methods.		1) Production Manager 2) Assistant Manager 3) Production Supervisor
GLO-SSAIT1	Master the concepts of economics, systems engineering, and industrial design in agricultural product processing.	**CLO 7**	Able to develop standards and specifications for products, processes, and economic value calculations for new product ideas that are developed.		
GLO-GS1	Able to apply logical, critical, systematic, and innovative thinking in the context of developing or implementing knowledge and technology.	**CLO 8**	Able to design, implement, and evaluate product development plans logically and systematically.		
GLO-GS3	Capable of communicating effectively, both orally and in writing.	**CLO 9**	Able to deliver oral presentations and prepare relevant technical documents for food product development.		

Description: A= Attitude, K = Knowledge, SS = Specific Skills, GS = General Skills

The Conformity matrix of CLO x GLO and GP of the Technology Product Development Course

CLO	GLO																		GRADUATE PROFILE
	ATTITUDE				KNOWLEDGE			SPECIFIC SKILLS						GENERAL SKILLS					
								FOOD TECHNOLOGY			AGRICULTURAL INDUSTRY TECHNOLOGY								
	1	2	3	4	1	2	3	1	2	3	1	2	3	1	2	3	4	5	1) Production Manager 2) Assistant Manager 3) Production Supervisor
1		v	v																
2		v	v			v													
3		v	v				v												
4								v											
5									v										
6										v									
7		v									v								
8		v	v				v							v					
9		v														v			

SEMESTER LEARNING PLAN (SLP)
UNDERGRADUATE PROGRAM IN AGRICULTURAL PRODUCT TECHNOLOGY
UNIVERSITAS SYIAH KUALA

SEMESTER LEARNING PLAN

Course Title	Course Code	Course Group	Weight (Credit)	Semester	Preparation Date (Rev. No.)
FOOD SAFETY	TPIP09	CORE	1 (0-1)	7	June 15, 2022 (4)

Undergraduate Program in Agricultural Product Technology	Name of Curriculum / SLP Developer	Course Coordinator	Head of Study Program
	DIAN HASNI, S.TP., M.Sc	DIAN HASNI, S.TP., M.SC	Dr. Ir. Mhd. Ikhsan Sulaiman, S.TP., M.Sc. IPU.

Course Short Description	This course covers the process of developing innovative and creative new products, including goods, services, or management. The discussion includes analyzing market potential and gaps, brand strength, market strength, stages of new product development, product placement analysis, market research, product design, and consumer acceptance analysis. The learning methods combine theory, case study discussions, and discussions with practitioners.
Subject Matter/ Main Topics	Listed in the Semester Learning Plan table for 16-course sessions:

References	**Main:** Earle and Earle. 2009. Food Product Development. CRC Press Fuller, G.W. 2011 New Food Product Development: From Concept to Market Place. CRC Press Moskowitz HR, Saguy IS, Straus T. 2009. An Integrated Approach to New Food Product Development. CRC Press. Naganachi, M and Lokman A.M. 2015. Kansei Innovation-Practical Design Applications for Product and Service Development. CRC Press Irianto, H.E. dan Giyatmi. 2021. Pengembangan produk Pangan-Teori dan Implementasi,Rajawali Press, Depok **Supporting:** Teaching Materials for the Product Development Technology Course	
Learning Media	**Software:**	**Hardware:**
	Microsoft Office (MS PowerPoint and Word), E-learning, YouTube, Zoom Meetings, Google Drive, Kahoot, WhatsApp, Canva, and MyMindMeister	Notebook, LCD projector, whiteboard, markers, and instructional materials (developed by students during practical exercises).
Name of Lecturers	Dr. Ir. M. Ikhsan Sulaiman, S.TP., M.Sc. IPU Dian Hasni, S.TP., M.Sc Cut Nilda, S.TP., M.Sc Yulia Annisa, S.TP. M.Si., M.AppIn&E	
Prerequisite Courses	-	

Week	Sub-CLO (Expected Learning Outcomes:)	Subject Matter (Learning Materials)	Learning Forms and Methods	Estimated Duration	Student Learning Experience	Assessment Methods	Assessment Indicators	Assessment Weight (%)
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**	**(9)**
Upon completing this course, students will be able to:								
1, 2	Developing ideas, selecting emerging ideas, and presenting them as initial stages of product development	- Brainstorming - Technical Feasibility Analysis - SWOT Analysis	Approach: Bottom-up Methodology: Discovery Model: PBL	4 x 170	Literature review, teamwork, task completion, discussions	Participative engagement, Responsiveness, Logbook, maintenance, report writing	Cognitive, Affective, & Psychomotor	3.75% 2.5% 3.125%

3,4,5	Analyzing trends, consumer needs, market potential studies, and competitor mapping for the selected idea by distributing questionnaires.	Designing the questionnaire should employ the Kansei method and competitor mapping analysis.	Approach: Bottom-up, Process Skills Methodology: Discovery Model: PBL	6 x 170	Literature review, teamwork, task completion, discussions	Participative engagement, Responsiveness, Logbook, maintenance, report writing	Cognitive, Affective, & Psychomotor	3.75% 2.5% 3.125%
6	Designing and testing the feasibility of the created product concept	Product concept design, product concept testing.	Approach: Bottom-up, Process Skills Methodology: Discovery Model: PBL	4 x 170	Literature review, teamwork, task completion, discussions	Participative engagement, Responsiveness, Logbook, maintenance, report writing	Cognitive, Affective, & Psychomotor	3.75% 2.5% 3.125%
7,8,9	Planning detailed product specifications (product quality targets, raw materials, processes, and process indicators) and identifying marketing strategies for the developed product	- Determining Product Design & Specifications - Design Feasibility Analysis using FMEA	Approach: Bottom-up, Process Skills Methodology: Discovery, literature review, discussions Model: PBL	6 x 170	Literature review, teamwork, task completion, discussions	Participative engagement, Responsiveness, Logbook, maintenance, report writing	Cognitive, Affective, & Psychomotor	3.75% 2.5% 3.125%
10,11, 12	Testing and evaluating the designed product and its specifications. Measuring consumer	- Product formulation (raw materials, process technology, packaging technology, shelf life identification).	Approach: Process skills. Methods: In-lab test, presentation. Model: PBL	6 x 170	Literature review, teamwork, task completion, discussions	Participative engagement, Responsiveness, Logbook, maintenance, report writing	Cognitive, Affective, & Psychomotor	3.75% 2.5% 3.125%

	acceptance of the product using sensory tests and providing improvement recommendations.	- Sensory testing method.						
13,14, 15	Measuring the product's marketability scale and making product improvements after commercialization.	Product commercialization (processing the product for sale, store testing, or exhibition)	Approach: Process skills Methods: Exhibition, in-store test, presentation Model: PBL	6x 170	Literature review, teamwork, task completion, discussions	Participative engagement, Responsiveness, Logbook, maintenance, report writing	Cognitive, Affective, & Psychomotor	3.75% 2.5% 3.125%
16	END-OF-SEMESTER EXAM (Final Presentation)							25%
							TOTAL	**100%**

COURSE ASSESSMENT
RUBRIC

ASSESSMENT CATEGORIES	Benchmark Competency Assessment for Moderate Level A ≥ 87 78 ≤ AB< 87 69 ≤ B< 78 60 ≤ BC< 69 51 ≤ C< 60 41 ≤ D< 51 E < 41
ASSESSMENT INDICATORS AND WEIGHTS	Participatory Activities (Attitude): 5% Project Results (Chapter-wise reports, logbook, and work performance): 50% Cognitive/Knowledge: Responsiveness: 5% Midterm Exam (Presentation): 15% Final Exam (Final Report): 25%

ASSESSMENT CRITERIA: ATTITUDE

No.	Criteria	Good	Very Good	Excellent	Weight	Score	Total (weight x score)
		69-77	78-86	87-100			
1	Attendance*	The student was absent from learning activities for a total of 2 meetings	The student was absent from learning activities for a total of 1 meeting	The student attended every learning activity	20		

2	Active Participation in the Learning Process	The student lacks curiosity, rarely responds or asks questions, and is not task-oriented	The student has a high level of curiosity, frequently asks questions or responds to questions asked, task-oriented	The student has an extremely high level of curiosity, always asks questions or responds to questions asked, and is highly task-oriented	40		
3	Timeliness in Submitting Assignments	The student does not consistently submit assignments and does not adhere to the specified deadlines	The student consistently submits assignments but does not adhere to the specified deadlines	The student consistently submits assignments on time as per the specified deadlines	20		
4	Honesty (plagiarism)	Similarity up to 45%	Similarity up to 40%	Similarity up to 30%	20		
TOTAL					**100**		
Note: * Students with attendance of less than 12 meetings (75%) cannot take the final semester exam.							

ASSESSMENT CRITERIA: WORK ASSESSMENT

No	Assessment Criteria	Assessment Categories					Weight	Score	Total (Weight x Score)
		Very Poor (0-20)	Poor (21-40)	Fair (41-60)	Good (61-80)	Very Good (81-100)			
1	Discipline	Did not attend the practical session	Attended the practical session but arrived very late (>30 minutes from the schedule), disrupting the smooth running of the practical	Attended the practical session but arrived late (>15 minutes from the schedule)	Attended the practical session, did not participate in the quiz, but arrived slightly late (<15 minutes from the schedule)	Attended the practical session diligently and arrived on time	15%		

2	Collaboration	Did not collaborate with group members or complete group tasks during the practical session.	Had limited ability to collaborate and communicate with group members, did not participate in completing group tasks during the practical session	Adequately collaborated and communicated with group members but only partially contributed to group tasks during the practical session	Effectively collaborated and communicated with group members, completed group tasks during the practical session with guidance from other group members	Collaborated excellently with group members, actively participated during the practical session, and helped lead the group's work effectively	25%		
3	Ability to Follow Instructions	The student is unable to follow the work procedures in each practical session even after being given instructions	The student has limited ability to follow the work procedures in each practical session even after being given instructions	The student is able to follow the work procedures in each practical session reasonably well with guidance	The student is able to follow the work procedures in each practical session well with guidance	The student is able to independently and effectively follow the work procedures in each practical session	30%		
4	Technical Skills According to the Practical Title	Student is unable to use laboratory equipment	Student has limited ability to use laboratory equipment	Student is reasonably capable of using laboratory equipment	Student is proficient in using laboratory equipment	Student is highly proficient in using laboratory equipment	30%		

ASSESSMENT CRITERIA: PRACTICUM REPORT

No	Assessment Criteria	Assessment Categories					Weight	Score	Total (Weight x Score)
		Very Poor (0-20)	Poor (21-40)	Fair (41-60)	Good (61-80)	Very Good (81-100)			
1	Organization and systematics of the Report (Complete and Sequential Report: Cover, Acknowledgments, Table of Contents, Introduction, Literature Review, Methods, Results and discussion, Conclusion, References, and Appendices)	The report is incomplete, not systematic (content is not in the right place), and highly disorganized.	The report is somewhat complete (missing 4 components), somewhat systematic (the content is unsuitable), and somewhat organized.	The report is reasonably complete (missing 2 components), systematic, and well-organized.	The report is complete, systematic, and well-organized.	The report is complete, highly systematic, and extremely well-organized.	5%		
2	Writing Style (Writing Style/Use of Capitalization/Italicization, Spelling, Punctuation, Misstyping) and Use of Standard Indonesian (Sentence Structure)	The writing style is very poor due to numerous errors in report writing. The report does not use proper and standard Indonesian.	The writing style is not good because of capitalization/italicization, spelling, punctuation, and writing errors. There are instances of incorrect and non-standard Indonesian.	The writing style is fairly accurate, but there are errors in capitalization/italicization and punctuation. It uses proper and standard Indonesian.	The writing style is good, but there are errors in using italics/bold formatting. It uses proper and standard Indonesian.	The writing style is correct, and it uses proper and standard Indonesian	10%		
3	Introduction	The background is highly unrelated to the title and the learning topic and lacks supporting data	The background is somewhat related to the title and the assignment topic but lacks supporting data	The background is moderately related to the title and the assignment topic and is supported by some data	The background is well-aligned with the title and the assignment topic, supported by sufficient data	The background is highly aligned with the title and the assignment topic, strongly supported by data	20%		

4	Literature & References (Relevance, Number of References, and Publication Year) (Books or Articles)	References are fewer than 3 and not relevant to the assigned topic. Reference formatting is inconsistent	There are ≤ 3 references that are somewhat relevant to the assigned topic. Reference formatting is inconsistent	There are fewer than 5 references, and they are moderately relevant to the assigned topic. Reference formatting is consistent	There are 5 references, and they are relevant to the assigned topic. Reference formatting is consistent	More than 5 references are used. The references used are highly relevant to the assigned topic, and reference formatting is consistent	20%		
5	Results and Discussion	The data analysis results and discussion are not appropriate	The data analysis results are somewhat accurate. The discussion is not very relevant to the issues outlined in Chapter I and is not supported by relevant references. It lacks graphical information	The data analysis results are reasonably accurate. The discussion is relevant to the issues outlined in Chapter I. The discussion is supported by relevant references but lacks graphical information	The data analysis results are accurate. The discussion is highly relevant to the issues outlined in Chapter I. The discussion is supported by relevant references but lacks graphical information.	The data analysis results are very accurate. The discussion is highly relevant to the issues outlined in Chapter I. The discussion is supported by relevant references and includes graphical information (images/diagrams /photos).	25%		
6	Conclusion	The conclusion does not align with the objectives and data obtained	The conclusion is somewhat aligned with the objectives and data obtained. The conclusion deviates	The conclusion is reasonably aligned with the objectives and data obtained	The conclusion is aligned with the objectives and data obtained	The conclusion is highly aligned with the objectives and data obtained	10%		
7	Plagiarism for similarity > 3%	Similarity up to 60%	Similarity up to 50%	Similarity up to 45%	Similarity up to 40%	Similarity up to 30%	10%		
TOTAL							**100%**		

ASSESSMENT CRITERIA: PRESENTATION

No.	Assessment Criteria	Very Poor	Poor	Fair	Good	Very Good	Weight	Score	Total (Weight x Score)
		<=20	21-40	41-60	61-80	81-100			
Presentation Content									
1	Alignment with Format	Not appropriate	Somewhat appropriate	Moderately appropriate	Appropriate	Highly appropriate	15%		
2	Slide design	The poster design is unattractive and lacks creativity	The poster design is somewhat unattractive and lacks creativity	The poster design is moderately attractive and creative	Poster design is attractive and creative	Poster design is highly attractive and creative	20%		
3	Poster Content	The poster content is not informative and up-to-date	The poster content is somewhat informative and up-to-date	Poster content is moderately informative and up-to-date	Poster content is informative and up-to-date	Poster content is highly informative and up-to-date	25%		
4	Sentence Structure	Long and unclear sentences are used	Short, concise, and somewhat unclear sentences are used	Short, concise, and moderately clear sentences are used	Short, concise, and clear sentences are used	Short, concise, and highly clear sentences are used	10%		
Presentation Method									
5	Quality of Material Delivery	The material is delivered unclearly, using non-standard language and inappropriate body language and eye contact.	The material is delivered somewhat unclearly, using non-standard language and inappropriate body language and eye contact.	The material is delivered moderately clearly, using standard language but with inappropriate body language and eye contact.	The material is delivered clearly, using standard language and appropriate body language and eye contact.	The material is delivered very clearly, using a standard language, and appropriate body language and eye contact	15%		
6	Response to Participant Questions (Q&A)	The presenter cannot explain all questions, suggestions, and criticisms from participants, and participants seem not to understand what the presenter is conveying.	The presenter can explain most questions, suggestions, and criticisms from participants but with some difficulty, and participants seem to somewhat understand what the presenter is conveying.	The presenter can explain most questions, suggestions, and criticisms from participants reasonably well, and participants seem to fairly understand what the presenter is conveying.	The presenter can explain all questions, suggestions, and criticisms from participants effectively, and participants seem to understand what the presenter is conveying.	The presenter can explain all questions, suggestions, and criticisms from participants very effectively, and participants seem to highly understand what the presenter is conveying.	15%		
TOTAL							100%		

STUDENT PROJECT PLAN SHEET
(PROJECT-BASED LEARNING)

ASSIGNMENT FORM

Presentation Slides and Report

ASSIGNMENT TITLE

Assignment 1 : Developing and Selecting Ideas
Assignment 2 : Analyzing Product Trends, Consumer Needs, and Competitor Mapping
Assignment 3 : Creating a Product Concept
Assignment 4 : Designing Product and Process Specifications
Assignment 6 : Testing Product Formulation
Assignment 7 : Commercialization of the Product
Assignment 8 : Final Presentation

SUB COURSE LEARNING OUTCOMES

In accordance with the Sub Course Learning Outcomes for each meeting.

ASSIGNMENT DESCRIPTION

Students carry out product development practices for each topic sequentially according to the provided procedures. Students collect data from practical work per group and class. Students interpret the data in written/report form.

ASSIGNMENT EXECUTION METHOD AND SCHEDULE

1. Independently (based on group data and/or class data)
2. Presentation slides and reports are submitted to the assistant.

OUTPUT FORM AND FORMAT

a. Work Object: Data and practical results

b. Presentation Slide Output Provisions

1. Slides are created using MS PowerPoint/Canva in landscape orientation.
2. The cover slide consists of the assignment title.
3. Slide content includes data from the activities and proposed conclusions.

c. Output Provisions for Reports:

1. Reports are created in Word format, font TNR 12, with 1.5 spacing.
2. The report's cover page consists of the assignment title, student name and ID, program name, and USK logo.
3. The report includes background, literature review, methodology, results and discussion, and conclusions.
4. The end of the report includes a bibliography (minimum of 5 references from the last 5 years with at least 3 article citations).

SEMESTER LEARNING PLAN AND TEACHING MATERIALS

COURSE

FERMENTATION TECHNOLOGY

Course Code: TPI263- Semester III (SKS 2:2-0)

UNDERGRADUATE PROGRAM IN AGRICULTURAL PRODUCT TECHNOLOGY
Faculty of Agriculture-Universitas Syiah Kuala
2022

VALIDATION SHEET

Course Title	FERMENTATION TECHNOLOGY
Course Code	TPI263
Semester/SKS	III / 2 (2-0)
Coordinator of Lecturers	Dr. Dewi Yunita, S.TP., M.Res.
Members	Dr. Murna Muzaifa, S.TP., M.P. Ir. Syarifah Rohaya, M.P. Eva Murlida, S.TP., M.Sc.

Darussalam, August 19, 2022

Head of the Agricultural Product Technology Department

(Dr. Ir. Mhd. Ikhsan Sulaiman, S.TP., M.Sc. IPU)

Course Coordinator

(Dr. Dewi Yunita, S.TP., M.Res.)

Justification of Conformity of Graduate Profile, Program Learning Outcomes, with Course Learning Outcomes (GP x GLO x CLO)

Course: FERMENTATION TECHNOLOGY
Undergraduate Study Program of Agricultural Product Technology - Universitas Syiah Kuala
Course Code: TPI263, Semester III, 2 (2-0)

Program Learning Outcome (PLO)		Course LO		Sub Course LO	Graduate Profile
CP-Study Program (PLO))		Course Learning Outcomes (CLO)		SUB CLO	Graduate Profile (GL)
GLO-A3	Innovative and creative in working independently and in teams to solve problems and challenges with lifelong learning.	**CLO3**	Able to address issues that arise in the dairy fermentation industry (C6, A5, P5)	Listed in the Semester Learning Plan table for 16-course sessions	1) Manager/Supervisor 2) Entrepreneur 3) Research Assistant
GLO-K3	Master scientific principles in solving agricultural technology problems	**CLO3**	Able to address issues that arise in the dairy fermentation industry (C6, A5, P5)		
GLO-GS1	Able to make informed decisions in solving problems based on science and technology of agricultural products.	**CLO3**	Able to address issues that arise in the dairy fermentation industry (C6, A5, P5)		
GLO-KKTP1	Able to process agricultural products based on biochemical and food nutrition concepts	**CLO1**	Able to mention raw material-based fermented food products and explaining their production processes (C1)		
		CLO2	Able to explain the factors and microorganisms involved in the production process (C2)		

S= Sikap, P= Pengetahuan, KK=Keterampilan Khusus, KU=Keterampilan Umum

The Conformity matrix of CLO x GLO and GP of the Fermentation Technology Course

CLO	GLO																		GRADUATE PROFILE
	ATTITUDE				KNOWLEDGE			SPECIFIC SKILLS						GENERAL SKILLS					
								FOOD TECHNOLOGY			AGRICULTURAL INDUSTRY TECHNOLOGY								
	1	2	3	4	1	2	3	1	2	3	1	2	3	1	2	3	4	5	1) Manager/ Supervisor 2) Entrepreneur 3) Research Assistant
1								√											
2								√											
3			√				√							√					

SEMESTER LEARNING PLAN (SLP)

UNDERGRADUATE PROGRAM IN AGRICULTURAL PRODUCT TECHNOLOGY

UNIVERSITAS SYIAH KUALA

SEMESTER LEARNING PLAN

Course Title	Course Code	Course Group	Weight (Credit)	Semester	Preparation Date (Rev. No.)
FERMENTATION TECHNOLOGY	TPI263	Concentration Compulsory	2 / 3,2	3	June 14, 2022 (3)

	Name of Curriculum / SLP Developer	Course Coordinator	Head of Study Program
Undergraduate Program in Agricultural Product Technology	Dr. Dewi Yunita, S.TP., M.Res. Dr. Murna Muzaifa, S.TP., M.P. Ir. Syarifah Rohaya, M.P. Eva Murlida, S.TP., M.Sc.	Dr. Dewi Yunita, S.TP., M.Res	Dr. Ir. Mhd. Ikhsan Sulaiman, S.TP., M.Sc. IPU.

Course Short Description	Providing basic knowledge about processed products whose processing involves microorganisms. The processing and development of fermented products, both traditionally and modernly, include fruit and vegetable fermentation, tubers, grains, and animal products, as well as process control and determination of the final product's quality.
Subject Matter/ Main Topics	Microbiology Product Processing Engineering Food Safety

<table>
<tr><td>References</td><td colspan="2">Main:
Farnworth, E.R. 2008. Handbook of Fermented Functional Foods. CRC Press, USA.
Riadi, L. 2013. Teknologi Fermentasi. Graha Ilmu, Yogyakarta
Rahayu, W., R. Pambayun., U. Santoso., Giyatmi dan Ardiansyah. 2017. Ensiklopedia Produk Pangan Indonesia. PT Penerbit IPB press, Bogor.

Supporting:
Guidelines for Fermentation Technology Laboratory Practice</td></tr>
<tr><td rowspan="2">Learning Media</td><td>Software:</td><td>Hardware:</td></tr>
<tr><td>Microsoft Office (PowerPoint and Word),
E-learning, YouTube, Zoom Meeting, Google Drive, Kahoot, WhatsApp</td><td>Notebook, LCD projector, whiteboard, markers, and teaching materials (commercial fermented food products)</td></tr>
<tr><td>Name of Lecturers</td><td colspan="2">Dr. Dewi Yunita, S.TP., M.Res.
Dr. Murna Muzaifa, S.TP., M.P.
Ir. Syarifah Rohaya, M.P.
Eva Murlida, S.TP., M.Sc.</td></tr>
<tr><td>Prerequisite Courses</td><td colspan="2">-</td></tr>
</table>

Week	Sub-CLO (Expected Learning Outcomes:)	Subject Matter (Learning Materials)	Learning Forms and Methods	Estimated Duration	Student Learning Experience	Assessment Methods	Assessment Indicators	Assessment Weight (%)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Upon completing this course, students will be able to:								
1	1. Understand the scope of Fermentation Technology coursework. 2. Able to explain the background and history of fermentation.	Course contract and the history of fermentation technology development.	Approach: Top-down Method: Lecture Model: Contextual instruction	2 x 50				
2-3	Able to explain the factors and microorganisms that play a role in making traditional Indonesian fermentation products.	*Belacan* *Pliek u* *Asam drien* Etc.	Approach: Bottom-up Method: Assignments and presentations Model: Small group discussion	4 x 50	The students conduct a literature review.	Summary/ Article Review	Cognitive/ Knowledge: Assignment	15%
4	Able to explain the factors and microorganisms that play a role in making nata.	Nata	Approach: Top-down Method: Discussion and lecture Model: Small group discussion	2 x 50	The students read the course materials uploaded on e-learning and participate in quizzes through Kahoot.	Quiz	Cognitive/ Knowledge	1,25%
5-7	Able to explain the factors and	Yogurt Curd	**Pendekatan**: Bottom-Up	6 x 50	The students attend guest	Attitude, Discussion,	Participatory Activities	50%

	microorganisms involved in the process of making fermented dairy products	Kefir Buttermilk Ayran Cheese	**Metode**: Case Method **Model**: Small group discussion		lectures taught by Practitioners (Mrs. Candra Rahmani Priyambada from Yahuud Yoghurt and Mr. Awe Fatkhurrochman from Mazaraat Cheese) Group assignment based on case studies provided by the Practitioners. The students conduct simple laboratory tests and create posters. The students present their work results in the form of posters and engage in discussions. The students receive feedback from professors and practitioners.	Presentation, and Poster		
8	Capable of explaining the factors and microorganisms	Sausage Ham	Approach: Bottom-up Method:	2 x 50	The students submit poster revisions.	Quiz	Cognitive/ Knowledge	1,25%

	involved in the process of making fermented meat products.		Discussion and lecture Model: Discovery learning		The students attend a guest lecture from The University of Glasgow, UK (Dr. Rodrigo Nova) The students participate in quizzes using Menti.			
9-10	Able to explain the factors and microorganisms involved in the process of making fermented cereal products.	Tempeh Soy Sauce	Approach: Top-down Method: Assignment Model: Cooperative learning	4 x 50	The students conduct literature reviews.			
11	Able to explain the factors and microorganisms involved in the process of making fermented tuber products.	Fermented Cassava/Rice	Approach: Bottom-up Method: Discussion and lecture Model: Discovery learning	2 x 50	The students read course materials uploaded on e-learning and participate in quizzes through Kahoot.	Quiz	Cognitive/ Knowledge	1,25%
12	Able to explain the factors and microorganisms involved in the process of making fermented fish and	Shrimp Paste Petis Katsuobushi	Approach: Bottom-up Method: Discussion and lecture Model:	2 x 50				

	aquatic products.		Discovery learning					
	Midterm Exam						Written Test	15%
13-14	Capable of explaining the factors and microorganisms involved in the process of making fermented vegetable products.	Pickel Saurkraut Kimchi	Approach: Top-down Method: Assignment Model: Discovery learning	4 x 50	The students read course materials uploaded on e-learning.			
15	Capable of explaining the factors and microorganisms involved in the process of making fermented fruit products.	Vinegar	Approach: Bottom-up Method: Discussion and lecture Model: Discovery learning	2 x 50	The students use Kahoot.	Quiz	Cognitive/ Knowledge	1,25%
16	Capable of explaining the factors and microorganisms involved in the process of making fermented tea products.	Kombucha	Approach: Top-down Method: Discussion and lecture Model: Discovery learning	2 x 50				
	Final Exam						Written Test	15%
							TOTAL	**100%**

COURSE ASSESSMENT
RUBRIC

ASSESSMENT CATEGORIES	Benchmark Competency Assessment for Moderate Level A ≥ 87 78 ≤ AB< 87 69 ≤ B< 78 60 ≤ BC< 69 51 ≤ C< 60 41 ≤ D< 51 E < 41
ASSESSMENT INDICATORS AND WEIGHTS (According to IKU 7)	Participatory Activities (Attitude, Discussion, Presentation, and Poster): 30% Project Results: 20 Cognitive/Knowledge: Assignments (Article Summary/Review): 15% Quizzes: 5% Midterm Exam: 15% Final Exam: 15%

ASSESSMENT CRITERIA: ATTITUDE

No.	Criteria	Good	Very Good	Excellent	Weight	Score	Total (weight x score)
		69-77	78-86	87-100			
1	Attendance*	Student was absent from learning activities for a total of 2 meetings	Student was absent from learning activities for a total of 1 meeting	Student attended every learning activity	20		

2	Active Participation in the Learning Process	Student lacks curiosity, rarely responds or asks questions, and is not task-oriented	The student has a high level of curiosity, frequently asks questions or responds to questions asked, task-oriented	The student has an extremely high level of curiosity, always asks questions or responds to questions asked, and is highly task-oriented	40		
3	Timeliness in Submitting Assignments	The student does not consistently submit assignments and does not adhere to the specified deadlines	Student consistently submits assignments but does not adhere to the specified deadlines	Student consistently submits assignments on time as per the specified deadlines	20		
4	Honesty (plagiarism)	Similarity up to 45%	Similarity up to 40%	Similarity up to 30%	20		
TOTAL					**100**		
Note: * Students with attendance of less than 12 meetings (75%) cannot take the final semester exam.							

ASSESSMENT CRITERIA: DISCUSSION

No	**Assessment Criteria**	**Score and Criteria**					**Weight**	**Score**	**Total (weight x score)**
		Very Poor (20)	**Poor (40)**	**Fair (60)**	**Good (80)**	**Very Good (100)**			
1	Active in expressing opinions	Never asks or answers	Asks and/or provides an answer once	Asks and/or provides an answer twice	Asks and/or provides an answer three times	Asks and/or provides an answer four times or more	35%		

2	Attitude in expressing opinions	Unclear description with non-standard Indonesian language and lack of structure	Unclear description with non-standard Indonesian language and insufficient structure	Unclear description with non-standard Indonesian language and insufficient structure	Clear description with standard Indonesian language and insufficient structure	Clear description in standard Indonesian language and structure	15%		
3	Coverage of material in the question	Ask questions, but the questions are not relevant to the material	Ask questions, but the questions are somewhat relevant to the material	Ask questions, and the questions are relevant to the material	Ask questions, and the questions are relevant to the material and connected with recent developments	The questions are relevant to the material, aligned with recent developments, and provided with relevant examples.	20%		
4	Answer to the question	Answer the questions, but the answers are not correct	Answer the questions, but the answers are unclear and somewhat incorrect	Answers the questions clearly and correctly.	Answers the questions correctly and systematically.	Answers the questions correctly, systematically, and based on analysis.	30%		
TOTAL							**100%**		

ASSESSMENT CRITERIA: PRESENTATION AND POSTER

No.	**Assessment Criteria**	**Very Poor**	**Poor**	**Fair**	**Good**	**Very Good**	**Weight (%)**	**Score**	**Total (Weight x Score)**
		<=20	**21-40**	**41-60**	**61-80**	**81-100**			
Presentation Poster Material									
1	Alignment with Format	Not appropriate	Somewhat appropriate	Moderately appropriate	Appropriate	Highly appropriate	15%		

2	Slide design	The poster design is unattractive and lacks creativity	The poster design is somewhat unattractive and lacks creativity	The poster design is moderately attractive and creative	Poster design is attractive and creative	Poster design is highly attractive and creative	20%		
3	Poster Content	The poster content is not informative and up-to-date	The poster content is somewhat informative and up-to-date	Poster content is moderately informative and up-to-date	Poster content is informative and up-to-date	Poster content is highly informative and up-to-date	25%		
4	Sentence Structure	Long and unclear sentences are used	Short, concise, and somewhat unclear sentences are used	Short, concise, and moderately clear sentences are used	Short, concise, and clear sentences are used	Short, concise, and highly clear sentences are used	10%		
Presentation Method									
5	Quality of Material Delivery	The material is delivered unclearly, using non-standard language and inappropriate body language and eye contact.	The material is delivered somewhat unclearly, using non-standard language and inappropriate body language and eye contact.	The material is delivered moderately clearly, using standard language but with inappropriate body language and eye contact.	The material is delivered clearly, using standard language and appropriate body language and eye contact.	The material is delivered very clearly, using a standard language, and appropriate body language and eye contact	15%		

6	Response to Participant Questions (Q&A)	The presenter cannot explain all questions, suggestions, and criticisms from participants, and participants seem not to understand what the presenter is conveying.	The presenter can explain most questions, suggestions, and criticisms from participants but with some difficulty, and participants seem to somewhat understand what the presenter is conveying.	The presenter can explain most questions, suggestions, and criticisms from participants reasonably well, and participants seem to fairly understand what the presenter is conveying.	The presenter can explain all questions, suggestions, and criticisms from participants effectively, and participants seem to understand what the presenter is conveying.	The presenter can explain all questions, suggestions, and criticisms from participants very effectively, and participants seem to highly understand what the presenter is conveying.	15%		
TOTAL							100%		

ASSESSMENT CRITERIA: ARTICLE SUMMARY REVIEW

No	Research Criteria	Very Poor	Fair	Very Good	Weight (%)	Score	Total (Weight x Score)
		40-60	61-80	81-100			
1	Report structure (complete report: cover, abstract, table of contents, introduction (background and objectives), methods (if needed), journal review discussion, conclusion (summary and recommendations) references).	Incomplete and poorly organized report	Complete but not well-organized report	Complete and well-organized report	10%		
2	Writing style (use of capital letters, italics, punctuation) and language and citation writing.	Writing style and citations are incorrect, and non-standard Indonesian language is used.	Writing style and citations are correct, but non-standard Indonesian language is used, or vice versa.	The writing style and citations are correct, and the standard Indonesian language is used.	10%		

3	Introduction and methods	Identifies the background of the problem, objectives, and methods unclearly.	Identifies the background of the problem, objectives, and methods fairly clearly but without related factors.	Identifies the background of the problem, objectives, and methods clearly, along with related factors.	20%		
4	References (minimum of 5 articles)	80% of references are over 5 years old.	80% of references are from the last 5 years.	80% of references are less than 5 years old.	5%		
5	Types of references	80% of references are from national journals.	80% of references are from accredited national journals.	80% of references are from international journals.	10%		
6	Discussion of Journal Review	Discussion is not appropriate (not related to the problem and objectives).	Discussion is somewhat appropriate (somewhat related to the problem and objectives).	Discussion is appropriate (related to the problem and objectives).	20%		
7	Conclusion (summary and recommendations)	The conclusion does not address the problem and objectives.	The conclusion only partially addresses the problem and objectives.	Able to address the problem and objectives.	10%		
8	Interpretation of the overall content	The report's content is not in line with the context/topic, is not up-to-date, and is incomplete. It is unable to provide insights into the review results.	The report's content is somewhat in line with the context/topic, up-to-date, and complete, but it still lacks a clear personal perspective on the review results.	The report's content is in line with the context/topic, up-to-date, and complete. It presents a well-founded personal perspective on the review results, including agreement, criticism, and objections, with valid arguments.	15%		
TOTAL					**100%**		

	AGRICULTURAL PRODUCT TECHNOLOGY STUDY PROGRAM **FACULTY OF AGRICULTURE** **UNIVERSITAS SYIAH KUALA**

STUDENT ASSIGNMENT PLAN
CASE METHOD

COURSE	**FERMENTATION TECHNOLOGY**				
CODE	TPI 263	Credit / ECTS	2 / 3,2	SEMESTER	3
LECTURER	Dr. Dewi Yunita, S.TP., M.Res. Dr. Murna Muzaifa, S.TP., M.P. Ir. Syarifah Rohaya, M.P. Eva Murlida, S.TP., M.Sc.				

ASSIGNMENT FORM

Poster

ASSIGNMENT TITLE

Case Study in the Dairy Fermentation Industry (Yogurt / Cheese)

SUB COURSE LEARNING OUTCOMES

1. Able to explain the factors and microorganisms involved in the process of making dairy fermentation products.
2. Capable of addressing issues that occur in the yogurt and cheese industry.

ASSIGNMENT DESCRIPTION

Each group consisting of 3-4 students will be given a problem/case that has occurred in the yogurt/cheese industry.

ASSIGNMENT EXECUTION METHOD

1. An in-depth study of the material/concept, presentation of the case, and group formation will be provided in the 5th meeting.
2. Case solving, which includes searching for theories/data, conducting simple laboratory tests, and creating a poster, will be done in the 6th meeting. Students can consult with assistants, laboratory staff, course instructors, and teaching practitioners as needed.
3. Presentation of work results in the form of posters, discussions, assessments, and feedback will be conducted in the 7th meeting.
4. Poster revisions will be uploaded to the e-learning platform in the 8th meeting. Information regarding the submission of assignments can be accessed on e-learning.

OUTPUT FORM AND FORMAT

a. Work Object: Graphic design application (Ms. PowerPoint / Canva)

b. Output Requirements:

- **a.** The poster is created in A3 size with a Portrait layout.
- **b.** The top part of the poster consists of the Title, Names, and Student Numbers of all participating students, the program name, and the university logo.
- **c.** The content of the poster includes the background of the case, literature study results/simple laboratory testing, case analysis and resolution, laboratory testing documentation, and conclusions.
- **d.** The bottom part of the poster includes the list of references (at least 3 references from the last 5 years) and acknowledgments (if any).

ASSESSMENT INDICATORS, CRITERIA, AND WEIGHTS
Participatory Activities consisting of: Attitude: 20% Discussion: 30% Presentation: 25% Poster: 25%
SCHEDULE
Group assignment: September 12, 2022 Case testing: September 13-25, 2022 Presentation: September 26 and October 3
OTHER INFORMATION
The weight of this assignment in the overall assessment is 50%.
REFERENCES
Farnworth, E.R. 2008. *Handbook of Fermented Functional Foods*. CRC Press, USA. Riadi, L. 2013. *Teknologi Fermentasi*. Graha Ilmu, Yogyakarta Rahayu, W., R. Pambayun., U. Santoso., Giyatmi dan Ardiansyah. 2017. Ensiklopedia Produk Pangan Indonesia. PT Penerbit IPB press, Bogor.

STUDENT WORKSHEET

Objectives

1. Able to explain the factors and microorganisms involved in the process of making dairy fermentation products.
2. Capable of addressing issues that occur in the yogurt and cheese industry.

List of Cases

a. Yoghurt Industry (Yahuud Yoghurt) for Class 1

Group	List of Cases
1	How do we quickly test the quality of milk for yogurt raw materials?
2	What qualitative tests are needed to ensure the starter culture used for yogurt is in good condition?
3	What qualitative tests are needed to ensure the yogurt produced is in good condition?
4	What causes the yogurt produced to have a watery texture? And how to overcome it?
5	What causes the yogurt produced to produce gas? And how to overcome it?
6	How do you make yogurt with adjustable fat content?

b. Cheese Industry (Mazaraat Cheese) for Class 2

Group	List of Cases
1	In batch 2 (18:00 – 02:00), Cheddar production was carried out. The starter used in that batch is the STI12 bacterial culture, which is Streptococcus thermophilus bacteria. During the production process, there was a problem with the slow pH decrease, which took a long time to reach the expected pH. Then another problem arose: after the pressing process, the cheese swelled, and when cut, small holes appeared in the cheese. Why did this happen, and what is the solution?
2	In batch 1 (06:00-14:00), Cantal production was carried out. When receiving raw materials, the quality of the milk was checked, with a temperature result of 31°C and a pH of 7.3. Production was carried out with the appropriate recipe and SOP. However, during the ripening process (fermentation after adding the starter culture to the milk), the pH did not decrease and did not reach the expected pH. What caused this issue? What corrective action can be taken for that batch? How can similar problems be prevented in the future?
3	In batch 2 (18:00-02:00), Mozzarella production was carried out. When receiving raw materials, the quality of the milk was checked, with a temperature result of 29°C and a pH of 6.0. Production was carried out as usual with the appropriate recipe and SOP. During the curd stretching process (before stretching), a gas formed in the curd and expanded (puffing). There were numerous small holes in the cut curd, which had a yeasty aroma. Why did this happen? What corrective action can be taken? Can a corrective action be implemented to prevent similar problems in the future?
4	During the coagulation process (after adding rennet), curd formation took a long

	time, up to 2 hours (should be 30 minutes), and the curd formed was very weak. What caused this issue, and what corrective action can be taken for that batch? How can similar problems be prevented in the future?
5	In a batch production of Colby cheese (Semi-hard cheese), the recipe and process were followed according to SOP, and no issues occurred. However, matured cheese ready for sale exhibited anomalies during the ripening period (3 months later). The cheese swelled, and when cut, it contained numerous small holes. What caused this issue? What corrective action can be taken for that batch? How can similar problems be prevented in the future?
6	After aging, some cheese exhibited defects, including: a. Tomme cheese (semi-hard cheese) developed an ammonia aroma, and the cheese rind softened and became watery. b. Cheddar cheese (semi-hard cheese) releases moisture from within the cheese. What caused these issues, and what corrective action can be taken? How can similar problems be prevented in the future?
7	After aging, some cheese exhibited defects, including: a. Camembert cheese (bloomy rind cheese) had an undesirable bitter taste. b. Fourme d'Ambert cheese (blue cheese) did not develop blue veins. c. Cheddar cheese (semi-hard cheese) had a pungent and spicy aroma and flavor, with several greenish-blue lines inside. What caused these issues, and what corrective action can be taken? How can similar problems be prevented in the future?
8	During several batches of Mozzarella cheese production, various issues occurred: a. During stretching, the curd could not be easily stretched (lacked elasticity). b. A yellow layer formed on the surface of the hot water during stretching, and the Mozzarella surface became rough (should be smooth). c. Mozzarella had a rubbery texture and did not melt easily when heated. What caused these issues, and what corrective action can be taken for those batches? How can similar problems be prevented in the future?
9	During the production process, several problems occurred, including: a. During stirring, the curd broke into small pieces (the size of rice grains). b. During molding and pressing, the curd did not fuse together, causing the cheese to break when removed from the mold. What caused these issues, and what corrective action can be taken for those batches? How can similar problems be prevented in the future?
10	After aging, some cheese exhibited defects, including: c. a. Cotija cheese (semi-hard cheese) had a bland taste, not as expected (off-flavor). d. b. Cheddar cheese (semi-hard cheese) had an overly hard texture. e. c. Alpine cheese (semi-hard cheese) had a dry and crumbly texture. What caused these issues, and what corrective action can be taken for those batches? How can similar problems be prevented in the future?

Lampiran 3. Contoh Portofolio

FERMENTATIO N TECHNOLOGY PORTFOLIO (TPI263)

Odd 2022/2023

Agricultural Product Technology
Faculty of Agriculture
Universitas Syiah Kuala
2022

COURSE PORTFOLIO

FERMENTATION TECHNOLOGY (TPI263)

Semester 3 (Total Credits: 2 - 0)

Undergraduate Program in
Agricultural Product Technology

Faculty of Agriculture - Universitas Syiah Kuala

Process	Person in Charge			Date
	Name	Position	Signature	
Formulator	Dr. Dewi Yunita, S.TP., M.Res.	Course Coordinator		Jan 2, 2023
Examiner	Dr. Santi Noviasari, S.TP., M.Si	Academic Quality Assurance Team		
Approver	Dr. Ir. Mhd. Ikhsan Sulaiman, S.TP., M.Sc., IPU	Head of Study Program		

a. Graduate Learning Outcomes (GLO)

GLO-A3	Innovative and creative in working independently and in teams to solve problems and challenges with lifelong learning.
GLO-K3	Master scientific principles in solving agricultural technology problems
GLO- GS1	Able to make informed decisions in solving problems based on science and technology of agricultural products.
GLO-SSFT1	Able to process agricultural products based on biochemical and food nutrition concepts

A = Attitude, K = Knowledge, SS = Specific Skills, GS = General Skills

b. Course Learning Outcomes (CLO)

CLO-1	Able to mention raw material-based fermented food products and explain their production processes (Cognitive 1)
CLO-2	Able to explain the factors and microorganisms involved in their production processes (Cognitive 2)
CLO-3	Able to address issues that occur in the dairy fermentation industry (Cognitive 6, Affective 5, Psychomotor 5)

c. The Conformity matrix of CLO x GLO and GP

CLO	GLO																		GRADUATE PROFILE
	ATTITUDE				KNOWLEDGE			SPECIFIC SKILLS						GENERAL SKILLS					
								FOOD TECHNOLOGY			AGRICULTURAL INDUSTRY TECHNOLOGY								
	1	2	3	4	1	2	3	1	2	3	1	2	3	1	2	3	4	5	
1								√											1) Manager/ Supervisor 2) Entrepreneur 3) Research Assistant
2								√											
3			√				√							√					

d. Assessment Criteria and Standards

Components of Assessment		Course Learning Outcomes	Percentage (Weight in Final Grade)	Minimum Student Performance Score	Assessment Standards
Attitude	Participatory Activities*	CLO3	10%	51	A≥87; 78≤AB<87; 69≤B<78; 60≤BC<69; 51≤C<60; 41≤D<51; E<41
Skills	Project Results/Case Studies*	CLO3	40%	51	
Knowledge	Quiz	CLO 1 and 2	5%	51	
	Exam 1	CLO 1 and 2	15%	51	
	Exam 2	CLO 1 and 2	15%	51	
	Exam 3	CLO 1 and 2	15%	51	
Total			**100%**		

*****Total score for Participatory Activities and Project Results: minimum 50% for case-based and project-based courses.

e. Assessment Weighting

No	Components of Assessment	Attitude GLO	Knowledge GLO		General Skill GLO	Specific Skill GLO	Weight (%)	Lecturer
		CLO 3	CLO 1	CLO 2	CLO 3	CLO 3		
1	Participatory Activities*	Participatory Activities					10%	DY
2	Case Assignment*				Presentation, Discussion	Poster 1	40%	DY
3	Quiz		Assessment Sheet	Assessment Sheet			5%	MM
4	Exam 1		Short Summary	Short Summary			15%	MM
5	Exam 2		Report	Report			15%	EM
6	Exam 3		Poster 2		Presentation, Discussion		15%	SR

***Total score for Participatory Activities and Project Results: minimum 50% for case-based and project-based courses.
Project results can take the form of Reports/Prototypes/Posters/Products.

a. Collection of Assignment/Homework/Exam Questions

ASSIGNMENT 1 (MM)

Write a paper on one of the traditional Indonesian food products.
Guidelines:

1. Sources of writing can be obtained by reviewing several articles from journals, books, and proceedings and supplemented from other internet readings that support the topic.
2. Submission is due on the 3rd meeting.
3. Use the attached format (specifically for products that are still very traditional and rarely researched; chemical composition and microorganism data may not be available; you can leave it blank or mention that there is no data).

ASSIGNMENT 2 (EM)

1. The assignment is done in groups (members: 3 - 4 people in 1 group).
2. The task involves finding industries or places that produce fermentation products, from cereals, legumes, tubers, fish, and other aquatic

products.

3. Conduct on-site visits to these industries and study the processing and product development processes based on fermentation technology, then write the results in a brief report.
4. Assessment is based on the report (presentation) and discussion.

CASE ASSIGNMENT (DY)

A case study in the dairy fermentation industry (yogurt/cheese). Each group of 3-4 students will be given a specific problem/case in the yogurt/cheese industry.

1. An in-depth understanding of the material/concept, presentation of the case, and group formation will be provided during the 5th meeting.
2. Case solving involves searching for theories/data, conducting simple laboratory tests, and creating a poster during the 6th meeting. Students can consult with assistants, lab staff, course instructors, and teaching practitioners as needed.
3. Presentation of the work's results, including the poster, discussion, evaluation, and feedback, will take place during the 7th meeting.
4. Poster revisions should be uploaded to e-learning during the 8th meeting.

ASSIGNMENT 3 (SR)

1. The assignment is done by 2 to 3 students in one group.
2. Review journals on fermented food products.
3. Present the findings in the form of a poster and deliver a presentation.
4. Assessment includes:
   - Poster
   - Presentation
   - Answer questions from the audience

b. Measurement of GLO in CLO

ATTITUDE Measurement

Student Number	Student Name	Participatory Activities			Average Attitude Score	Description
		Attendance	Activeness	Punctuality		
CLASS 1						
2105105010012	WINA AYUNI	92	92	92	92	Excellent
2105105010018	SAFRINA NURUL FADILLA	75	75	75	75	Good
2105105010019	ULFATUN NISA FITRI	92	92	92	92	Excellent
2105105010020	PUTRI BUNDA	92	92	92	92	Excellent
2105105010024	ROSITA	100	100	100	100	Excellent
2105105010025	BERLIANA BALQIS AISYAH	92	92	92	92	Excellent
2105105010027	RIKA MARIANA	92	92	92	92	Excellent
2105105010040	QATRUNNADA	92	92	92	92	Excellent
2105105010053	SYAFNA TRISTIA WIDA	92	92	92	92	Excellent
2105105010056	AJRIN HALIM	92	92	92	92	Excellent
2105105010061	MIRA HAYATI	67	67	67	67	Sedang
2105105010072	CHAIRANI FADHILLAH	83	83	83	83	Excellent
2105105010074	MOHD FURQAN	67	67	67	67	Average
CLASS 2						
2105105010002	VEBRIANDA MUHAMMAD PRATAMA	67	67	67	67	Sedang
2105105010003	MIFTACHUL NISA	100	100	100	100	Excellent
2105105010005	RAISA SHOLEHA	100	100	100	100	Excellent
2105105010010	TALISA NURUL FADILLAH BATU BARA	92	92	92	92	Excellent
2105105010030	FATHHI MAGHFIRAH	100	100	100	100	Excellent
2105105010031	SYIFA ZALZAFUN	100	100	100	100	Excellent
2105105010034	RETNO SUPRIANTI	100	100	100	100	Excellent

2105105010038	ANGGI ANGRAINI	100	100	100	100	Excellent
2105105010039	SYIFA AS SAKINAH	100	100	100	100	Excellent
2105105010041	MAHARANI AGUSTINA	100	100	100	100	Excellent
2105105010043	ULFA ANNISA	92	92	92	92	Excellent
2105105010047	AHMAD KHAIRULSALIM	100	100	100	100	Excellent
2105105010060	MAHARANI PUTRI	100	100	100	100	Excellent
2105105010062	FADLINA	92	92	92	92	Excellent
2105105010064	AURA ADILLA	92	92	92	92	Excellent
2105105010066	TASYA MELIZA	92	92	92	92	Excellent
2105105010077	ALZENA RAHMA	83	83	83	83	Very Good
2204102424036120001	Fauzan Muharam	92	92	92	92	Excellent
2200100824020120120025	Silfia Arzakina	92	92	92	92	Excellent
22001054A0420519	Aldi Rahmat	100	100	100	100	Excellent

KNOWLEDGE Measurement

Student Number	Student Name	MM		EVA		SR	Average Knowledge Score	Description
		Quiz	Assignment 1	Quiz	Assignment 2	Assignment 3		
CLASS 1								
2105105010012	WINA AYUNI	80	86	100	100	84	90	Excellent
2105105010018	SAFRINA NURUL FADILLA	80	86	92	80	83	83	Very Good
2105105010019	ULFATUN NISA FITRI	80	87	95	90	85	87	Excellent
2105105010020	PUTRI BUNDA	80	85	95	90	83	86	Very Good
2105105010024	ROSITA	80	85	95	92	83	87	Very Good
2105105010025	BERLIANA BALQIS AISYAH	80	89	100	100	84	91	Excellent
2105105010027	RIKA MARIANA	80	86	92	92	83	87	Very Good
2105105010040	QATRUNNADA	80	86	92	85	83	85	Very Good
2105105010053	SYAFNA TRISTIA WIDA	80	88	92	80	84	84	Very Good
2105105010056	AJRIN HALIM	83	88	100	82	84	85	Very Good
2105105010061	MIRA HAYATI	85	70	100	90	85	83	Very Good

2105105010072	CHAIRANI FADHILLAH	80	86	100	92	84	88	Excellent
2105105010074	MOHD FURQAN	80	86	100	80	84	84	Very Good
CLASS 2								
2105105010002	VEBRIANDA MUHAMMAD PRATAMA	75	85	100	88	87	87	Very Good
2105105010003	MIFTACHUL NISA	84	89	100	80	84	85	Very Good
2105105010005	RAISA SHOLEHA	85	87	100	85	85	86	Very Good
2105105010010	TALISA NURUL FADILLAH BATU BARA	85	87	100	90	85	88	Excellent
2105105010030	FATHHI MAGHFIRAH	80	90	90	90	87	89	Excellent
2105105010031	SYIFA ZALZAFUN	84	90	90	90	85	88	Excellent
2105105010034	RETNO SUPRIANTI	87	87	90	85	85	86	Very Good
2105105010038	ANGGI ANGRAINI	75	86	85	85	84	85	Very Good
2105105010039	SYIFA AS SAKINAH	82	88	85	90	88	88	Excellent
2105105010041	MAHARANI AGUSTINA	75	88	85	90	82	86	Very Good
2105105010043	ULFA ANNISA	75	87	95	85	87	86	Very Good
2105105010047	AHMAD KHAIRULSALIM	85	86	95	95	87	89	Excellent
2105105010060	MAHARANI PUTRI	86	87	95	90	82	87	Very Good
2105105010062	FADLINA	84	89	65	85	84	85	Very Good
2105105010064	AURA ADILLA	78	88	65	85	85	85	Very Good
2105105010066	TASYA MELIZA	75	87	65	85	84	84	Very Good
2105105010077	ALZENA RAHMA	70	85	65	85	85	83	Very Good
2204102424036120001	Fauzan Muharam	70	87	65	85	82	83	Very Good
2200100824020120120025	Silfia Arzakina	95	92	65	80	88	86	Very Good
22001054A0420519	Aldi Rahmat	70	85	65	80	82	81	Very Good

GENERAL SKILL Measurement

Student Number	Student Name	DY		SR		Average Attitude Score	Description
		Discussion	Presentation	Discussion	Presentation		
CLASS 1							
2105105010012	WINA AYUNI	90	89	90	82	88	Excellent
2105105010018	SAFRINA NURUL FADILLA	90	86	90	82	87	Excellent
2105105010019	ULFATUN NISA FITRI	90	86	90	85	88	Excellent
2105105010020	PUTRI BUNDA	90	80	90	85	86	Very Good
2105105010024	ROSITA	90	80	90	83	86	Very Good
2105105010025	BERLIANA BALQIS AISYAH	90	88	90	84	88	Excellent
2105105010027	RIKA MARIANA	90	85	90	85	88	Excellent
2105105010040	QATRUNNADA	90	83	90	82	86	Very Good
2105105010053	SYAFNA TRISTIA WIDA	90	87	90	82	87	Excellent
2105105010056	AJRIN HALIM	90	88	90	88	89	Excellent
2105105010061	MIRA HAYATI	90	73	90	83	84	Very Good
2105105010072	CHAIRANI FADHILLAH	90	81	90	80	85	Very Good
2105105010074	MOHD FURQAN	90	92	90	88	90	Excellent
CLASS 2							
2105105010002	VEBRIANDA MUHAMMAD PRATAMA	90	86	90	86	88	Excellent
2105105010003	MIFTACHUL NISA	90	80	90	83	86	Very Good
2105105010005	RAISA SHOLEHA	90	79	90	80	85	Very Good
2105105010010	TALISA NURUL FADILLAH BATU BARA	90	87	90	80	87	Very Good
2105105010030	FATHHI MAGHFIRAH	90	83	90	84	87	Very Good
2105105010031	SYIFA ZALZAFUN	90	81	90	82	86	Very Good
2105105010034	RETNO SUPRIANTI	90	84	90	82	87	Very Good
2105105010038	ANGGI ANGRAINI	90	84	90	83	87	Very Good
2105105010039	SYIFA AS SAKINAH	90	84	90	86	88	Excellent

2105105010041	MAHARANI AGUSTINA	90	86	90	79	86	Very Good
2105105010043	ULFA ANNISA	90	79	90	84	86	Very Good
2105105010047	AHMAD KHAIRULSALIM	90	82	90	86	87	Istimewa
2105105010060	MAHARANI PUTRI	90	80	90	79	85	Very Good
2105105010062	FADLINA	90	84	90	83	87	Very Good
2105105010064	AURA ADILLA	90	84	90	88	88	Excellent
2105105010066	TASYA MELIZA	90	84	90	83	87	Very Good
2105105010077	ALZENA RAHMA	90	82	90	85	87	Very Good
2204102424036120001	Fauzan Muharam	90	76	90	78	84	Very Good
2200100824020120120025	Silfia Arzakina	90	85	90	87	88	Excellent
22001054A0420519	Aldi Rahmat	90	76	90	78	84	Very Good

SPECIFIC SKILL Measurement

Student Number	Student Name	Poster	Description
CLASS 1			
2105105010012	WINA AYUNI	84	Very Good
2105105010018	SAFRINA NURUL FADILLA	84	Very Good
2105105010019	ULFATUN NISA FITRI	84	Very Good
2105105010020	PUTRI BUNDA	83	Very Good
2105105010024	ROSITA	83	Very Good
2105105010025	BERLIANA BALQIS AISYAH	83	Very Good
2105105010027	RIKA MARIANA	83	Very Good
2105105010040	QATRUNNADA	83	Very Good
2105105010053	SYAFNA TRISTIA WIDA	83	Very Good
2105105010056	AJRIN HALIM	86	Very Good
2105105010061	MIRA HAYATI	86	Very Good
2105105010072	CHAIRANI FADHILLAH	86	Very Good
2105105010074	MOHD FURQAN	86	Very Good

CLASS 2			
2105105010002	VEBRIANDA MUHAMMAD PRATAMA	81	Very Good
2105105010003	MIFTACHUL NISA	81	Very Good
2105105010005	RAISA SHOLEHA	81	Very Good
2105105010010	TALISA NURUL FADILLAH BATU BARA	86	Very Good
2105105010030	FATHHI MAGHFIRAH	82	Very Good
2105105010031	SYIFA ZALZAFUN	82	Very Good
2105105010034	RETNO SUPRIANTI	82	Very Good
2105105010038	ANGGI ANGRAINI	83	Very Good
2105105010039	SYIFA AS SAKINAH	83	Very Good
2105105010041	MAHARANI AGUSTINA	83	Very Good
2105105010043	ULFA ANNISA	84	Very Good
2105105010047	AHMAD KHAIRULSALIM	84	Very Good
2105105010060	MAHARANI PUTRI	83	Very Good
2105105010062	FADLINA	85	Very Good
2105105010064	AURA ADILLA	85	Very Good
2105105010066	TASYA MELIZA	83	Very Good
2105105010077	ALZENA RAHMA	85	Very Good
2204102424036120001	Fauzan Muharam	85	Very Good
220010082402012012025	Silfia Arzakina	85	Very Good
22001054A0420519	Aldi Rahmat	83	Very Good

c. Assessment of Student Success

Student Number	Student Name	CLO 1 and 2				CLO3		Final Grade	
		Quiz	Assignment 1	Assignment 2	Assignment 3	Participatory Activity	Case Assignment	Numeric Grade	Letter Grade
		5%	15%	15%	15%	10%	40%		
2105105010012	WINA AYUNI	90.0	86.0	100.0	84.0	91.7	85.8	88.5	A
2105105010018	SAFRINA NURUL FADILLA	86.0	86.0	80.0	83.0	75.0	85.5	83.4	AB
2105105010019	ULFATUN NISA FITRI	87.5	87.0	90.0	85.0	91.7	85.8	87.2	A
2105105010020	PUTRI BUNDA	87.5	85.0	90.0	83.0	91.7	85.1	86.3	AB
2105105010024	ROSITA	87.5	85.0	92.0	83.0	100.0	84.8	87.3	A
2105105010025	BERLIANA BALQIS AISYAH	90.0	89.0	100.0	84.0	91.7	86.0	89.0	A
2105105010027	RIKA MARIANA	86.0	86.0	92.0	83.0	91.7	85.7	86.9	A
2105105010040	QATRUNNADA	86.0	86.0	85.0	83.0	91.7	85.1	85.6	AB
2105105010053	SYAFNA TRISTIA WIDA	86.0	88.0	80.0	84.0	91.7	85.6	85.5	AB
2105105010056	AJRIN HALIM	91.5	88.0	82.0	84.0	91.7	86.4	86.4	AB
2105105010061	MIRA HAYATI	92.5	70.0	90.0	85.0	66.7	84.0	81.6	AB
2105105010072	CHAIRANI FADHILLAH	90.0	86.0	92.0	84.0	83.3	84.5	85.9	AB
2105105010074	MOHD FURQAN	90.0	86.0	80.0	84.0	66.7	87.0	83.5	AB
2105105010002	VEBRIANDA MUHAMMAD PRATAMA	87.5	85.0	88.0	87.0	66.7	86.0	84.4	AB
2105105010003	MIFTACHUL NISA	92.0	89.0	80.0	84.0	100.0	84.8	86.5	AB
2105105010005	RAISA SHOLEHA	92.5	87.0	85.0	85.0	100.0	84.3	86.9	A
2105105010010	TALISA NURUL FADILLAH BATU BARA	92.5	87.0	90.0	85.0	91.7	85.3	87.2	A
2105105010030	FATHHI MAGHFIRAH	85.0	90.0	90.0	87.0	100.0	85.3	88.4	A
2105105010031	SYIFA ZALZAFUN	87.0	90.0	90.0	85.0	100.0	84.8	88.0	A
2105105010034	RETNO SUPRIANTI	88.5	87.0	85.0	85.0	100.0	85.2	87.1	A
2105105010038	ANGGI ANGRAINI	80.0	86.0	85.0	84.0	100.0	85.3	86.4	AB
2105105010039	SYIFA AS SAKINAH	83.5	88.0	90.0	88.0	100.0	85.7	88.4	A
2105105010041	MAHARANI AGUSTINA	80.0	88.0	90.0	82.0	100.0	85.1	87.0	A

2105105010043	ULFA ANNISA	85.0	87.0	85.0	87.0	91.7	84.8	86.2	AB
2105105010047	AHMAD KHAIRULSALIM	90.0	86.0	95.0	87.0	100.0	85.5	88.9	A
2105105010060	MAHARANI PUTRI	90.5	87.0	90.0	82.0	100.0	84.3	87.1	A
2105105010062	FADLINA	74.5	89.0	85.0	84.0	91.7	85.3	85.7	AB
2105105010064	AURA ADILLA	71.5	88.0	85.0	85.0	91.7	85.9	85.8	AB
2105105010066	TASYA MELIZA	70.0	87.0	85.0	84.0	91.7	85.3	85.2	AB
2105105010077	ALZENA RAHMA	67.5	85.0	85.0	85.0	83.3	85.3	84.1	AB
2204102424036120001	Fauzan Muharam	67.5	87.0	85.0	82.0	91.7	83.8	84.1	AB
2200100824020120120025	Silfia Arzakina	80.0	92.0	80.0	88.0	91.7	86.0	86.6	A
22001054A0420519	Aldi Rahmat	67.5	85.0	80.0	82.0	100.0	83.8	83.9	AB
AVERAGE GRADE		**84.3**	**86.6**	**87.3**	**84.5**	**91.4**	**85.3**		
CLO ACHIEVEMENT		**85.7**				**88.3**			

d. Course Performance

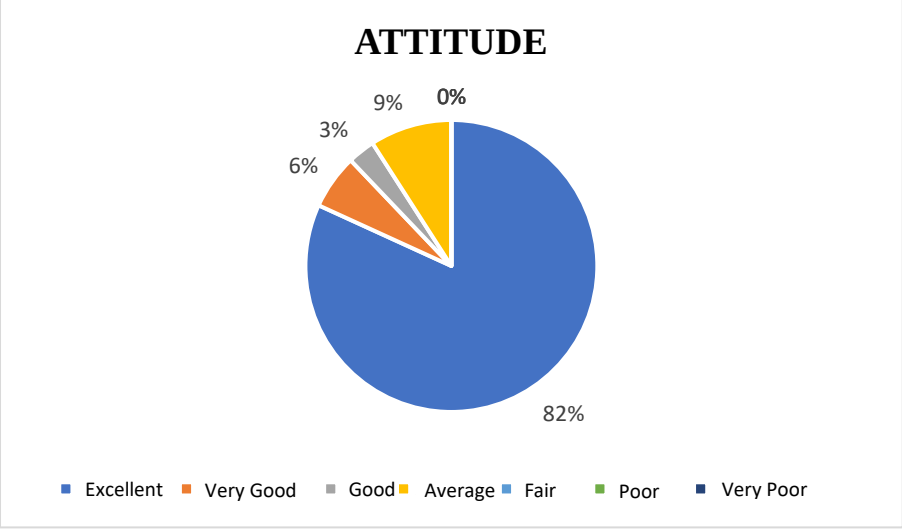
Achievement of CLO in Fermentation Technology

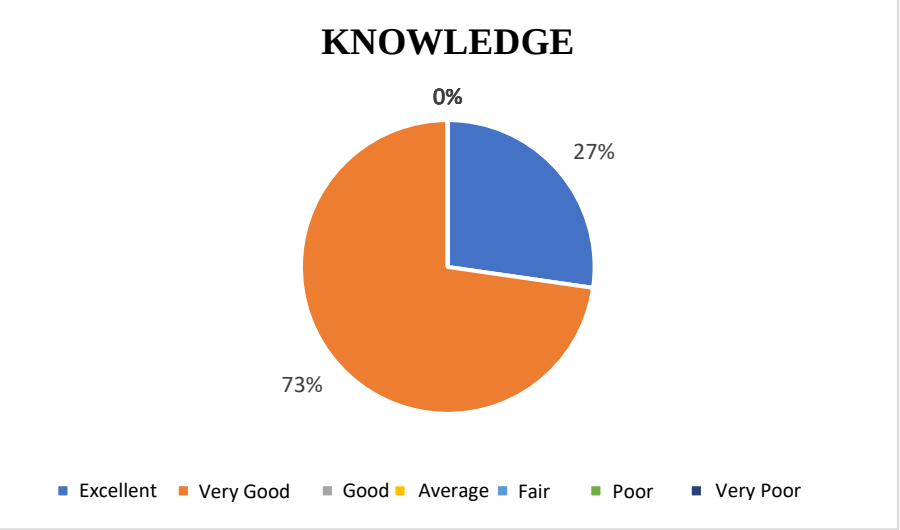
CLO	Achievement Score	Standard	Evaluation
CLO 1	85.7	51	Has Met the Standard
CLO 2	85.7	51	Has Met the Standard
CLO 3	88.3	51	Has Met the Standard

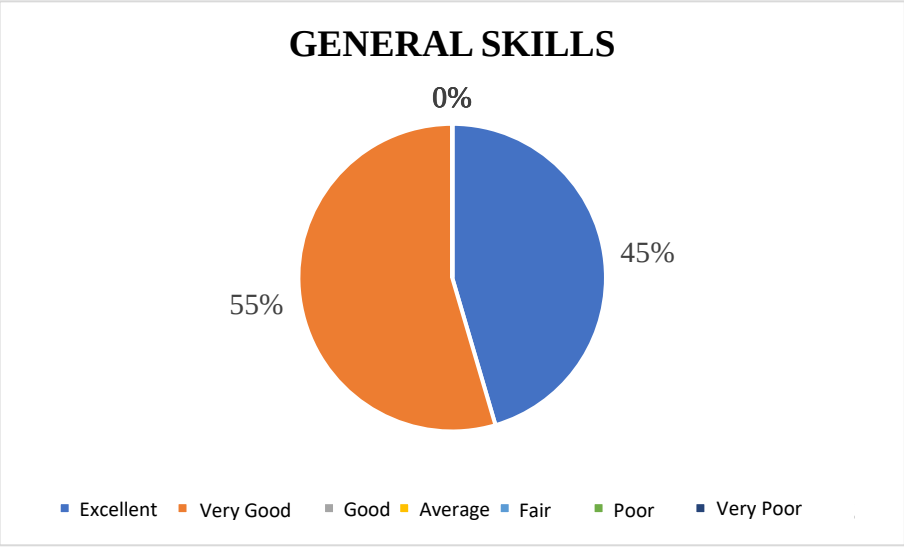
GLO Achievement in the Fermentation Technology Course

CLO	GLO																		
	ATTITUDE				KNOWLEDGE			SPECIFIC SKILLS						GENERAL SKILLS					
								FOOD TECHNOLOGY			AGRICULTURAL INDUSTRY TECHNOLOGY								
	1	2	3	4	1	2	3	1	2	3	1	2	3	1	2	3	4	5
1								85.7										
2								85.7										
3			88.3				88.3							88.3				

Class Achievement in the Fermentation Technology Course towards GLO







j. Course Development Plan

The measurement of GLO-A3 (innovative and creative in working independently and in teams to solve problems and challenges) in the Fermentation Technology course (able to address issues in the dairy fermentation industry; CLO3) is based on participatory activities consisting of three measurement aspects: attendance, participation, and timeliness. The measurement results show that 82% of students have exceptional innovative and creative qualities. However, the measurement aspects do not fully reflect innovative and creative attitudes, so the assessment rubric needs revision in the next academic year.

The measurement of GLO-K3 (able to formulate problem solutions using scientific methods) in the Fermentation Technology course (able to address issues in the dairy fermentation industry; CLO3) shows that 73% of students have very good knowledge. The percentage of measurement can be improved by providing cognitive assessments (exams) in addition to assignments.

In terms of specific skills, all students have excellent assessments, indicating uniform capabilities among students. Meanwhile, most students (55%) also have very good assessments regarding general skills. Both aspects can still be improved by presenting cases not only on one-course topic.

Appendix 4. Credit Conversion Table - ECTS

KEMENTERIAN PENDIDIKAN, KEBUDAYAAN,
RISET, DAN TEKNOLOGI
UNIVERSITAS SYIAH KUALA
Darussalam, Banda Aceh 23111
Telepon (0651) 7553205, 7553248, 7554394, 7554395, 7554396, 7554398
Faksimile (0651) 7554229, 7551241, 7552730, 7553408
Laman www.unsyiah.ac.id, Surel info@unsyiah.ac.id

KEPUTUSAN REKTOR UNIVERSITAS SYIAH KUALA

NOMOR 4435/UN11/KPT/2022

TENTANG

PENETAPAN PERHITUNGAN BEBAN STUDI MAHASISWA
DAN KONVERSI SKS KE *EUROPEN CREDIT TRANSFER*
AND ACCUMULATION SYSTEM (ECTS)
FAKULTAS PERTANIAN UNIVERSITAS SYIAH KUALA

REKTOR UNIVERSITAS SYIAH KUALA,

Membaca : Surat Dekan Fakultas Pertanian Nomor B/2994/UN11.1.5/RT.00.00/2022 tanggal 8 September 2022, perihal usulan permohonan keputusan Rektor Universitas Syiah Kuala.

Menimbang :
a. bahwa untuk kelancaran kegiatan perkuliahan Mahasiswa Fakultas Pertanian Universitas Syiah Kuala, maka perlu ditetapkan perhitungan beban studi mahasiswa dan konversi SKS ke ECTS untuk itu;
b. bahwa untuk keperluan dimaksud, perlu ditetapkan dengan Keputusan Rektor;

Mengingat :
1. Undang-Undang Nomor 17 Tahun 2003 tentang Keuangan Negara;
2. Undang-Undang Nomor 1 Tahun 2004 tentang Perbendaharaan Negara;
3. Undang-Undang Nomor 12 Tahun 2012 tentang Pendidikan Tinggi;
4. Undang-Undang Nomor 6 Tahun 2021 tentang Anggaran Pendapatan dan Belanja Negara Tahun Anggaran 2022;
5. Peraturan Pemerintah Nomor 4 Tahun 2014 tentang Penyelenggaraan Pendidikan Tinggi dan Pengelolaan Perguruan Tinggi;
6. Peraturan Menteri Keuangan Nomor 60/PMK.02/2021 tentang Standar Biaya Masukan Tahun Anggaran 2022;
7. Peraturan Menteri Riset, Teknologi, dan Pendidikan Tinggi Nomor 48 Tahun 2015 tentang Organisasi dan Tata Kerja Universitas Syiah Kuala sebagaimana telah diubah dengan Peraturan Menteri Riset, Teknologi, dan Pendidikan Tinggi Nomor 124 Tahun 2016 tentang Perubahan Atas Peraturan Menteri Riset, Teknologi, dan Pendidikan Tinggi Nomor 48 Tahun 2015 tentang Organisasi dan Tata Kerja Universitas Syiah Kuala;
8. Peraturan Menteri Riset, Teknologi, dan Pendidikan Tinggi Nomor 99 Tahun 2016 tentang Statuta Universitas Syiah Kuala;
9. Keputusan Menteri Keuangan Nomor 361/KMK.05/2018 tentang Penetapan Universitas Syiah Kuala pada Kementerian Riset, Teknologi, dan Pendidikan Tinggi sebagai Instansi Pemerintah yang Menerapkan Pola Pengelolaan Keuangan Badan Layanan Umum;

10. Keputusan Menteri Pendidikan, Kebudayaan, Riset, dan Teknologi Nomor 11837/MPK.A/KP.07.00/2022 tentang Pengangkatan Rektor Universitas Syiah Kuala Periode Tahun 2022-2026;

MEMUTUSKAN:

Menetapkan : PENETAPAN PERHITUNGAN BEBAN STUDI MAHASISWA DAN KONVERSI SKS KE *EUROPEN CREDIT TRANSFER AND ACCUMULATION SYSTEM* (ECTS) FAKULTAS PERTANIAN UNIVERSITAS SYIAH KUALA.

KESATU : Menetapkan Perhitungan Beban Studi Mahasiswa dan Konversi SKS ke *EUROPEN CREDIT TRANSFER AND ACCUMULATION SYSTEM* (ECTS) Fakultas Pertanian Universitas Syiah Kuala sebagaimana tercantum dalam daftar Lampiran yang merupakan bagian tidak terpisahkan dari keputusan ini.

KEDUA : Segala hal–hal yang belum diatur dalam keputusan ini akan diatur dalam ketentuan tersendiri.

KETIGA : Keputusan ini mulai berlaku pada tanggal ditetapkan dan apabila dalam penetapan ini kemudian ternyata terdapat kekeliruan akan diperbaiki kembali sebagaimana mestinya.

Ditetapkan di Banda Aceh
pada tanggal 19 September 2022

REKTOR UNIVERSITAS SYIAH KUALA,

Prof. Dr. Ir. MARWAN
NIP 196612241992031003

LAMPIRAN
KEPUTUSAN REKTOR UNIVERSITAS SYIAH KUALA
NOMOR 4435/UN11/KPT/2022, TANGGAL 19 SEPTEMBER 2022
TENTANG
PENETAPAN PERHITUNGAN BEBAN STUDI MAHASISWA DAN KONVERSI SKS KE *EUROPEN CREDIT TRANSFER AND ACCUMULATION SYSTEM* (ECTS) FAKULTAS PERTANIAN UNIVERSITAS SYIAH KUALA

a. Untuk Program Sarjana, konversi sks ke ECTS mengikuti ketentuan sebagai berikut:

Jumlah sks	Perhitungan Konversi	Keterangan
1 sks	=170 menit/minggu/ semester =170 menit x14 minggu =2.380 menit =39,7 jam	1. Bentuk pembelajaran1 (satu) sks pada proses belajar-mengajar berupa kuliah, penugasan terstruktur, dan kegiatan mandiri dengan rincian: a. Kegiatan proses belajar-mengajar (kuliah) : 50 (lima puluh) menitper minggu per semester; b. Kegiatan penugasan terstruktur: 60 (enam puluh) menit perminggu per semester; dan c. Kegiatan mandiri 60 (enam puluh) menit perminggu per semester. 2. Satu semester =16 minggu termasuk 2 minggu untuk ujian tengah semester dan ujian akhir.
	=39,7 jam/ 25jam =1,6 ECTS	-1 semester terdiri dari 2 quartal -1 quartal = 12,5 – 15 ECTS, sehingga ditetapkan 1 quartal = 15 ECTS, sebagai standar maksimum -1 ECTS= 25 -30 jam, sehingga ditetapkan 1 ECTS = 25 jam sebagai standar minimum
144 sks	=144 x1,6ECTS =230,4 ECTS	-Kegiatan kurikuler minimal =144 sks
Program Sarjana memiliki kegiatan minimal **144 sks** yang setara dengan **230,4 ECTS**.		

b. Untuk Program Magister, konversi sks ke ECTS mengikuti ketentuan sebagai berikut:

Jumlah sks	Perhitungan Konversi	Keterangan
1 sks	= 290 menit/minggu/ semester = 290 menit x14 minggu = 4.060 menit =67,67 jam	1. Bentuk pembelajaran1 (satu) sks pada proses belajar-mengajar berupa kuliah, penugasan terstruktur, dan kegiatan mandiri dengan rincian: a. Kegiatan proses belajar-mengajar (kuliah) : 50 (lima puluh) menit per minggu per semester; b. Kegiatan penugasan terstruktur 120 (seratus dua puluh) menit perminggu per semester; dan c. Kegiatan mandiri 120 (seratus dua puluh) menit perminggu per semester 2. Satu semester=16 minggu termasuk 2 minggu untuk ujian tengah semester dan ujian akhir.
	= 67,67 jam/ 25 jam =2,7 ECTS	-1 semester terdiridari 2 quartal -1 quartal = 12,5 – 15 ECTS, sehingga ditetapkan 1 quartal = 15 ECTS, sebagai standar maksimum -1 ECTS= 25 -30 jam, sehingga ditetapkan 1 ECTS = 25 jam sebagai standar minimum
36 sks	=36 x 2,7 ECTS = 97,44 ECTS	-Kegiatan kurikuler minimal = 36 sks (based on Indonesia NQF)
Program Magister memiliki kegiatan minimal **36 sks** yang setara dengan **97,44 ECTS**.		

Ditetapkan di Banda Aceh
pada tanggal 19 September 2022

REKTOR UNIVERSITAS SYIAH KUALA,

Prof. Dr. Ir. MARWAN
NIP 196612241992031003

**MINISTRY OF EDUCATION, CULTURE,
RESEARCH, AND TECHNOLOGY
UNIVERSITAS SYIAH KUALA**
Darussalam, Banda Aceh 23111
Telp. (0651) 7553205,7553248,7554364,7554395,7554396,7554398,
Facsimile : (0651) 7554229,7551241.7552730, 7553408
Website : www unsyiah ac id. E-mail:info@unsyiah acid

DECREE OF THE RECTOR OF UNIVERSITAS SYIAH KUALA
NUMBER 4435/UN11/KIT/2022

REGARDING

DETERMINATION OF STUDENT STUDY LOAD CALCULATIONS
AND THE CONVERSION OF CREDIT HOURS TO THE EUROPEAN CREDIT
TRANSFER AND ACCUMULATION SYSTEM (ECTS)
FACULTY OF AGRICULTURE, UNIVERSITAS SYIAH KUALA

RECTOR OF UNIVERSITAS SYIAH KUALA

Having read : The Dean's Letter of the Faculty of Agriculture Number: B/2994/UN11.1.5/RT.00.00/2022, dated September 8, 2022, regarding the proposal for the decision of the Rector of Universitas Syiah Kuala.

Considering :
a. That, for the smooth running of student activities in the Faculty of Agriculture, Universitas Syiah Kuala, it is necessary to determine the calculation of student study loads and the conversion of credit hours to ECTS (European Credit Transfer and Accumulation System);
b. That, for the aforementioned purpose, it is necessary to establish this by the Rector's Decree.

In view of :
1. Law Number 17 of 2003 concerning State Finances;
2. Law Number 1 of 2004 concerning the State Treasury;
3. Law Number 12 of 2012 concerning Higher Education;
4. Law Number 6 of 2021 concerning the State Budget for the 2022 fiscal year;
5. Government Regulation Number 4 of 2014 concerning the Organization of Higher Education and the Management of Higher Education Institutions;
6. Ministry of Finance Regulation Number 60/PM K02/2021 concerning Input Cost Standards for the 2022 fiscal year;
7. Ministry of Research, Technology, and Higher Education Regulation Number 48 of 2015 concerning the Organization and Work Procedures of Universitas Syiah Kuala, as amended by Ministry of Research, Technology, and Higher Education Regulation Number 124 of 2016 concerning Amendments to Ministry of Research, Technology, and Higher Education Regulation Number 48 of 2015 concerning the Organization and Work Procedures of Universitas Syiah Kuala;
8. Ministry of Research, Technology, and Higher Education Regulation Number 99 of 2016 concerning the Statutes of Universitas Syiah Kuala;
9. Ministry of Finance Decision Number 361/KMK05/2018 concerning the Designation of Universitas Syiah Kuala under the Ministry of Research, Technology, and Higher Education as a Government Agency Implementing the Financial Management Pattern of Public Service Agencies.

10. Ministry of Education, Culture, Research, and Technology Decision Number 11837/MPKA/KP.07.00/2022 concerning the Appointment of the Rector of Universitas Syiah Kuala for the 2022-2026 Period.

DECIDES

To Enact : THE DETERMINATION OF STUDENT STUDY LOAD CALCULATIONS AND THE CONVERSION OF CREDIT HOURS TO THE EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS) FOR THE FACULTY OF AGRICULTURE, UNIVERSITAS SYIAH KUALA.

FIRST : Determines the Calculation of Student Study Load and the Conversion of Credit Hours to the EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS) for the Faculty of Agriculture, Universitas Syiah Kuala, as listed in the attached Appendix, which is an integral part of this decision.

SECOND : All matters not regulated in this decision will be regulated separately.

THIRD : This decision shall take effect on the date of its issuance, and any errors subsequently discovered shall be corrected as necessary.

Stipulated in : Banda Aceh
On the Date of : September 19, 2022

RECTOR OF UNIVERSITAS SYIAH KUALA

Digitally Signed

Prof. Dr. Ir. Marwan
Official Reg. No. 196612241992031003

ATTACHMENT
TO THE DECREE OF THE RECTOR OF UNIVERSITAS SYIAH KUALA NUMBER 4435/UN11/KPT/2022, DATED SEPTEMBER 19, 2022
REGARDING
DETERMINATION OF STUDENT COURSE LOAD CALCULATION AND CONVERSION OF CREDIT HOURS TO THE EUROPEAN CREDIT TRANSFER AND ACCUMULATION SYSTEM (ECTS) FACULTY OF AGRICULTURE, UNIVERSITAS SYIAH KUALA.

a. For the Bachelor's Program, the conversion of credit hours to ECTS follows the provisions as follows:

Number of Credit	Conversion Calculation	Description
1 Credit	= 170 minutes / week / semester = 170 minutes x 14 weeks = 2,380 minutes = 39.7 hours	1. One (1) credit hour of teaching and learning activities consists of lectures, structured assignments, and independent activities with the following breakdown: a. Lecture: 50 ((fifty) minutes per week per semester. b. Structured assignments: 60 (sixty) minutes per week per semester. c. Independent activities: 60 (sixty) minutes per week per semester. 2. One semester consists of 16 weeks, including 2 weeks for mid-term and final examinations.
	= 39.7 hours / 25 hours = 1.6 ECTS	- 1 semester consists of 2 quarters. - 1 quarter = 12.5 – 15 ECTS, so it is set at 1 quarter = 15 ECTS as the maximum standard. - 1 ECTS = 25 – 30 hours, so it is set at 1 ECTS = 25 hours as the maximum standard.
144 Credits	= 144 X 1.6 ECTS = 230.4 ECTS	- Minimum curricular activities = 144 credits.
The Bachelor's program requires a minimum of 144 credits, which is equivalent to 230.4 ECTS.		

b. For the Master's Program, the conversion of credits to ECTS follows the following provisions:

Number of Credit	Conversion Calculation	Description
1 Credit	= 290 minutes / week / semester = 290 minutes x 14 weeks = 4060 minutes = 67.67 hours	1. One (1) credit for learning and teaching is in the form of lectures, structured assignments, and independent activities with the following details: a. Learning and teaching activities (lectures): 50 (fifty) minutes per week per semester; b. Structured assignment activities: 120 (one hundred and twenty) minutes per week per semester; and c. Independent activities: 120 (one hundred and twenty) minutes per week per semester. **2.** One semester = 16 weeks, including 2 weeks for mid-semester and final exams.
	= 67.67 hours / 25 hours = 2.7 ECTS	- 1 semester consists of 2 quarters. - 1 quarter = 12.5 – 15 ECTS, so 1 quarter is set as a maximum of 15 ECTS. - 1 ECTS = 25 – 30 hours, so 1 ECTS is set as a maximum of 25 hours.
36 Credits	= 36 x 2.7 ECTS = 97.44 ECTS	- Minimum curriculum activities = 36 credits (Based on Indonesia NQF)
The Master's program has a minimum of 36 credits, which is equivalent to 97.44 ECTS.		

Stipulated in : Banda Aceh
On the Date of : September 19, 2022

RECTOR OF UNIVERSITAS SYIAH KUALA

Digitally Signed

Prof. Dr. Ir. Marwan
Official Reg. No. 196612241992031003