2023/2024 | 1

PEDOMAN
KURIKULUM

PROGRAM STUDI
TEKNOLOGI PANGAN

FAKULTAS TEKNIK DAN SAINS
Universitas Pembangunan Nasional "Veteran" Jawa Timur

FOREWORD

The curriculum is one of the important components in the education process. The quality of the curriculum will determine the competence of graduates. Without a curriculum, the learning process cannot take place. Therefore, its existence requires dynamic design, implementation and evaluation in accordance with the times, the needs of Science, Technology and Art (IPTEKS) and the competencies needed by the community and users of university graduates. Currently, the development of science and technology is very fast, therefore a Study Program Curriculum Document is needed. This Curriculum Guideline is prepared in an effort to support teaching and learning activities in the Food Technology Study Program (PS- TP).

In order to prepare graduates who are resilient in facing social, cultural, world of work, and technological changes that are growing rapidly in the era of the industrial revolution 4.0, student competencies must be strengthened in accordance with existing developments. It is necessary to have a link and match between higher education graduates not only with the business world and the industrial world but also with the future which is changing faster. Based on this, the Faculty of Engineering Study Program, National Development University "Veteran" East Java developed the MBKM Curriculum in accordance with the new policy of the Ministry of Education and Culture in the field of higher education through the "Merdeka Belajar - Kampus Merdeka (MBKM) program. The policy of the Ministry of Education, Culture Research and Higher Education is related to providing freedom for students to take part in learning activities for a maximum of three semesters of study outside their study program and campus.

The MBKM policy provides opportunities for students to gain broader learning experiences and new competencies through several learning activities including student exchanges, internships/practical work, research, independent projects, entrepreneurial activities, humanitarian projects, school teaching, and village projects/thematic real work courses. In addition, students are also given the freedom to take part in learning activities outside their study program in the same university with the same SKS weight.

certain. All of these activities can be carried out by students with the guidance of lecturers and a cooperation agreement is required if carried out with parties outside the study program.

The contents of this curriculum document book consist of 6 chapters starting with Introduction, Curriculum Preparation Process & Learning Outcomes, Science Groups, Courses & Study Materials, Merdeka Learning-Campus Merdeka, Learning Signs & Assessment System, and Curriculum & Learning Evaluation. With the publication of this Curriculum Document Book, it is hoped that it can provide clear and correct information to the academic community about the Food Technology Study Program, Faculty of Engineering, National Development University "Veteran" East Java.

To all those who have helped in the preparation of this Curriculum Document Book, especially to the drafting team, we would like to thank you. We hope that all of these explanations will be useful for UPN "Veteran" East Java and the teaching-education process in the Food Technology Study Program. Perfection belongs only to God, if there are mistakes and shortcomings in the preparation of this Curriculum Book, we ask for forgiveness.

Surabaya, November 2023

Curriculum Team of Food
Technology Study Program
Faculty of Engineering
UPN "Veteran" Jawa Timur

APPROVAL SHEET (LEMBAR PENGESAHAN)

ENGINEERING FACULTY UPN "VETERAN" JAWA TIMUR	NO	
	PRODUCED DATE	June 2023
	REVISION DATE	-
	EFFECTIVE USED DATE	June 2024
	MADE BY	Curriculum Team Food Technology Department UPN "Veteran" Jawa Timur **Riski Ayu Anggreini., S.TP., M.Sc** NPT. 17219900427065
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LEGAL BASED/REFERRENCE	IMPLEMENTING QUALIFICATION
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. Peraturan Presiden Republik Indonesia Nomor 8 Tahun 2012 Tentang Kerangka Kualifikasi Nasional Indonesia 4. Peraturan Menteri Riset, Teknologi, dan Pendidikan Tinggi Republik Indonesia Nomor 38 Tahun 2015 tentang Organisasi	1. Understand the duties and functions of the work unit 2. Understand the relevant regulations 3. Have high intensity 4. Able to operate the system according to related tasks

Dan Tata Kerja Universitas Pembangunan Nasional "Veteran" Jawa Timur 5. Peraturan Menteri Riset, Teknologi, dan Pendidikan Tinggi Republik Indonesia Nomor 86 Tahun 2017 tentang Statuta Universitas Pembangunan Nasional "Veteran" Jawa Timur 6. Peraturan Menteri Pendidikan dan Kebudayaan No. 3 Tahun 2020 tentang Standar Nasional Pendidikan Tinggi 7. Peraturan Menteri Pendidikan dan Kebudayaan No. 22 Tahun 2020 tentang Rencana Strategis Kementerian Pendidikan dan Kebudayaan Tahun 2020-2024 8. Peraturan Menteri Desa, Pembangunan Daerah Tertinggal, dan Transmigrasi Nomor 17 Tahun 2019, tentang Pedoman Umum Pembangunan dan Pemberdayaan Masyarakat Desa 9. Peraturan Menteri Desa, Pembangunan Daerah Tertinggal, dan Transmigrasi Nomor 17 Tahun 2019, tentang Pedoman Umum Pembangunan dan Pemberdayaan Masyarakat Desa 10. Renstra Universitas Pembangunan Nasional "Veteran" Jawa Timur Tahun 2020-2024. 11. Keputusan Rektor UPN "Veteran" Jawa Timur No. KEP/155/UN.63/2019 tentang Standar Pendidikan Tinggi Bidang Akademik UPN "Veteran" Jawa Timur 12. Keputusan Rektor UPN "Veteran" Jawa Timur No. 166/UN.63/TU/2020 tentang Tim Implementasi Pembelajaran Merdeka Belajar -Kampus Merdeka di UPN "Veteran" Jawa Timur 13. Panduan Implementasi Pembelajaran Merdeka Belajar - Kampus Merdeka di UPN "Veteran" Jawa Timur	

East Java

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INTRODUCTION

12.1 HISTORY OF THE ESTABLISHMENT OF THE STUDY PROGRAM

The Food Technology Study Program is under the Faculty of Engineering - National Development University "Veteran" East Java. The basis for the establishment was based on the Rector's Decree No. SKEP/254/VII/1993 and ratified by the Joint Decree of the Indonesian Minister of Education and Culture and the Indonesian Minister of Defense and Security No. Kep/0307/U/1994 - 10/XI/1994 dated November 29, 1994. In 1995, the Food Technology Study Program obtained registered status based on the Decree of the Director General of Higher Education of the Ministry of Education and Culture No. 024/Dikti/Kep/1995 and based on the Decree of BAN-PT of the Ministry of Education and Culture of the Republic of Indonesia No. 0444/AK-I-III-033/UPNPA/XI/2000, dated November 23, 2000 the Food Technology Study Program was accredited (B). Since January 26, 2006, based on the Decree of BAN-PT Depdiknas RI No. 028/BAN-PT/Ak- IX/S1/I/2006, the Food Technology Study Program has been accredited (A) for 5 years from the date of determination. Since January 21, 2008 with No. 355/D/T/2008 the Food Technology Study Program has received an extension of the operational permit under the Faculty of Industrial Technology. In 2011, it has obtained an operational permit from BAN-PT and in 2016 the Food Technology Study Program received an Accreditation score of B. Then in 2018 conducted re-accreditation, with an accreditation score of B.

The Food Technology Study Program has a cumulative study load of at least 145 credits with a standard cumulative length of study, 8 to 14 semesters. The scientific specifications provided include an understanding of agricultural products as biological materials, knowledge of t h e main types of processes in converting biological materials into commodities, knowledge of processing tools and machinery, the ability to discuss problems in commodity processing aspects, the ability to carry out process engineering for new products and how to operate processing units as systems and optimization of food quality assurance systems and food safety.

Along with technological advances, social and cultural developments, and the needs of the world of work, student competencies must be prepared to meet

the needs of the current and future times. In this regard, the current link and match does not only need to be adjusted between the world and the workplace.

industry with the world of work, but also with future needs that can change rapidly. Therefore, the Food Technology Study Program of UPN "Veteran" East Java, since FY 2020/2021 has implemented the MBKM curriculum, based on Permendikbud Number 3 of 2020 concerning the implementation of the Merdeka Learning Campus Merdeka curriculum. Through the MBKM curriculum, PS-TP has carried out several forms of activities such as student exchange programs through PERMADI, PERMATA SAKTI, and PERMATA PANGAN, Entrepreneurship Internships, Independent Studies, KKN-Tematik, Village Development and Certified Internships at Industry Partners and DUDI (World of Business and Industry).

12.2 VISION AND MISSION OF THE STUDY PROGRAM

12.2.1 Vision

To become a superior study program in the field of food technology and industry based on local resources that is recognized nationally and internationally, and has the character of State Defense in 2029.

12.2.2 Mission

1. Organizing education and developing human resources who are competent in the field of food technology and industry, have an entrepreneurial spirit, and uphold the values of state defense.
2. Carry out research, development, and application of food technology innovations that fulfill health and food safety aspects made from local resources with national and international quality standards.
3. Carry out community service in the form of teaching, training, and dissemination of research results based on food technology science that utilizes local resources as much as possible.
4. Enhance strategic cooperation between academia, society, government, and national and international food industry sectors.

12.3 Study Program Objectives

Table 1. Educational Objectives of Food Technology Study Program

Code	Description of Study Program Education Objectives (TPP)
TPP-1	Producing graduates who are competent in the field of food technology and industry, have an entrepreneurial spirit, and uphold values. the value of national defense
TPP-2	Producing graduates who are able to carry out research, development, and application of food technology innovations that fulfill aspects of health and food safety made from local resources with national and regional quality standards international
TPP-3	Producing graduates who are able to carry out community service in the form of teaching, training, and dissemination of research results based on scientific technology. food that utilizes local resources as much as possible
TPP-4	Producing graduates who are able to communicate effectively and establish cooperation in the community, government, and national and international food industry sectors in building the food industry. partnerships in the field of food technology

12.4GRADUATE COMPETENCIES

12.4.1 Graduate Profile

Graduates of undergraduate education programs in food science and technology can work in fields related to the application of food science and technology, including the food industry (small, medium or large), upstream agro-industry, food machinery industry, culinary industry, food distribution and ingredient industry, packaging industry, research institutions, educational institutions, financial institutions, bureaucracy (government agencies), and so on. Among the employment areas of food science and technology graduates in the food industry are in the areas of production, new product development, food quality assurance and control, regulation, warehousing, purchasing/procurement, marketing, food processing machinery, and so on. Among the areas of work in government agencies are in the formulation of food policies, supervision, and guidance / counseling of the food industry. Graduates can also continue their education at the master's level or become entrepreneurs.

in the field of food. The study program should formulate a characteristic graduate profile, which is reflected in the structure of the curriculum.

Table 2 Graduate Profile and Graduate Profile Description

No.	Graduate Profile	Graduate Profile Description
1	PL-1: Expert	- Food Technologist - Food Safety Expert - Food Industry Consultant
2	PL-2: Food Industry	- Supervisor - Quality Control and Quality Assurance Staff - Research and Development Staff - Sales and Marketing
3	PL-3: Government Employee	- Civil Servant - Employees at Government Agencies such as BPOM, BSN, and BRIN - Policymakers - Staff at SOE - Food Facilitator
4	PL-4: Academics	- Teacher at Vocational school - Laboratory Assistant
5	PL-5: Self-employed	- Entrepreneur

Table 3 Correlation of Graduate Profile and Educational Objectives of Study Programs

No.	Graduate Profile (PL)	Study Program Education Objectives (TPP)			
		TPP-1	TPP-2	TPP-3	TPP-4
1	PL-1	✓	✓		
2	PL-2		✓		✓
3	PL-3		✓	✓	
4	PL-4			✓	✓
5	PL-5	✓			✓

12.4.2 Competencies and Learning Outcomes

With reference to the formulation of the general description of KKNI level six (Presidential Regulation Number 8 of 2012), graduates of undergraduate education programs in the field of food science and technology must meet three aspects of competence, namely mastery of general and specific knowledge / science; general and specific work skills / skills; and aspects of attitude and responsibility. The general work ability/skills and attitude/responsibility aspects of graduates of undergraduate education programs refer to Permendikbud Number 3 of 2020. Aspects of mastery of specific knowledge/science and specific work abilities/skills), as well as attitudes and responsibilities for graduates of undergraduate education programs in the field of food science and technology are presented in Table 1. These graduate competencies are further formulated in the Graduate Learning Outcomes (LLOs). Study programs can modify or add to the formulation of these ELOs which are adjusted to the distinctiveness that they want to realize according to the policies of their respective universities, as well as the vision, mission and objectives of the study program This section describes the competencies of graduates containing statements of graduate profiles and Graduate Learning Outcomes.

CHAP
TER 2 CURRICULUM DEVELOPMENT PROCESS & LEARNING OUTCOMES

In order to realize the quality and identity of the Indonesian nation related to the education and training system, as well as the national human resource improvement program, PS-TP prepares the 2022 Curriculum Guidelines to achieve the Vision and Mission of the Study Program through the stages of the curriculum preparation process and refers to several basic policies from the government. *The* higher education system in Indonesia has four main stages, namely (1) *Input*; (2) *Process*; (3) *Output*; and (4) *Outcomes.* A good learning process has good elements in several ways, namely: (1) clear learning outcomes; (2) healthy HEI organization; (3) transparent and accountable HEI management; (4) availability of HEI learning designs in the form of clear curriculum documents and according to labor market needs; (5) the ability and skills of reliable and professional academic and non-academic human resources; (6) availability of adequate infrastructure and learning facilities. By having these six elements, universities will be able to develop a healthy academic climate, and lead to the achievement of a professional academic community.

In its development, the achievement of academic climate and society is guaranteed internally by the Higher Education. Therefore, the government through the Ministry of Research, Technology and Higher Education requires that universities must carry out a quality assurance process consistently and correctly in order to produce good graduates. After going through a good learning process, it is expected that quality higher education graduates will be produced. Some indicators that are often used to assess the success of higher education graduates are (1) GPA; (2) length of study and (3) predicate of graduation. However, this process does not stop here. To achieve success, universities need to ensure that their graduates can be absorbed in the job market. The success of Higher Education is to be able to deliver its graduates to be absorbed and recognized by the labor market and society.

2.1 FOUNDATION OF CURRICULUM DEVELOPMENT

Curriculum design, lecture materials, teaching and learning processes and management of the academic atmosphere refer to the vision, mission, goals and objectives that have been set, and are guided by:

(i) Decree of the Minister of Education No. 045/U/2002 on the Core Curriculum of Competency-Based Higher Education;

(ii) Permendikbud No. 49 of 2014, concerning National Higher Education Standards, which was updated with Permenristekdikti No. 44 of 2015, concerning National Higher Education Standards;

(iii) Competency Standards for Food Science and Technology Curriculum according to the Indonesian National Qualifications Framework (KKNI)

(iv) The Education Standards for Bachelor of Food Technology / Agricultural Product Technology formulated by the Indonesian Food Technology Expert Association (PATPI) are mapped into a graduate profile that contains the following competencies: attitudes, main competencies, special competencies, and knowledge.

(v) Renstra of Universitas Pembangunan Nasional "Veteran" East Java, 2020-2024

(vi) Renstra of Faculty of Engineering, Universitas Pembangunan Nasional "Veteran" East Java Year 2020-2024

(vii) Strategic Plan of TP Study Program, Faculty of Engineering, Universitas Pembangunan Nasional "Veteran" East Java Year 2020-2024

Sociologically, TP Study Program is one of the higher education *stakeholders* in its field which cannot be separated from the influence of other *stakeholder* components which include:

(i) The TP Study Program academic community includes the management of the study program to the Rectorate which has a role in determining the direction and development of the TP Study Program curriculum;

(ii) Regional, national, and even international food and/or agricultural product technology professional organizations;

(iii) TP Study Program alumni who have experience in the world of work and in the community in implementing science and technology, especially in the field of food technology;

(iv) Users are mainly private and government-owned industries related to the field of food technology;
(v) Users from government departments and non-departments related to the field of food technology
(vi) Society at general who have interests with the implementation of food science and technology;

The Food Technology study program in accordance with its vision and mission is committed to producing graduates who excel in the field of food technology and industry and have the character of state defense so that the curriculum that is built contains these values as the main characteristics of study program graduates. The curriculum is prepared in reference to the Education Standards for Bachelor of Food Technology / Agricultural Product Technology formulated by the Indonesian Food Technologists Association (PATPI) through Decree No. 03 / SK-Patpi / XII / 2013 (updated in 2022) concerning Education Standards for Bachelor of Food Technology / Agricultural Product Technology and government policies through Presidential Decree No. 8 / 2012 dated January 17, 2012 concerning equalization between graduate qualifications and the Indonesian National Qualifications Framework (KKNI). The curriculum also refers to the policies and directions set by the University through the Rector's Decree Number: SK/67/IX/2014. After that, the curriculum review was carried out in 2016, 2019 and 2021 based on KKNI.

UPN Veteran East Java establishes a policy/standard regulatory reference that is used as an educational reference through the SPMI Standard Document. The document is used as a reference basis for improving the activities of the Tridarma PT, which is then followed up in the form of a strategic plan (Renstra) or operational plan (Renop) both at the university level and the work unit level.

2.2 LEARNING OUTCOME MECHANISM BASED ON SKKNI-PATPI

The learning outcomes of the Prodi curriculum are based on the Education Standards set by the government. This education standard is the minimum standard for the field of food science and technology at the undergraduate level, which includes graduate competency standards, content standards, learning process standards, standards for educators and education personnel, facilities standards.

and infrastructure, management standards and financing standards with reference to Permendikbud Number 3 of 2020 concerning SNPT.

With reference to the formulation of the general description of KKNI level six (Presidential Regulation Number 8 of 2012), graduates of undergraduate education programs in the field of food science and technology must meet three aspects of competence, namely aspects of general and specific work skills; aspects of mastery of general and specific knowledge / science; and attitudinal aspects. The attitudinal aspects, and general skills of graduates of undergraduate education programs refer to Permendikbud Number 3 of 2020.

Table 4 Specific competencies of graduates of undergraduate education programs in food science and technology in accordance with KKNI level six.

Competency Aspect	Graduate Competencies
Knowledge/science	Mastering knowledge of food science principles (food chemistry and analysis, food microbiology, food safety, food processing engineering, food biochemistry, nutrition and health) to be formulated in integrated food process design techniques.
Specialized employability (skills)	Able to apply the principles of food science and technology in the process of adding value to food ingredients to produce safe, nutritious and quality food products.
Attitude and Responsibility	Able to think critically and analytically, make decisions, be responsible for their work independently, work in teams, interact with people from different backgrounds, be skilled in organizing and leading in various situations, communicate orally and in writing about technical and non-technical aspects, utilize information sources, and have a commitment to professionalism and leadership. ethical values.

2.3. LEARNING OUTCOMES

The Core Learning Outcomes formulated in Table 5 are the minimum abilities (knowledge; skills; life skills, ethics and professionalism) for graduates of undergraduate education programs in food science and technology. The verbs used in the Core Learning Outcomes statement indicate the minimum abilities that must be mastered by students. Study programs can modify the statement of learning outcomes at a higher cognitive or skill level by using Bloom's Taxonomy approach or other appropriate approaches. Study programs can also modify or add Core Learning Outcomes as a characteristic, which is in accordance with the vision, mission and objectives of the study program. The formulation of Core Learning Outcomes by study programs needs to consider input from internal and external stakeholders.

Additional learning outcomes include study materials including (a) data literacy, the ability to read, analyze, and use data; (b) technological literacy, the ability to understand how machines work; (c) human literacy, the ability to understand humanities, communication and design; (d) skills that foster high order thinking skills (HOTS) which include *communication, collaboration, critical thinking, creative,* and *thinking*; (e) understanding of knowledge to be practiced for the common good locally, nationally, and globally; and (f) additional learning outcomes and competencies that can be obtained outside the study program through the MBKM program.

Table 5 Graduate Learning Outcomes (SLOs)

Code	Description of Graduate Learning Outcomes (SLOs)
CPL-1	Able to master the principles of food science (food chemistry and analysis, food microbiology, food safety, f o o d engineering and processing, food biochemistry, nutrition and health, and food science). applied).
CPL-2	Able to apply the principles of food science in an integrated manner in the process of food production on an industrial scale to produce safe and quality innovative food.
CPL-3	Able to communicate orally and in writing, work in a team, interact with others from different backgrounds, skillfully in organizing and leading in various situations

CPL-4	Able to think critically and analytically, solve problems, take responsibility for their work independently, and make informed decisions. that can be accounted for
CPL-5	Commitment to ethical, moral and martial character values country as a food professional
CPL-6	Able to capture and utilize business/business opportunities and apply process engineering in the food processing industry, utilize information sources, and be professional and knowledgeable. committed to ethical values

Table 6. Matrix of the relationship between learning outcomes of study program graduates and educational objectives of study programs

Code	Description of Study Program SLOs	TPP-1	TPP-2	TPP-3	TPP-4
CPL-1	Able to master the principles of food science (food chemistry and analysis, food microbiology, food safety, food engineering and processing, food biochemistry, nutrition and health, and science). applied food).	✓	✓		
CPL-2	Able to apply the principles of food science in an integrated manner in the food production process on an industrial scale to produce innovative food. safe and quality	✓	✓		
CPL-3	Able to communicate orally and in writing, work in a team, interact with others from different backgrounds, skilled in organization. and lead in various situations			✓	✓
CPL-4	Able to think critically and analytically, solve problems, take responsibility for their work independently, and make appropriate decisions based on information. problems, take responsibility for their work independently, and make decisions appropriately based on information that can accounted for	✓	✓		

CPL-5	Having a commitment to ethical values, morals and character of state defense as a professional in the field of food	✓			✓
CPL-6	Able to capture and utilize business/enterprise opportunities and implement them process engineering of the agricultural products processing industry, utilizing sources-	✓	✓		
	information sources, as well as being professional and committed to ethical values				

2.3 CORE STUDY MATERIAL

The core study materials are grouped into seven categories, namely (1) Chemistry *and* analysis of food components *(food chemistry and analysis), (2)* Food *microbiology* (*food microbiology);* (3) Food *safety, (*4) Food *processing* and *engineering, (*5) Food *biochemistry*, nutrition *and* health*,* (6) *Applied food science, and (*7) Life *skills*, *attitude and professionalism.* These Core Learning Outcomes become a reference in developing Course Learning Outcomes (CPMK).

Table 7 Study materials, minimum study material coverage, *essential learning outcomes* and Bloom's taxonomy level *(*LTB)

Study Material	Minimum Coverage of Study Materials	Code	After completing education bachelor of science and technology food, students are able to	LTB [1]
Chemistry and Analysis Component Food (BK-1)	Chemical structure, role and component properties food (water, carbohydrates, proteins, oil/fat, micro components (vitamins, minerals, toxic components and bioactive components, and additional ingredients food); change chemistry that occurs during the process Processing, storage, and use and influence on characteristics and age	1.1	Explaining the structure chemistry of food components, functions, and chemical reactions The main ones that involving it, as well as relationship with material characteristics and food products.	C2
		1.2	Apply the principles of food chemistry in chemical reaction control that happens inside food ingredients.	C3
		1.3	Describe the main chemical reactions that affecting damage and limiting the lifespan store materials and products	C2

	shelf life of food products; methods of proximate analysis of food components (theory and practice), and principles of instrumentation analysis (spectroscopy and chromatography).		Food.	
		1.4	Explain the technical principles and methods of chemical analysis of food components.	C2
		1.5	Skilled in performing basic chemical analysis techniques and applied chemistry on materials Food.	C4
Study Material	**Minimum Coverage of Study Materials**	**Code**	**After completing education bachelor of science and technology food, students are able to**	**LTB [1]**
		1.6	Select chemical analysis techniques that are appropriate to the characteristics of the material and the needs of the analysis objective.	C4
Food Microbiology and Processing (BK-2)	Damage to foodstuffs by microorganisms; internal and external factors that affect their growth, survival, and control; application of the principles of food preservation and processing involving microorganisms; qualitative and quantitative methods of microbiological analysis; utilization of microorganisms for the food industry.	2.1	Identify the types of microorganisms in food that are useful, pathogenic and cause spoilage, and their growth conditions.	C2
		2.2	Describe appropriate conditions for killing or controlling spoilage and pathogenic microbes in food.	C2
		2.3	Explain the influence of environmental conditions (internal and external) on adaptability, growth, and adaptation. and microbial inactivation.	C2
		2.4	Apply the principles of preservation (traditional and modern; thermal and non-thermal) and food processing through involving microorganisms (process of fermentation).	C3
		2.5	Applying microbiological analysis methods to identify microorganisms in Food.	C3

		2.6	Selecting microbiological analysis methods suitable for identifying microbes in food.	C4
		2.7	Utilization of microorganisms for the food industry	C6
Food Safety (BK-3)	Principles of food safety; microbiological, chemical and physical hazards; sanitation and hygiene practices for	3.1	Explain the occurrence of food contamination caused by microbiological, chemical and physical contamination.	C2
Study Material	**Minimum Coverage of Study Materials**	**Code**	**After completing education bachelor of science and technology food, students are able to**	**LTB [1]**
	control of pathogenic microbes in food production; sampling techniques for food safety, and food safety systems (PRP, GMP, SSOP, HACCP, ISO, FSMS).	3.2	Evaluate appropriate conditions (including sanitation and hygiene practices) to control microbial pathogens and spoilage. in food production.	C2
		3.3	Explain and evaluate microbiological criteria in food based on collection techniques suitable example	C4
		3.4	Develop a plan for a food safety system in a food industry.	C5
Food Processing Engineering and Processes (BK-4)	Principles of food engineering (transport processes, fluid flow, heat transfer and mass transfer, thermodynamics, principles of mass and energy equilibrium, separation processes, modeling and simulation), principles of food processing (unit operations and food processing equipment), knowledge of raw materials and their influence on food processing operations, food plant design (process control and	4.1	Explain the principles of food engineering (heat and mass transfer, fluid flow, and thermodynamics).	C2
		4.2	Formulate mass and energy balance in a food production process.	C4
		4.3	Explain the sources and diversity of food raw materials and their effect on operations food processing.	C2
		4.4	Designing production processes on an industrial scale to produce products safe and quality food.	C4

	automation) and utilities (refrigeration, steam, water and waste handling, and electricity).	4.5	Use unit operations and food processing equipment to produce a food product at laboratory or pilot plant scale.	C3
		4.6	Explain the effect of preservation and processing methods on the quality of food products.	C2
Study Material	**Minimum Coverage of Study Materials**	**Code**	**After completing education bachelor of science and technology food, students are able to**	**LTB [1]**
		4.7	Select the type of food packaging and packaging methods that are appropriate to the nature of the food, process conditions and food safety. Storage.	C4
		4.8	Explain the principles and practices of cleaning and sanitizing food processing facilities.	C2
		4.9	Explaining the principles and methods of water treatment for food processing, and handling of waste from food processing.	C2
Biochemistry of Food, Nutrition and Health (BK-5)	Principles of biochemistry (basic concepts of the relationship between biochemical structure and function, reactivity, and thermodynamics), basic principles of food nutritional value and metabolism of essential nutrients (nutrient components and bioactive components needed by humans, digestive system, absorption, metabolism, interactions and function of nutrients, needs nutrition and energy, and nutrient deficiencies), basic concepts of nutrition	5.1	Explain biochemical processes, basic concepts of nutrition science and the relationship between food consumption and nutritional status.	C2
		5.2	Connect the function of food (nutrients and bioactive components) to human health (excess or deficiency). malnutrition).	C3
		5.3	Explain the biological role of food (nutrients and bioactive components), and the positive and negative effects of consuming food in its natural and processed forms on the body.	C2

	and the relationship between food consumption and nutritional status, the role of nutrients and bioactive compounds, and the effects of food consumption on nutritional status. health, functionality of food components and commonly used laboratory techniques in applied biochemistry and biological assays, and the effect of processing and		Health.	
		5.4	Describe changes in nutrients during processing and storage.	C2
		5.5	Apply basic laboratory techniques in biochemical analysis and biological value of food components.	C3
Study Material	**Minimum Coverage of Study Materials**	**Code**	**After completing education bachelor of science and technology food, students are able to**	**LTB [1]**
	storage on nutrient changes.			
Applied Food Science (BK-6)				
Sensory Science	Physiological and psychological basis of sensory testing, sensory testing methods for assessing food sensory properties, and experimental design and statistical methods in sensory testing.	6.1.1	Explain the basic physiology and psychology of sensory testing.	C2
		6.1.2	Applying experimental design and statistical methods for application in the sensory test.	C3
		6.1.3	Select appropriate sensory test methods to solve problems related to food products.	C4

Food Quality Assurance Management	Principles of food quality assurance and control, food quality assurance system, halal assurance system, and their application in the food industry.	6.2.1	Explain the terminology of quality, food quality assurance and control.	C2
		6.2.2	Apply the principles of quality assurance and control in the food industry.	C3
		6.2.3	Implement certain food product standards and specifications.	C3
		6.2.4	Evaluate the application of food quality control systems (e.g: *Statistical process control*).	C5
Food Regulation and Legislation	Regulations related to the production and marketing process of food products (food security and safety, national food supervision management system, food labeling, production) halal food, ingredients	6.3.1	Describe the government regulatory framework required in the production and marketing of food products.	C2
		6.3.2	Describe the policy formulation process and regulations in the food sector.	C2
Study Material	**Minimum Coverage of Study Materials**	**Code**	**After completing education bachelor of science and technology food, students are able to**	**LTB [1]**
	food additives and food contaminants, and other technical regulations), formulation mechanisms national regulations, and the introduction of the Codex Alimentarius Commission and its role	6.3.3	Apply applicable food rules and regulations according to the context.	C3
		6.3.4	Analyze a particular case and relate it to the regulations and applicable food regulations.	C4
Life Skills, Ethics and Professionalism (BK-7)				
Oral and Written Communication	Communication techniques to convey technical and non-technical ideas in scientific forums in writing, orally and visually	7.1.1	Write a technical paper that is appropriate to the context of the problem being studied.	C4
		7.1.2	Demonstrate oral presentation in a scientific forum.	C4
		7.1.3	Prepare visual information materials related to food science for diverse audiences.	C4

Critical Thinking and Problem Solving	Scientific reasoning and problem solving related to technical aspects for exercise analytical power and critical and decision-making skills	7.2.1	Utilize sources of information and scientific evidence.	C3
		7.2.2	Apply critical and analytical thinking skills to solve problems and make decisions.	C3
		7.2.3	Apply the principles of food science in problems practical and real situations encountered.	C4
		7.2.4	Select appropriate analysis techniques when faced with practical/real problems.	C4
		7.2.5	Evaluate scientific evidence and process it into information to make conclusions or decisions.	C5
Professionalism and Leadership	Organization and management projects; skills that required for	7.3.1	Demonstrate the ability to work independently and in a team environment. team, as well as leading in a group.	C4
Study Material	**Minimum Coverage of Study Materials**	**Code**	**After completing education bachelor of science and technology food, students are able to**	**LTB [1]**
	working in a team, interacting with individuals from different backgrounds and leading in groups, time management skills and working under conditions stressed, professional ethics in the food sector	7.3.2	Carry out tasks/projects with good time management to achieve goals/targets. set.	C3
		7.3.3	Demonstrate social and cultural skills in a diverse society.	C3
		7.3.4	Describe examples related to professionalism and ethics in the field of food science.	C3

[1]LTB (Bloom's Taxonomy Levels): knowledge (C1), understanding (C2), application (C3), Analysis (C4), Evaluation (C5) and Synthesis (C6s)

Table 8. Study material relationship matrix based on graduate learning outcomes

CPL	SLO Description	Study Material (BK)						
		BK -1	BK -2	BK -3	BK-4	BK-5	BK -6	BK -7

CPL-1	Able to master the principles of food science (food chemistry and analysis, food microbiology, food safety, food engineering and processing, food biochemistry, nutrition and health, and applied food science).	✓	✓	✓	✓	✓	✓	
SLO-2	Able to apply food science principles in an integrated manner in the food production process on an industrial scale to produce safe and quality innovative food.			✓				
SLO-3	Able to communicate orally and in writing, work in teams, interact with others from different backgrounds, skilled in organizing and leading in various situations.							✓
SLO-4	Able to think critically and analytically, solve problems, take responsibility for their work independently, and make informed decisions based on reliable information.							✓
SLO-5	Have a commitment to ethical values, morals and national defense character as a professional in the field of food.							✓
SLO-6	Able to capture and utilize busines s opportunities and apply process engineering in the agricultural product processing industry, utilize information sources, and be professional and committed to ethical values.							✓

2.5 STANDARD ACHIEVEMENT STRATEGY

Learning content standards contained in SPMI are used to achieve academic standards as stated in the Quality Manual document for Learning content

standards. The following are some of the efforts that have been made: curriculum *review* facilitated by UPPS, updating learning tools, at the end of the semester a lecturer plotting meeting is held according to competence. There are libraries at the university level and reading rooms at the faculty level, laboratory support to support the implementation of education, available roadmap documents that accommodate community service and research activities and the support of internal and external grants for both research and community service. Facilitation of online lecture learning facilities for lecturers. Facilitation of incentives in making learning videos.

The study program strategy to achieve an increase in the quality of graduates produced, through:

- Improved quality of the learning process.
- Improving the quality of the final project mentoring process.

- Improving the relevance of the curriculum to the needs of graduate users.
- The cultivation of foreign values through curricular and extra-curricular activities.

CHAPTER 3
CLUSTERS OF KNOWLEDGE, COURSES AND MATERIALS

3.1 CLUSTERS OF KNOWLEDGE AND GROUPING OF LECTURERS' EXPERTISE

The Food Technology Study Program (PS-TP) of UPN Veteran East Java currently has a total of 19 lecturers who are divided into 5 (four) groups of expertise / clumps of knowledge, namely food chemistry and analysis, biochemistry and food nutrition, microbiology and food safety, food process engineering, and applied food science. The list of lecturers and their expertise groups can be seen in the table below.

Table 9: Group of Lecturers based on Expertise Group

No.	Specialty Group	Lecturer Name
1	**Food Chemistry and Analysis**	**Coordinator:** Dr. Dedin F. Rosida, S.TP, M.Kes **Member:** - Ir. Ulya Sarofa, MM - Dr. Yushinta A. Sanjaya, S.Pi, MP
2	**Biochemistry and Food Nutrition**	**Coordinator:** - Dr. drh. Ratna Yulistiani, MP **Member:** - Riski Ayu A, S.TP, M.Sc - Dr. Yunita Satya P, SP, M.Kes - Dr. Dina Mustika Rini, S.TP, M.Sc
3	**Microbiology and Food Safety**	**Coordinator:** Prof. Dr. Ir. Sri Winarti, MP **Member:** - Anugerah Dany, S.TP, M.Sc, M.P - Dr. Muhammad Alfid K, S.Pi, M.Si - Rahmawati, S.Pi, M.Sc
4	**Food Process Engineering**	**Coordinator:** Dr. Rosida, S.TP, MP **Member:** - Luqman A. W, S.TP, MP - Andre Yusuf T.P., S.TP, M.Sc
5	**Applied Food Science**	**Coordinator:** Prof. Dr. Dra. Jariyah, MP **Member:** - Dr. Hadi Munarko, S.TP, M.Si. - Ifwarisan Defri, S.TP, M.Si,

3.2 LIST AND CLASSIFICATION OF COURSES

Table 10 List of courses and course classification

SEMESTER 1

Code Lama	Code New	Course Content	SKS			W/P	Type MK	Realm Science	Prerequisites
			T	P	J				
UV141111	-	English	3	0	3	W	MKU	-	-
UV141107	-	Pancasila Education	2	0	2	W	MKU	-	-
TP141104	TP231101	Advanced Chemistry / Chemistry Inorganic	2	0	2	W	MK-PS	KAP	-
FT141101	-	Calculus I	3	0	3	W	MKF	-	-
FT141103	-	Physics	3	0	3	W	MKF	-	-
FT141104	-	Basic Chemistry / Chemistry Organic	2	1	3	W	MKF	-	-
TP141101	TP2313101	Biology	2	1	3	W	MK-PS	MKP	-
		TOTAL	18	2	19				

SEMESTER 2

Code Lama	Code New	Course Content	SKS			W/P	Type MK	Realm Science	Prerequisites
			T	P	J				
UV141109	-	Bahasa Indonesia	2	0	2	W	MKU	-	-
UV141108	-	Citizenship	2	0	2	W	MKU	-	-
FT141102	-	Calculus II	3	0	3	W	MKF	-	-
UV141101 UV141102 UV141103 UV141104 UV141105 UV141106	-	Islam Religion Christianity Religion Catholicism Religion Hinduism Religion Buddhism Khong Hu Cu religion	2	0	2	W	MKU	-	-
TP141102	TP231302	General Microbiology	3	0	3	W	MK-PS	MKP	TP141101
TP141103	TP231501	Introduction to Technology Food	2	0	2	W	MK-PS	IPT	-
TP141105	TP231102	Material Knowledge Food	3	1	4	W	MK-PS	KAP	-
TP141109	TP231103	Physical Chemistry and Colloids	2	0	2	W	MK-PS	KAP	-
		TOTAL	21	1	20				

SEMESTER 3

Code Lama	Code New	Course Content	SKS			W/P	Type MK	Realm Science	Prerequisites
			T	P	J				
TP141106 A	TP231401	Food Biochemistry	3	1	4	W	MK-PS	BGP	TP141101, FT141104
TP141107	TP231104	Chemical Analysis	2	0	2	W	MK-PS	KAP	-
TP141108 A	TP231303	Food Microbiology & Processing	3	1	4	W	MK-PS	MKP	TP141102

TP141110	TP231201	Industrial Management Food	3	0	3	W	MK-PS	RPP	-
TP141123	TP231502	Statistics	3	0	3	W	MK-PS	IPT	-
UV141110	-	State Defense	3	0	3	W	MKU	-	-
TP141118	TP231202	Principles of Food Engineering	2	0	2	W	MK-PS	RPP	-
TP141115	TP231203	Industrial Operations Unit Food I	3	0	3	W	MK-PS	RPP	-
		TOTAL	18	2	24				

SEMESTER 4

Code Lama	Code New	Course Content	SKS			W/P	Type MK	Realm Science	Prerequisites
			T	P	J				
TP141114	TP231402	Nutrition Science	3	0	3	W	MK-PS	BGP	TP141106
TP141126	TP231204	Industrial Operations Unit Food II	3	1	4	W	MK-PS	RPP	TP141115
TP141116	TP231105	Food Chemistry	3	0	3	W	MK-PS	KAP	TP141104
TP141117	TP231106	Food Analysis	3	1	4	W	MK-PS	KAP	-
TP191137	TP231503	Trial Design	3	0	3	W	MK-PS	IPT	TP141123
TP141127	TP231205	Processing Technology Food	3	1	4	W	MK-PS	RPP	-
TP141240	TP231403	Functional Food	2	0	2	W	MK-PS	BGP	-
		TOTAL	20	3	23				

SEMESTER 5

Code Lama	Code New	Course Content	SKS			W/P	Type MK	Realm Science	Prerequisites
			T	P	J				
TP141137	TP231304	Fermentation Technology Food	2	0	2	W	MK-PS	MKP	TP231303
TP141124	TP231305	Thermal Process of Food	3	0	3	W	MK-PS	RPP	-
TP141149	TP231206	Industrial Design Processing	2	0	2	W	MK-PS	RPP	-
TP141135	TP231306	Management and Food Quality Control	3	0	3	W	MK-PS	MKP	-
FTI3102	TP231504	Research Methodology	3	0	3	W	MK-PS	IPT	-
TP141156	TP231505	Sensory Evaluation	2	1	3	W	MK-PS	RPP	TP141103
TP141119	TP231506	Food Legislation	2	0	2	W	MK-PS	IPT	-
TP141147	TP231307	Sanitation & Safety Food	2	0	2	W	MK-PS	MKP	TP231303
TP141145	TP231507	Product Development Food	2	0	2	W	MK-PS	IPT	-
		TOTAL	21	3	22				

SEMESTER 6

Code Lama	Code New	Course Content	SKS			W/P	Type MK	Realm Science	Prerequisites
			T	P	J				
FT141107	-	Engineering Economics	2	0	2	W	MKF	-	-
UV141114	-	Entrepreneurship	3	0	3	W	MKU	-	-

UV21013		Leadership	2	0	2	W	MKU	-	
TP141148	TP231207	Packaging and Storage	3	0	3	W	MK-PS	RPP	-
UV141115	-	Real Work Lecture	0	2	2	W	MKU	-	-
FT141108	-	Fieldwork Practice	0	2	2	W	MKF	-	-
		Elective Course 1	2	0	2	P	MK-PS	-	-
		Elective Course 2	2	0	2	P	MK-PS	-	-
		Elective Course 3	2	0	2	P	MK-PS	-	-
		Elective Course 4	2	0	2	P	MK-PS	-	-
		TOTAL	18	4	22				

SEMESTER 7

Code Lama	Code New	Course Content	SKS			W/P	Type MK	Realm Science	Prerequisites
			T	P	J				
		Elective Course 1	2	0	2	P	MK-PS	-	-
		Elective Course 2	2	0	2	P	MK-PS	-	-
		Elective Course 3	2	0	2	P	MK-PS	-	-
		Elective Course 4	2	0	2	P	MK-PS	-	-
		TOTAL	8	0	8				

SEMESTER 8

Code Lama	Code New	Course Content	SKS			W/P	Type MK	Realm Science	Prerequisites
			T	P	J				
TP141150	TP234001	Thesis	6	0	6	W	MK-PS	-	-
		TOTAL	6	0	6				

ELECTIVE COURSES

Code Lama	Code New	Course Content	SKS			W/P	Type MK	Realm Science	Prerequisites
			T	P	J				
TP141254	TP232508	Processing Technology Coffee, Tea & Cocoa	2	0	2	P	MK-PS	IPT	TP141105
TP141244	TP232509	Flavor Technology	2	0	2	P	MK-PS	IPT	TP141105
TP190321	TP232510	Spice Technology and Bumbu	2	0	2	P	MK-PS	IPT	TP141105
TP190421	TP232511	*Bakery* Technology	2	0	2	P	MK-PS	IPT	-
TP190521	TP232512	Sugarcane Processing Technology	2	0	2	P	MK-PS	IPT	TP141106 and TP141101
TP190621	TP232513	Tech. Legumes, Cereals, and Tubers	2	0	2	P	MK-PS	IPT	TP141105
TP170821	TP232514	Food of the Archipelago	2	0	2	P	MK-PS	IPT	-
TP141232	TP232515	Dairy Technology	2	0	2	P	MK-PS	IPT	TP141105
TP141233	TP232516	Meat Technology and Fish	2	0	2	P	MK-PS	IPT	TP141105
TP141234	TP232517	Fruit Technology and Vegetable	2	0	2	P	MK-PS	IPT	TP141105
TP141243	TP232308	Food Biotechnology	2	0	2	P	MK-PS	MKP	-

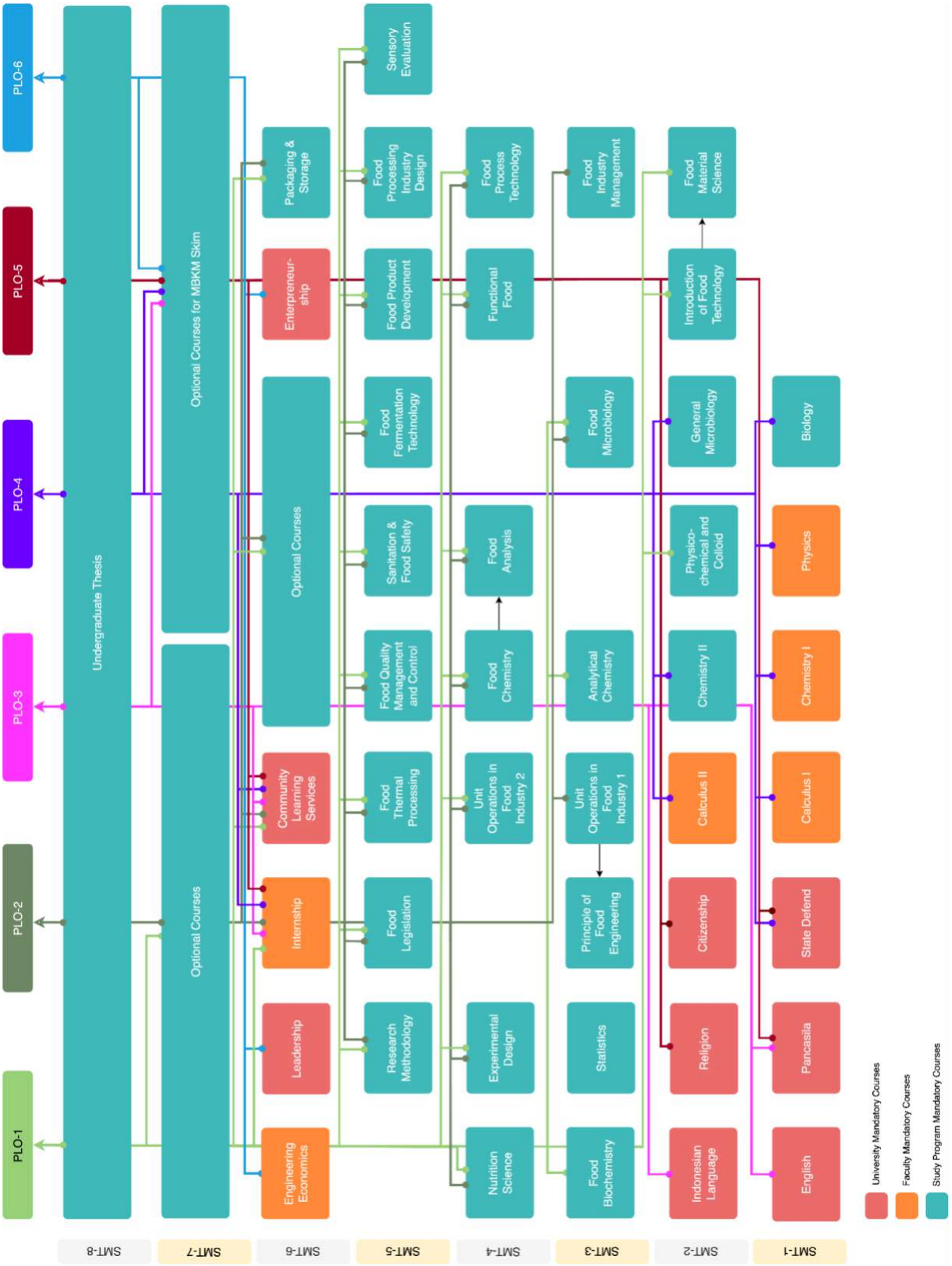
TP141212	TP232518	Food Service Industry	2	0	2	P	MK-PS	IPT	-
TP141213	TP232519	Marketing Management	2	0	2	P	MK-PS		-
TP191245	TP232309	Utilization Technology	2	0	2	P	MK-PS	MKP	-
		and Waste Handling							
TP141221	TP232107	Additional Ingredients Food and Toxicology	2	0	2	P	MK-PS	KAP	-
TP191247	TP232208	Machine and Design Build Tools	2	0	2	P	MK-PS	RPP	-
TP141238	TP232404	Food Nutrition Evaluation and Processing	2	0	2	P	MK-PS	BGP	-
TP141239	TP232520	Operational Research	2	0	2	P	MK-PS	RPP	-
TP141228	TP232108	Carbohydrate Technology	2	0	2	P	MK-PS	KAP	-
TP141230	TP232109	Fats/Oil Technology	2	0	2	P	MK-PS	KAP	-
-	TP232521	Product Assurance System Halal	2	0	2	P	MK-PS	IPT	-

ENRICHMENT COURSES

Code Lama	Code New	Course Content	SKS			W/P	Type MK	Realm Science	Prerequisites
			T	P	J				
TP220457		Public Relations	2	0	2	P	MKP-PS	KIP	-
TP220458		Development society	2	0	2	P	MKP-PS	KIP	-
TP220459		Communication Interpersonal	2	0	2	P	MKP-PS	KIP	-
TP220460		Community Outreach	2	0	2	P	MKP-PS	KIP	-
TP220461		Planning and participatory evaluation	2	0	2	P	MKP-PS	KIP	-
TP220462		Ability Organize	2	0	2	P	MKP-PS	KIP	-
TP220463		Innovation and Creativity	2	0	2	P	MKP-PS	KIP	-
TP220464		Geopolitics and sources natural resources	2	0	2	P	MKP-PS	KIP	-
TP220465		T. Management Public Health	2	0	6	P	MKP-PS	KIP	-
TP220466		Creative Economy	2	0	2	P	MKP-PS	KIP	-
TP220467		Telenta Development and Profession	2	0	2	P	MKP-PS	KIP	-
TP220468		Critical Thinking	2	0	2	P	MKP-PS	KIP	-
TP220469		Scientific Communication	2	0	2	P	MKP-PS	KIP	-
TP220470		Food Entrepreneurship	2	0	2	P	MKP-PS	KIP	-

TP220471		Business Strategy	2	0	2	P	MKP-PS	KIP	-
TP220472		Digital Marketing	2	0	2	P	MKP-PS	KIP	-
TP220473		Event Management	2	0	2	P	MKP-PS	KIP	-
TP220474		Consumer Behavior	2	0	2	P	MKP-PS	KIP	-
TP220475		Teamwork	2	0	2	P	MKP-PS	KIP	-
TP220476		Diversity and Multicultural	2	0	2	P	MKP-PS	KIP	-

Description:
W : Required Courses
P : Elective Course MKU
: University Course MKF
: Faculty Course
MK-PS : Study Program Course
MKP-PS : Enrichment Course for KAP Study
Program : Food Chemistry and Analysis
BGP : Biochemistry and Food Nutrition
MKP : Microbiology and Food Safety RPP
: Food Process Engineering
IPT : Applied Food Science
KIP : Enrichment Science Group



Flowchart of Course Flow and Relationship to SLOs based on the ongoing semester

3.3 MATRIX OF COURSES AND LEARNING OUTCOMES

Table 11 Matrix of Courses associated with Learning Outcomes

No.	Code	Course Content	CPL-1	CPL-2	CPL-3	CPL-4	CPL-5	CPL-6
1st semester								
1	UV141111	English			✓			
2	UV141107	Pancasila Education			✓		✓	
3	UV141110	State Defense				✓	✓	
4	FT141101	Calculus I				✓		
5	FT141103	Physics				✓		
6	FT141104	Basic Chemistry				✓		
7	TP2313101	Biology				✓		
2nd semester								
8	UV141109	Bahasa Indonesia			✓			
9	UV141108	Citizenship					✓	
10	FT141102	Calculus II				✓		
11	UV141101 UV141102 UV141103 UV141104 UV141105 UV141106	Islam Religion Christianity Religion Catholicism Religion Hinduism Religion Buddhism Khong Hu Cu religion					✓	
12	TP231302	General Microbiology				✓		
13	TP231501	Introduction to Food Technology	✓					
14	TP231101	Advanced Chemistry				✓		
15	TP231102	Food Ingredient Knowledge	✓					
16	TP231103	Physical Chemistry and Colloids	✓					
3rd semester								
17	TP231401	Food Biochemistry	✓					
18	TP231104	Chemical Analysis	✓					
19	TP231303	Food & Processing Microbiology	✓	✓				
20	TP231201	Food Industry Management		✓				
21	TP231502	Statistics	✓					
22	TP231202	Principles of Food Engineering	✓					

23	TP231203	Food Industry Operations Unit I	✓	✓				

4th semester								
24	TP231402	Nutrition Science	✓	✓				
25	TP231204	Food Industry Operations Unit II	✓	✓				
26	TP231105	Food Chemistry	✓	✓				
27	TP231106	Food Analysis	✓	✓				
28	TP231503	Trial Design	✓	✓				
29	TP231205	Food Processing Technology	✓	✓				
30	TP231403	Functional Food	✓	✓				
5th semester								
31	TP231304	Food Fermentation Technology	✓	✓				
32	TP231305	Thermal Process of Food	✓	✓				
33	TP231206	Processing Industry Design	✓	✓				
34	TP231306	Management and Food Quality Control	✓	✓				
35	TP231504	Research Methodology	✓	✓				
36	TP231505	Sensory Evaluation	✓	✓				
37	TP231506	Food Legislation	✓	✓				
38	TP231307	Sanitation & Food Safety	✓	✓				
39	TP231507	Food Product Development	✓	✓				
6th semester								
40	FT141107	Engineering Economics						✓
41	UV141114	Entrepreneurship						✓
42	UV21013	Leadership			✓	✓	✓	
43	TP231207	Packaging and Storage	✓	✓				
44	UV141115	Community Service	✓	✓	✓	✓	✓	
45	FT141108	Fieldwork Practice	✓	✓	✓	✓	✓	
46		Elective Course 1	✓	✓				
47		Elective Course 2	✓	✓				
48		Elective Course 3	✓	✓				
49		Elective Course 4	✓	✓				
50		Elective Course 5	✓	✓				

7th semester								
51		Elective Course 1	✓	✓				
52		Elective Course 2	✓	✓				
53		Elective Course 3	✓	✓				
54		Elective Course 4	✓	✓				
8th semester								
55	TP234001	Thesis	✓	✓	✓	✓	✓	
Elective Courses								
CT	TP232508	Coffee, Tea & Cocoa Processing Technology	✓	✓				
CT	TP232509	Flavor Technology	✓	✓				
CT	TP232510	Spice and Seasoning Technology	✓	✓				
CT	TP232511	*Bakery* Technology	✓	✓				
CT	TP232512	Sugarcane Processing Technology	✓	✓				
CT	TP232513	Tech. Legumes, Cereals and Tubers	✓	✓				
S	TP232514	Food of the Archipelago	✓	✓				
CT	TP232515	Dairy Technology	✓	✓				
CT	TP232516	Meat and Fish Technology	✓	✓				
CT	TP232517	Fruit and Vegetable Technology	✓	✓				
CT	TP232308	Food Biotechnology	✓	✓				
ST	TP232518	Food Service Industry	✓	✓				
S	TP232519	Marketing Management	✓	✓				
ST	TP232309	Utilization Technology and Waste Handling	✓	✓				
CA	TP232107	Food Additives and Toxicology	✓	✓				
T	TP232208	Machine and Tool Design	✓	✓				
TA	TP232404	Food Nutrition Evaluation and Processing	✓	✓				
S	TP232520	Operational Research	✓	✓				
T	TP232108	Carbohydrate Technology	✓	✓				
T	TP232109	Fats/Oil Technology	✓	✓				

S	TP232521	Halal Product Assurance System	✓	✓				

Enrichment Courses								
	TP220457	Public Relations			✓			
	TP220458	Community development			✓			
	TP220459	Interpersonal Communication			✓			
	TP220460	Community Outreach			✓			
	TP220461	Participatory planning and evaluation				✓		
	TP220462	Organizational Skills			✓			
	TP220463	Innovation and Creativity				✓		
	TP220464	Geopolitics and natural resources				✓		
	TP220465	T. Public Health Management			✓			
	TP220466	Creative Economy						✓
	TP220467	Talent and Professional Development				✓		
	TP220468	Critical Thinking				✓		
	TP220469	Scientific Communication			✓			
	TP220470	Food Entrepreneurship						✓
	TP220471	Business Strategy						✓
	TP220472	Digital Marketing						✓
	TP220473	Event Management				✓		
	TP220474	Consumer Behavior						✓
	TP220475	Teamwork			✓			
	TP220476	Diversity and Multiculturalism					✓	

3.3 COURSE DESCRIPTION AND STUDY MATERIALS

UV141111 ENGLISH

Description: English for students is directed at the ability to read quickly and understand reading, the ability to listen and understand, the ability to write concisely, and the ability to speak clearly. Introduction to vocabulary or terms commonly encountered in the field of food science and technology.

Study Material: Self Introduction and Introduction to General English; Noun, Verb and Adjective; Pronouns; Modal Verbs; Present and Past Tenses; Future and Progressive Tenses; Perfect and Perfect Continuous Tenses; If Clause; Noun Clause; Relative Clause; Conjunction; Phrasal Verb; Comparison and Passive Voice; Reported Speech.

UV141107 PANCASILA EDUCATION

Description: Understanding Pancasila as the Basic Value of the State, the constitutional system of the Republic of Indonesia with Historical, Juridical, Philosophical, Ideological Studies and Understanding Pancasila as an Actualization Paradigm in the Life of Society, Nation, State. Understanding of the nation, State, Rights and Obligations of Citizens, State Defense, Democratization, Archipelago Concept, Human Rights, Regional Autonomy, Environment, National Resilience and National Strategy Politics.

UV141101 ISLAMIC RELIGION

Description: Examines and provides an understanding of the nature of man who needs life guidance, both individually and socially in order to achieve happiness in the world and the hereafter. By understanding himself and the universe that has been given rules by its creator, the rules are called kauniyah and tanziliyah verses. These verses are detailed in the discussion of aqidah, shari'ah, akhlaq and Islamic history. The main emphasis is on the application of these teachings to everyday behavior, both

which comes from the Qur'an and the sunnah of the Prophet Muhammad SAW.

Study Material: The concept of religion, the history of human understanding of God, the ability to prove the existence of God, the formation and correlation between the concepts of faith and piety, signs of faith and piety, piety in individual and community life, the concept of man as a servant and khilafah on earth, the concept of khilafah in social life, Islam and law, human rights, and democracy, Islamic culture and civilization, akhlaq in Islam, worship in Islam, the concept of rahmatan lil alamin, ukhuwah Islamiyah, ukhuwah insyaniyah and ukhuwah wathoniy.

FT141101 CALCULUS I

Description: Functions, limit values, derivatives of functions, continuity, differential calculations, applications of differential calculations, extreme values of functions, infinite series, limits of certain forms, indefinite integrals, rational/irrational quadratic integrals, partial integrals, integral reduction formulas for rational functions, integrals and substitution methods, integral product of two trigonometric functions.

Study Material: Real Number System, Equations and Inequalities, Functions and Limits, Derivatives, Use of Derivatives, Indefinite Integrals

FT141103 BASIC PHYSICS

Description: This course is a compulsory course that discusses physical phenomena and their application specifically in food technology.

Study Materials: Magnitude, Units and Dimensions, Energy and the Law of Conservation of Energy, Elasticity, Static and Dynamic Fluids, Vibrations and Waves, Kinetic Theory of Gases, Temperature, Heat (Caloric), Law of Thermodynamics I and Heat Transfer, Electric Fields and Potentials, Electric Currents and Barriers, Electrical Arrays, Electromagnetic Waves, Atomic and Nuclear Physics.

FT141104 BASIC CHEMISTRY

Description: +Discusses stoichiometry, atomic structure, periodic system, chemical bonding and molecular structure, acid and base theory, H ion concentration and pH, hydrolysis and anchoring mixtures, redox reactions, colligative properties of a solution, reaction speed.

Study Material: Knowledge of basic particles and the development of atomic theory, Knowledge of chemical formulas, reaction equations and chemical calculations, Knowledge of the development of the periodic system of elements, Knowledge of solutions, enthalpy changes, and the laws of thermodynamics, Knowledge of pH, acid-base theory and its laws, Knowledge of hydrolysis events, anchoring solutions, and polyvalent acids and bases, Knowledge of redox reactions and chemical reaction equilibrium, Knowledge of reaction speed and colligative properties of solutions.

Practicum: Preparation of concentration, dilution, standard solution, titration, standardization, acid-alkalimetry.

TP141101 BIOLOGY

Description: Knowledge of the classification of living things, knowledge of cells and organisms, life as a whole and life at the cellular level. Function of cell organelles. Cell growth and proliferation: population growth cycle, individual (cell) growth cycle.

Study Material: Understanding various things related to the classification of living things, cells, organisms, cell organelle functions, cell reproduction, and population and individual growth.

Practicum: Introducing the parts of the microscope and their functions and how to use them. Studying plant cell tissues, animal cells, and microorganisms with preparations.

UV141109 INDONESIAN LANGUAGE

Description : This course is a compulsory course that discusses the development of Indonesian language personality.

Study Material: Use Indonesian to enrich scientific thoughts, ideas, and attitudes into various forms of quality scientific work (meeting the requirements of objectivity, coherence, cohesion, effectiveness, efficiency, and communicativeness); critically edit various scientific works and improve them based on the results of editing; utilize skills in Indonesian to develop themselves throughout life both orally and in writing.

UV141108 CITIZENSHIP

Description: This course is a general course in personality development in understanding about Indonesia, having an Indonesian personality, having a sense of Indonesian nationality, and loving the Indonesian homeland. Thus, it is expected to become a good and educated citizen (smart and good citizen) in the life of the community, nation, state and obey the law.

Study Material: Civic Education in developing the full capabilities of undergraduate or professional; National identity as one of the determinants of nation and character building; National integration as one of the parameters of national unity and integrity; 1945 Constitution and statutory provisions under the Constitution; Obligations and rights of the State and citizens in a democracy based on popular sovereignty and deliberation for consensus; Indonesian democracy based on Pancasila and the 1945 Constitution; Equitable law enforcement; Archipelago as a conception and collective view of Indonesian nationality in the context of world relations; Description of national resilience and defense; State for Indonesia in building collective national commitment**.**

FT141102 CALCULUS II

Description: This course is a compulsory course that discusses the basics of calculus regarding certain integrals, the use of certain integrals, and various forms of integrals.

differential equations, applications of calculus to aspects of food technology (including identification of graphing components).

Study Material: Concept of Certain Integrals Certain integrals to calculate the volume of a rotating object, the area of the skin of a rotating object and the length of the arc Concept of Differential Equations Various forms of differential equations: separate variables, homogeneous, exact and non-exact, linear, and Bernoulli.

TP141102 GENERAL MICROBIOLOGY

Description: This course is a compulsory course that discusses the history and scope of microbiology, prokaryotic and eukaryotic cells, growth curves and factors affecting microbial growth, microbial metabolic processes (anabolism, catabolism, and energy production by microbes), properties and characteristics of bacteria, molds, yeasts, and viruses, sterilization and disinfection methods, methods of observation and identification of microorganisms, conventional and *rapid* analysis methods of microorganisms in foodstuffs, and introduction to microbial genetics.

Study Material: The development of microbiology, branches of microbiology, and the urgency of microbiology in the food sector, Cells (cell morphology, cell structure and components and their functions) and microbial movement mechanisms, Bacteria (classification, morphology, structure, colony morphology, and important bacteria in daily life related to food), Molds (classification, morphology, physiological properties, reproductive systems and important molds in daily life related to food) and mycotoxins, Yeast (classification, morphology, reproductive system and physiological properties) and viruses (characteristics, shape and size, body structure, replication mechanism and viruses in food), Microbial growth and factors affecting its growth, Microbial metabolism (anabolism and catabolism), Principles of sterilization and disinfection, Methods of observation, isolation and identification of microbes,

Conventional and rapid microbial analysis principles, microbial genetics, and identification principles using PCR.

TP141103 INTRODUCTION TO FOOD TECHNOLOGY

Description: This course is a compulsory course that discusses the constituent properties of food ingredients, factors and causes of food damage, ways of preserving food ingredients, factors and methods of processing food ingredients and their applications in the food field.

Study Material: Introduction; food constituent compounds; factors causing food deterioration; microbial resistance in food; factors affecting high temperature and low temperature processing; factors affecting drying; preservation methods using irradiation; fermentation; food additives; traditional food processing; packaging and controlled atmosphere storage.

TP141104 ADVANCED CHEMISTRY

Description: This course is a compulsory course that discusses the basics of chemical physical properties of solid, liquid and gas compounds, the relationship of spectra with atomic and molecular structures, chemical thermodynamics Reaction and reactivity of organic compounds, discussing alkanes, alkenes, alkynes, alcohols, ethers, aldehydes, ketones, carboxylic acids, esters, aromatic compounds, organic halogen compounds, stereochemistry, polymers. Reactions in organic molecules (substitution, elimination, esterification, etherification, hydrolysis, amidation, etc.), isometry and stereoisometry, classes of compounds based on functional groups, biomolecular compounds of carbohydrates, proteins, fats.

Study Material: Knowledge of solid, gas and liquid compounds; Knowledge of spectral relationships and atomic and molecular structures; Understanding of hydrocarbons; Types and properties of functional groups; Reactions in organic molecules; Properties of biomolecular compounds.

carbohydrates; Properties of protein biomolecular compounds; Properties of fat biomolecular compounds

TP141105 FOOD INGREDIENT KNOWLEDGE

Description: This course explains the characteristics of food commodities including vegetable and animal food. The discussion includes physical and chemical characteristics of food ingredients, quality of ingredients, handling methods, as well as the suitability of their application in food processing based on their characteristics.

Study Material: The scope of knowledge of food ingredients, cereals, legumes, fruits and vegetables, tubers, vegetable fruits, meat, milk, fishery products. Plant-based food commodities include cereals, beans, tubers, fruits, vegetables, spices, herbs, and plantation commodities. Animal food commodities include red meat, poultry meat, milk, eggs, and fishery commodities.

Practicum: Knowledge of fruit and vegetable foods, cereals, beans and tubers, peeling methods, the effect of ethylene on fruit ripening, knowledge of animal foods (milk, eggs, meat and fish), testing the physical properties of food materials and products.

TP141109 PHYSICAL CHEMISTRY AND COLLOIDS

Description : Understanding the form of an object, the laws of thermodynamics, solutions and colligative properties of solutions, colloidal systems, emulsions, froth, interfacial tension, diffusion phenomena, osmosis, aggregate formation, nucleation, crystallization and rheological properties, especially food ingredients.

Study Material: Gas properties, liquid properties, colloidal systems, interfacial phenomena, colligative properties of solutions, rheological properties, thermal properties of materials, optical properties, micro and macro structures in food materials, physical properties of food additives.

TP141106 FOOD BIOCHEMISTRY

Description: In this course, students learn about the principles of biochemical aspects that discuss the cycle of processes experienced by living bodies, various structures and biomolecules (proteins, carbohydrates, and lipids); and their interactions in water, acids and bases. Concepts about metabolism and bioenergetics that explain how organisms get energy through glycolysis, Kreb's cycle, electron transfer, photosynthesis, pentose phosphate pathway, urea cycle, biological oxidation of fatty acids and macromolecular synthesis (carbohydrates and lipids).

Study Material: Logic of living cells and their organization, water in living cells, carbohydrates, proteins, protein metabolism, enzymes, biochemical genetics, hormones and their functions, lipid metabolism, lipids, respiration and transpiration processes, vitamin and mineral metabolic processes.

Practicum: Qualitative tests and properties of food ingredients (carbohydrates, oils and fats, proteins, enzymes and starch digestion), as well as respiration and fermentation; identification of functional properties of food components (carbohydrates, proteins, fats, and micro components);

TP141107 ANALYTICAL CHEMISTRY

Description: Able to explain the general description of analytical chemistry, the basic needs of analytical equipment and its use techniques (both qualitative and quantitative), how to analyze gravimetry, volumetry, acidimetry, alkalimetry, Argentometry, permanganometry, yodometry, yodimetry. Theory of Error and Accuracy in Chemical Analysis.

Study Material: Scope of chemical analysis, solvent extraction, liquid test, theory of accuracy of chemical analysis, use of analytical techniques, techniques for using and selecting tools for qualitative and quantitative analysis, Permanganometry, Argentometry, Yodometry, Oxidation-reduction, Complexometry, and Volumetry.

TP141108 FOOD MICROBIOLOGY AND PROCESSING

Description: Microbial growth, intrinsic and extrinsic factors affecting microbial growth in food, principles of microbial counting in food; principles of fermentation processes and the role of beneficial microbes for food; the role of microbes in microbiological damage to various types of food and processed products, as well as pathogenic microbes in food and diseases caused by pathogens and principles for controlling these microbes.

Study Material: Knowledge, science and philosophy; definition of knowledge, science and philosophy, scientific and non-scientific approaches, tasks of science and research; Problem formulation and literature review; problem identification, literature review, problem formulation; Research Methods; historical research, descriptive research, developmental research, case and field research, correlational research, comparative causal research, real experimental research, quasi-experimental research, action research; Theoretical Framework and Hypothesis Formulation; theoretical basis, variables, hypotheses; Sample Selection; frequently used terminology, reasons for sample selection, sample characteristics, methods of determining samples, sample design; Development of data collection instruments; instrument specifications, instrument testing, analysis of test results, validity and reliability of instruments, determination of the final set of instruments; Data collection and data processing; types of data (quantitative, qualitative), secondary data, primary data, and statistical data processing; Simple experimental design; anatomy of a research proposal and its preparation format

Practicum: Media sterilization and aseptic technique, microbial growth medium, culture isolation and transfer technique, microbial identification and characterization, microscopic observation (cell morphology of yeast, bacteria, fungi), microbial counting (plate count, MPN, haemacytometer, spectroscopy), microbial growth factors,

Growth curves, sanitation and personal hygiene tests. environmental influences on microbes, nata de coco, tempeh and tape fermentation.

TP141110 FOOD INDUSTRY MANAGEMENT

Description: Understand the concept and application of MIP, SOP, food industry management approach, quality control management, application of HACCP, CPM and PERT, food product quality, strategic planning, marketing and marketing mix.

Study Material: Knowledge of the basic principles of management; Knowledge of the character of the food industry; Knowledge of the application of planning, organizing, actuating and controlling; Knowledge of the application of management planning, production, human resources, quality control, warehousing and marketing in the food industry; Knowledge of the steps for preparing SOPs; Knowledge of how to schedule projects; Knowledge of CPM and PERT; Knowledge of management certification in the food industry.

UV141108 STATE DEFENSE

Description: Understanding of the values, norms, ethics, moral character and national identity, and having the character of defending the State, among others: belief in the supremacy of Pancasila, love for the country, aware of rights and obligations, willing to sacrifice and have the initial ability to defend the State. Know and understand the factors that affect the awareness of State defense, national vigilance originating from within and outside the country, policies for fostering awareness of State defense, national vigilance originating from within and outside the country, policies for fostering awareness of State defense, understanding good, clean and authoritative government and governance.

Study Materials: The mindset of State Defense education; Conception of State Defense Education; Character and National Self; Widya Mwat Yasa and Jati

UPN "Veteran" Self; State Defense Subtance Elements; State Defense in National Development; Influencing State Defense awareness; Leadership and Entrepreneurship; Military and Non-Military Threats and National Vigilance; State Defense Awareness fostering policies; Clean and authoritative good governance; Anti-corruption; State Defense Acculturation.

TP141213 MARKETING MANAGEMENT

Description: This course is an elective course that discusses the basic concepts in marketing management. The subjects presented in this course include basic marketing concepts, environmental analysis, competitors and customers, segmentation - target market determination and positioning, marketing mix and integrated marketing tools in order to create, communicate and present something of value to customers.

Study Material: Knowledge of the role of marketing in organizations and society; Knowledge of marketing analysis and influential factors in marketing; Knowledge of marketing segmentation, target market determination and product placement (posisioning); Various marketing strategies and marketing strategies in the product life cycle; Steps in new product development, idea generation and product testing; Principles of marketing mix; Planning effective advertising programs; Knowledge of organizing companies and implementing marketing programs.

TP141114 NUTRITION SCIENCE

Description: This course is a compulsory course that discusses the relationship between nutrients and health, in meeting energy needs, growth, maintenance and maintaining a healthy body. The material studied includes the digestive system and absorption of nutrients (carbohydrates, proteins, fats,

vitamins, minerals), dietary fiber and resistant starch, energy requirements, interrelationships of nutrient metabolism, and diseases caused by nutrient deficiencies.

Study Material: Knowledge of the digestive system, physiology of nutrients (carbohydrates, proteins, fats, vitamins, minerals, water and dietary fiber), energy requirements, nutritional adequacy, and malnutrition.

TP141115 FOOD INDUSTRY OPERATIONS UNIT I

Description: Discusses fluid flow systems (both compressible and non-compressible), fluid flow measurement (various measuring instruments, applications and calculations), mixing and emulsification, material size reduction and mechanical separation (sedimentation, centrifugation and filtration).

Study Material: System of units and dimensions, mass balance, thermodynamic principles, mass balance, energy balance, fluid flow, evaporation, distillation and condensation.

TP141116 FOOD CHEMISTRY

Description: This course is a compulsory course that discusses the definition including chemical structure, physico-chemical properties, chemical reactions, the role / function of chemical components in food ingredients and products including water, carbohydrates, lipids, proteins, pigments, vitamins, minerals, flavors, food additives, and minor components (phenolic compounds, saponins, toxicants, antinutrients, and others). Changes in the physico-chemical characteristics of food due to processing in relation to chemical changes in these food components. Interactions between components in food products in general.

Study Material: Water chemistry, chemistry of complex carbohydrates and polysaccharides, protein chemistry, fat chemistry, rancidity, color in foodstuffs, vitmin, minerals

TP141117 FOOD ANALYSIS

Description: This course is a compulsory course that discusses the preliminary treatment of samples and sampling techniques. Chemical analysis includes principles and methods of proximate analysis of protein content, carbohydrate content, fat content, water, vitamins, minerals, pigments, as well as an introduction to antioxidant activity analysis, and food additives. Modern food analysis includes basic principles and an introduction to the application of chromatography, electrophoresis, and ELISA techniques in food analysis.

Study Material: Knowledge of food analysis methods and quality data; Knowledge of sample preparation and preparation; Qualitative and quantitative analysis methods of moisture content and Aw; Understanding of qualitative and quantitative analysis methods of ash content; Knowledge of qualitative and quantitative analysis methods of protein content; Knowledge of quantitative analysis methods of sugar, starch and fiber content; Knowledge of quantitative analysis methods of vitamins and minerals; Knowledge of quantitative analysis methods of bioactive components and antioxidants; Knowledge of how to analyze using modern instrumentation, namely Spectrophotometer, HPLC, GC, AAS, LC-MS, TLC and UPLC.

Practicum: Analysis of proximate and food additives, gravimetric and volumetric methods, use of chromatographic and spectrophotometric methods for qualitative and quantitative determination of food components.

TP141118 FOOD ENGINEERING PRINCIPLES

Description: Application of engineering principles in quantitative analysis of food processing systems that include unit and dimensional systems, mass balance, thermodynamic principles, energy balance, transport phenomena (including rheology and fluid flow, heat transfer, and mass transfer); as well as engineering and physical

principles for food processing and preservation processes which include

principles of dehydration, evaporation, refrigeration, freezing and process heat.

Study Material: Dimensional analysis, mass balance, heat balance, conduction, convection, radiation.

TP141119 FOOD LEGISLATION

Description: Discusses the relationship between food and health, government responsibilities towards businesses and consumers, food law regulations, packaging regulations, food quality standards.

Study Material: Definition of food legislation, rights and obligations of food business actors, food supervision and distribution, labeling, regulation of the use of food additives, food certification, dispute resolution.

TP141220 WASTE HANDLING AND UTILIZATION TECHNOLOGY

Description: This course is an elective course that discusses the understanding, types, principles and technology of handling solid waste and liquid waste physically, chemically and biologically, and the treatment of waste generated by the food industry (fruit, vegetables, cereals, meat, seafood, and milk), as well as the application of ISO 14040.

Study Material: Understanding various matters related to the handling and utilization of waste generated by the food industry, starting from the definition, type, nature, impact and importance of waste handling and utilization; physical, chemical and biological properties of industrial waste and characteristics of food industry waste; principles of physical, chemical and biological waste handling techniques; various waste handling methods (ponds, lagoons, activated sludge, aerobic and anaerobic); various techniques and methods related to the utilization of food industry waste from various commodities; and principles and application of ISO 14040: life cycle assessment (LCA) in the food industry.

TP141221 FOOD ADDITIVES AND TOXICOLOGY

Description: This course is an elective course that discusses the types and functions of food additives, their application and role in food products, standards for the use of food additives, concepts and types of toxicology, toxicological classification of food sources and their effects on health....

Study Material: Types, applications and role of BTP in food products; regulation of the use of BTP; Concept of toxicology, Types of toxicology, Classification of toxic ingredients in food products in various sources and their impact on health, nutrification

TP141222 MACHINE AND TOOL DESIGN

Description: The subject of machinery and equipment discusses understanding the specifications and working principles of processing equipment and machinery for food which includes power generation equipment / machinery, handling / moving materials, including washing, cleaning, size reduction, drying, frying, cooling and freezing equipment, evaporation, crystallization, centrifugation, extrusion, distillation, filtration, and several other food industry equipment.

Study Material: Power generation machines, material handling/moving machines, size reduction machines, drying machines, frying machines, cooling and freezing machines, evaporation machines, crystallization machines, centrifugation machines, extrusion machines, distillation machines, and filtration machines in the food processing industry,

TP141123 STATISTICS

Description: Introduction to basic statistical techniques and their applications for experimental design, data collection, and data analysis as well as communicating them orally.

as well as in writing. Variability modeling and parameter estimation and hypothesis testing. Simple regression and correlation analysis

TP141124 FOOD THERMAL PROCESS

Description: This food thermal process course discusses food preservation, evaporator heat transfer, types of product tests, the effect of heat on food ingredients, types of packaging materials, how retorts work, z value calculations, TDT curves, commercial sterilization.

Study Material: Preservation of foodstuffs, heat load in the evaporation process, analysis of various thermal product tests, heat treatment of canned materials, packaging in canning, heat processes, the effect of heat on microorganisms, enzymes and nutrients, calculating Z, D, and F0 values (minimum process time), TDT curves, commercial and absolute sterilization, the best process temperature in food sterilization, thermal process temperature by graph method, thermal process formula and gileppsi method.

FT141106 RESEARCH METHODOLOGY

Description: This course is a compulsory course that discusses the principles and methods of research that will be used when conducting thesis research or final project.

Study Material: Students learn about the understanding of knowledge and ethics in research, formulating problems, making hypotheses, making research designs in accordance with the methods they choose, collecting, processing data, and discussing research results, systematics of writing proposals and theses, reference management (Zotero, Mendelaey etc.), scientific presentation techniques, and making scientific articles.

TP141125 FOOD QUALITY MANAGEMENT SYSTEM

Description: This course studies the theory and concept of quality to control, ensure and improve quality, quality management system, ISO, Halal, as well as the elements of quality, quality control methods, quality assurance, GMP and HACCP applied to the food industry.

Study Material: The elements of quality, ways of quality control, quality assurance, GMP and HACCP applied to the food industry quality theories and concepts to control, guarantee and improve quality, as well as an introduction to the ISO quality management system and its development and halal management system.

TP141126 FOOD INDUSTRY OPERATIONS UNIT II

Description: This Food Industry Operations Unit II course discusses the basics of processes in the food industry which include crystallization, cooling, freezing, extraction, drying, evaporation and distillation.

Study Material: Crystallization Operation Unit Cooling and Freezing Operation Unit Extraction Operation Unit Drying Operation Unit Evaporation Operation Unit Distillation Operation Unit

Practicum: Train skills in the application of heat and mass transfer theory in processing. Size reduction/grinding, meat emulsion making, microwave popcorn making, mechanical extraction, solvent extraction, sedimentation, centrifugation, filtration, crystallization, cooling and freezing.

TP141127 FOOD PROCESSING TECHNOLOGY

Description: This course is a compulsory course that discusses the principles of processing and preservation of foodstuffs using high temperature, low temperature, drying, extrusion, fermentation, the use of food additives and the use of food additives.

non-thermal preservation, such as pulsed electric fields, magnetic field oscillations, and irradiation.

Study Material: Various food processing, as well as food damage, preservation principles, cooling and the impact on processed food, blanching, and pasteurization, smoking, and extrusion, the role of BTM in processed food, methods of preserving food ingredients.

Practicum: The practicum covers the basics of processing such as drying technology, bakery technology, meat and fish processing technology, dairy and soybean processing technology, egg processing technology, technology with smoking, processing technology with sugar, salt, and acid and other preservatives, and medium water content food technology (IMF: fruit leather, jam, jelly; candy).

TP141228 CARBOHYDRATE TECHNOLOGY

Description: The carbohydrate technology course discusses basic knowledge of physical and chemical properties, natural sources, component structures, handling methods and their applications in the food sector. The materials discussed include pectin, chitosan, food fiber, resistant starch, hydrocolloids and their applications.

Study Materials: carbohydrate chemistry; starch, its properties and applications; rice technology; chitin and chitosan; pectin; non-rice rice technology; resistant starch; food fiber; alginate; carrageenan; agar.

TP141230 FATS AND OILS TECHNOLOGY

Description: The Fats and Oils Technology course equips students with knowledge and skills about vegetable food oil processing technology, oil *refining* (*refining bleaching, deodorizing*), oil characterization and quality standards, oil modification (fractionation, hydrogenation and interesterification), oil damage (oxidation, hydrolysis) and antioxidants.

Study Material: Introduction to fats and oils technology, coconut oil and VCO processing technology, palm oil processing technology, oil refining (degumming, refining, bleaching, deodorizing), modification of fats and oils including hydrogenation, fractionation and ineresterification, damage to fats and oils including hydrolytic and oxidative damage, and antioxidants in preventing damage to food fats and oils.

TP141232 DAIRY PROCESSING TECHNOLOGY

Description: Understanding the concept of applying technology to milk processing. Chemical composition and properties of each component. Processing of milk into several products such as condensed milk, milk powder, butter, cheese, fermented milk-yogurt and kefir and others.

Study Material: Introduction (milk characteristics); milk composition; basic principles of milk processing; milk processing using high and low temperatures; milk drying; protein preparation; butter; fermented milk; cream; cheese,

TP141233 MEAT AND FISH PROCESSING TECHNOLOGY

Description: In this course students learn about the principles of biochemical changes of carcasses and skeletal muscles after post-mortem. Control of spoilage and pathogenic microbial contamination in the production chain of fresh and processed meat and fish. Application of preservation principles and value-added processing technologies. Current topics relevant to the industry and trade of meat and fish products.

Study Material: Nutrition in meat, types of meat preservation and processing, curing process and methods, emulsified sausage products, smoking preservation process, fish drying and canning products, fish processing (surimi, otak-otak, kamaboko, fermented products).

TP141234 FRUIT AND VEGETABLE PROCESSING TECHNOLOGY

Description: The Fruit and Vegetable Technology course discusses the principles and methods of processing fruits and vegetables into dried fruits, fruit candy, fruit/vegetable chips, jam-jelly, pickles, juice, wet and dry sweets, and canned fruits/vegetables.

Study Material: Principles and concepts of fruit and vegetable handling and processing technology, damage that occurs in fruits and vegetables, storage of fruits and vegetables, various processing techniques and preservation of fruits and vegetables.

TP141136 EXPERIMENTAL DESIGN

Description: In this course, we learn how to conduct scientific research including problem determination, identification of experimental research variables and being able to design experiments with various types of experimental designs such as RAL, RAK, Factorial, Randomized Nested and being able to conduct experimental tests with non-parametric (Friedman Test, Wilson, and different tests: t test, BNT and DMRT) and non-experimental design, observation and data collection, interpretation of experimental analysis results.

Study Material: Introduction and basic understanding and terminology in experimental design; Important elements of experimental design; t test; Design theory without grouping: Completely Randomized Design (RAL); Multiple Comparison Test and Orthogonal Comparison (BNT, BNJ and DMRT tests); Randomized Group Design (RAK); Latin Square Design; Factorial Experiment; Data Normality and Data Homogeneity Test; Kruskal Wallis Test; Freadman Test.

FT141107 ENGINEERING ECONOMICS

Description: This course is a compulsory course that discusses the interest formula, the concept of cost, annual and present value equivalence, *rate of return* (RoR), depreciation, taxes, inflation, *benefits*, etc.

cost ratio (BCR), *break even point* (BEP), sensitivity analysis, and other technical analysis.

Study Material: Knowledge of equivalence calculation, Knowledge of depreciation, interest and tax, Knowledge of alternative selection, Knowledge of rate of return analysis, Knowledge of replacement analysis, Knowledge of cost and benefit analysis, Knowledge of *break even point* (BEP), Knowledge of investment appraisal.

UV141114 ENTREPRENEURSHIP

Description: This course is a compulsory course that discusses the basic concepts of entrepreneurship, processes, functions, and entrepreneurship models, ideas, opportunities, risks, and business pioneering and development models, business management and entrepreneurial strategies, core competencies including character, creativity, innovation, and competitive strategies in entrepreneurship, business analysis, and business feasibility studies, business ethics, and business plans.

Practicum: Practice of new product development by considering and involving socio-cultural aspects in society, consumer behavior, new product development management, new product design, technology selection and engineering in new product development, quality testing, sensory, economic feasibility analysis, and marketing trials.

TP141137 FOOD FERMENTATION TECHNOLOGY

Description: This course discusses the scope of the basic concepts of fermentation technology, preparation and sterilization of fermentation media, isolation and selection of microbes, preparation, maintenance and storage of microbial cultures for fermentation, development of microbial strains, operation of bioreactors, factors that influence the fermentation process, microbial kinetics and fermentation technology.

fermentation, harvesting of fermentation products, calculation of fermentation process efficiency and application of fermentation technology.

Study Material: Knowledge of the principles and basic concepts of fermentation technology; Knowledge of the preparation and sterilization of fermentation media; Methods of isolation and selection of microbes; Understanding of the preparation, maintenance and storage of microbial cultures for fermentation; Knowledge of the development of microbial strains and the operation of bioreactors; Knowledge of influential factors in the fermentation process, microbial kinetics and fermentation; Procedures / methods of harvesting fermentation products, calculation of fermentation process efficiency and application of fermentation technology.

TP141138 FOOD NUTRITION EVALUATION AND PROCESSING

Description: This course is an elective course that discusses factors affecting the nutritional value of food and changes in nutrients (carbohydrates, fats, proteins, vitamins, and minerals) during post-harvest handling, processing and storage with chemical, *in vitro and in vivo* evaluation *(bio-assay)* as well as an introduction to animal testing.

Study Material: Scope of nutrition; effects of processing on vitamin and mineral stability; effects of GAP and GHP on nutrition; anti-nutrients; food preparation procedures; chemical and biological evaluation of carbohydrates, fats and proteins; handling of experimental animals.

TP141139 OPERATIONAL RESEARCH

Description: This course is an elective course that discusses optimization techniques that help in making decisions systematically and gradually. The scope of this course includes the use of mathematics in management problems, especially decision making based on simple mathematical modeling of real problems.

Study Material: Introduction to operational research and its role in industry, decision making and optimization using graphical methods, formulation of descriptive problems into linear formulations using linear programming, use of simplex algorithms, duality and its use to solve linear programming problems, sensitivity analysis, transportation.

UV141113 LEADERSHIP

Description: This course helps students to explore potential leadership abilities in groups and individually as well as demonstrate them. Students will learn various concepts and theories of leadership, as well as various approaches in personal and group leadership development.

Study Material: Definition, purpose of leadership function, Management and Organization, Leadership Characteristics, Management Models, Organizational Theories, Forms of Organization, Organizational Structure, Manpower Needs in Every Process.

TP141240 FUNCTIONAL FOOD

Description: This course is an elective course that discusses the definition of functional food, distribution and formulation of functional food, free radicals and degenerative diseases, bioactive components in functional food including antioxidants, *dietary fiber*, phytochemicals, probiotic bacteria, prebiotic components, functional effects of each bioactive component for body health, and formulating functional food based on local food.

Study Material: Knowledge of the definition of functional food compared to ordinary and nutritional food; Knowledge of the distribution and formulation of functional food; Understanding of free radicals and degenerative diseases; Understanding of bioactive components in functional food which include antioxidants, diatary fiber, phytochemicals, probiotic bacteria, prebiotic components; Knowledge of the effects of functional food on the environment.

functional of each bioactive component for body health' Functional food formulation design

TP141243 FOOD BIOTECHNOLOGY

Description: This course is an elective course that discusses the definition of biotechnology, the history of biotechnology, the benefits of biotechnology, the differences between conventional and modern biotechnology, genetics, genetic engineering, biotechnology applications in the food industry, transgenic analysis, introduction to bioinformatics, and bioethics.

Study Material: History of biotechnology development, conventional and modern biotechnology, genetics, gene expression regulation (operon), DNA replication, transformation of genetic material, DNA isolation, polymerase chain reaction (PCR), DNA gel agarose electrophoresis, DNA sequencing, genetic engineering, transgenic analysis, bioethics.

TP141244 FLAVORING TECHNOLOGY

Description: This course is an elective course that discusses the scope and types and benefits of flavor in food, which includes the extraction of flavor, the formation of natural flavor in fruits and vegetables, changes in flavor due to fermentation and non-enzymatic browning processes, the formation of flavor in cheese and chocolate meat, the manufacture and application of synthetic flavors in food and beverage products, flavor contamination, and flavor legislation.

Study Material: Biogenesis of natural flavors in fruits and vegetables, flavor changes due to fermentation and non-enzymatic browning processes, flavor formation in meat, cheese and chocolate, manufacture and application of synthetic flavors in food and beverage products, flavor contamination, and flavor legislation.

TP141145 FOOD PRODUCT DEVELOPMENT

Description: This course is a compulsory course that discusses the scope, idea generation, market research, product quality planning and design, implementation and evaluation in the development of a food product as well as economic aspects, engineering in new product development, business aspects and market opportunities in new product development and food product application planning. Changes in the business environment that require new product development, socio-cultural aspects in society, consumer behavior studies, consumer research, new product development management principles, new product design, technology and engineering in new product development, business aspects in new product development which includes financial forecasting and market opportunities for new product development.

Study Material: Definition and importance of food product development, stages and factors affecting food product development; Product development concepts and ideas; Risks in new product development; Quality and product development functions; Marketing developments and marketing strategies; Product specifications and standardization; Competitive evaluation and identification; Marketing mix and product cycle; Determining customer value.

TP141146 SENSORY EVALUATION

Description: This course is a compulsory course that discusses sensory quality, sensory properties of food ingredients, selection of panelists, laboratory preparation, data analysis and decision making, and selection of sensory tests (conventional and modern) that are appropriate for application in the food industry.

Study Material: Knowledge of sensory quality, sensory properties of foodstuffs, selection of panelists, laboratory preparation, data analysis and

decision-making, as well as the selection of appropriate sensory tests to be applied in the food industry.

Practicum: Organoleptic test preparation, panelist selection, sample preparation, stimulus threshold test, pair-wise discrimination test, triangle, duotrio, description test, ranking test, scoring test, pair-wise comparison test, plural comparison test, hedonic test.

TP141147 FOOD SAFETY AND SANITATION

Description: This course is a compulsory course that discusses the principles of food safety and food sanitation, types and sources of contaminants and how to deal with them, types and sources of allergens, the application of aspects of food safety and sanitation in the food industry (through the application of GMP and SSOP, sanitation of personnel, equipment, processing rooms, and the factory environment, to distribution and storage), cleaning and disinfection materials, food inspection, and food poisoning, as well as food safety management systems (HACCP, FSMS, and ISO).

Study Materials: General concepts of food safety and sanitation, including emerging issues and impacts; Types and sources of contaminants and how to deal with them; Allergies and allergens, as well as their mechanisms and relationships with food; The role of water, cleaning agents, and sanitizers in the food industry; Application of GMP and SSOP concepts; Requirements and procedures for sanitizing workers (food handlers); Application of sanitation and hygiene principles in various food industries; Definition of losses, urgency and challenges related to food safety; Sources of food safety problems and burdens, foodborne diseases, and food poisoning outbreaks; Food-borne diseases and bacterial food-borne diseases (Part 1); Bacterial food-borne diseases (Part 2); Non-bacterial food-borne diseases; Food safety management system; Analysis and evaluation of food safety hazard sources and solutions in MSME products.

TP141148 PACKAGING AND STORAGE

Description: This course contains the properties and manufacturing processes of metal packaging, plastic, wood, glass cartons, active packaging, principles of determining the shelf life of food, the role of warehouses in food storage, post-harvest pests, and integrated pest control.

Study Material: Metal packaging, plastic, wood, glass carton, active packaging, principles of determining the shelf life of food, the role of warehouses in food storage, post-harvest pests, and integrated pest control.

TP141149 PROCESSING INDUSTRY DESIGN

Description: The processing industry design course discusses market research, process outline and equipment, space and layout.

Study Material: Market research, plant siting, capacity and process selection, mass balance, process equipment specifications, material handling, food processing industry design concepts, food processing industry layout and area requirements, utilities, economic evaluation, organizational structure.

TP141212 FOOD SERVICE INDUSTRY

Description: This course is an elective course that discusses menu *planning* and *precosting*, determining menu standards, food menu production including preparation, serving, and processing. It also discusses location planning, licensing, facilities, equipment, purchasing, receiving materials, storage, dispensing materials, distribution and marketing. Apart from that, it discusses the application of the principles of safety and sanitation, GMP, HACCP application, halal certification in the food service industry.

Study Material: Introduction to the food service industry definitions, types and prospects of the food service industry, planning and precosting menus, determining menu standards, food menu production including preparation, serving, and serving.

Processing. It also discusses location planning, licensing, facilities, equipment, purchasing, receiving materials, storage, dispensing, distribution and marketing. In addition, it discusses an introduction to the principles of halalan and thoyyibah, sanitation, GMP, the application of HACCP in the food service industry.

TP191250 SPICES AND SEASONINGS TECHNOLOGY

Description: This course is an elective course that discusses the chemical components contained in spices and seasonings, the function and role of bioactive components of spices for health. Spice processing technology is also explained related to extraction techniques, oleoresin, essential oils, spice quality problems, handling and processing of several types of spices with high economic value.

Study Material: Types, characteristics and post-harvest handling of spices; Quality control in the spice trade; Biactive compounds in spices and their changes during processing; Types and roles of spices as flavorings, color providers, complements and accompaniments to dishes; Aspects of production, and quality control of essential oils; Aspects of production, and quality control of oleoresins; Applications of essential oils and oleoresins for food and non-food.

TP191251 BAKERY TECHNOLOGY

Description: This course discusses the definition, types and prospects of bakery products, the fermentation process, knowledge of ingredients, types of dough, types of bread making techniques and recipes, and processing preparation including the tools used, product development through various analysis of basic ingredients and recipe development, market development of bakery products, development of packaging and display methods, so that bakery products will be produced that have high quality and meet selling values.

Study Material: Introduction to bakery technology, types and prospects of bakery products, fermentation processes, knowledge of ingredients, types of dough, types of bread making techniques and recipes, and processing preparation including the tools used, product development through various analysis of basic ingredients and recipe development, market development of bakery products, development of packaging and display methods, so that bakery products will be produced that have high quality and meet selling values.

TP191253 LEGUME, CEREAL AND TUBER TECHNOLOGY

Description: This course is an elective course that discusses legume, cereal, and tuber commodities in terms of raw material characteristics, product diversification, processing technology, and final product characteristics.

Study Materials: Types of legumes, cereals, and tubers; Commodities of legumes and tubers: characteristics and postharvest handling; Soy bean derivative product processing technology: soy protein isolate, texturized vegetable protein, analog meat, and other derivative products; Peanut and mung bean derivative product processing technology; Other legume derivative product processing technology; Tuber derivative product processing technology; Cereal commodities: characteristics and postharvest handling; Rice-derived product processing technology; Wheat-derived product processing technology; Corn-derived product processing technology; Sorghum-derived product processing technology, and some other cereal products; Noodle technology (wheat and non-wheat noodles, vermicelli, and rice noodles).

TP191252 SUGARCANE PROCESSING TECHNOLOGY

Description: This course is an elective course that discusses the profile of sugarcane commodities, post-harvest handling, processing of sugarcane and its by-products for food. Learn about the quality standards of processed sugarcane products and their by-products.

Understand the critical points of sugarcane processing

into sugar and its derivatives. Study the types and forms of cane sugar and its application in food products (*raw* sugar, white crystal sugar, refined crystal sugar, *liquid sugar*, *brown sugar*, *invert syrup*).

Study Material: Processing of sugarcane and its by-products for food. Quality standards for processed sugarcane products and by-products. Critical points of processing sugarcane products into sugar and its derivatives. Studying the types and forms of cane sugar and its application in food products. Development of the sugarcane industry in Indonesia, technology of tools and machinery for sugarcane processing, nutritional content of cane sugar and by-products, damage to cane sugar and quality control of cane sugar, packaging and storage technology of cane sugar products and by-products, utilization and management of cane sugar production waste, cane sugar by-products (MSG, Single Cell Protein and Ethanol).

TP141211 COFFEE, TEA AND COCOA PROCESSING TECHNOLOGY

Description: This course is an elective course that discusses coffee, tea, and cocoa processing technology (starting from harvesting systems, post-harvest handling, processing, quality control, product development, packaging and labeling).

Study Material: Knowledge of types of coffee, types of tea and types of cocoa in Indonesia; Knowledge of methods of harvesting/picking coffee, tea and cocoa commodities; Knowledge of coffee bean processing; Understanding of ground coffee processing; Knowledge of industrial scale tea processing and tea packaging methods; Knowledge of process methods and development of cocoa processing processes in Indonesia; Knowledge of cocoa powder processing technology; Knowledge of cocoa derivative processing technology.

TP191249 FOOD ARCHIPELAGO

Description: This course discusses the history of archipelago food from social, cultural, economic aspects; eating culture of Indonesian people; western Indonesian cuisine, central Indonesian cuisine, eastern Indonesian cuisine, development of archipelago food that has the potential to become functional food, and basic molecular gastronomy of food processing.

Study Material: Archipelago food as national identity (state defense values), History of Indonesian cuisine from the royal era and its development from time to time, Western, Central, Eastern Indonesian cuisine (history, recipes, processing technology), Development of archipelago food into functional food (traditional fermented products and authentic herbal products), Development of archipelago food that has the potential to be developed on an industrial scale (seasoning and spice technology, preservation technology, storage and packaging technology), Basics of molecular gastronomy.

UV141115 REAL WORK STUDY

Description: The implementation of KKN is intended to train students' ability to recognize real problems in the community, organize and work in groups, develop activity plans, manage the provision and use of resources, and work for the community.

Study Material: This course includes an explanation of the subject matter that students must master before participating in activities at the KKN location. The material provided according to the scientific field will be given in the faculty briefing which includes the competency areas of the study program / department in dealing with various community problems in the KKN location as outlined in the scientific program. Students are also expected to be able to collaborate with other departments to make

multidisciplinary program in solving problems i n the community.

FT141108 FIELD WORK PRACTICE

Description: Train students' ability to learn directly in production units or processing of food and agricultural products. Students witness firsthand the application of processing technology in commercial business units, interact with various parties at the practical work location, critically observe the overall operation of the processing unit, recognize technical problems that arise, and compile implementation reports systematically and thoroughly.

Study Material: Preparation and search for PKL partners, PKL administration, communication with partners, PKL debriefing; Search for scientific literature as a theoretical basis for implementing PKL; Preparation of PKL proposals; PKL implementation at partners; Interpretation and analysis of the results of observations and special assignments at PKL partners; Presentation of PKL in scientific writing; Oral presentation of PKL results.

TP141150 THESIS

Description: The implementation of the thesis is intended to sharpen critical and analytical thinking skills in formulating problems related to the application of food science and technology, challenging creativity in determining alternative problem solving, practicing a scientific approach to strengthen self-learning skills from various sources.

Study Material: Determination of thesis topic, Search for scientific literature as a theoretical basis in development, or design, or research for thesis, Preparation of background, problem formulation, objectives, thesis benefits, Preparation of literature review, Preparation of methods, Implementation of data collection for research or internship, or implementation of development for thesis.

entrepreneurship, or testing technological design work, Data analysis and processing, Data interpretation

TP220476 DIVERSITY AND MULTICULTURE

Description: This course emphasizes the content of tolerance, diversity and peaceful dialogue across religions, cultures and beliefs. This course aims to make students understand and live diversity in the context of Bhinneka Tunggal Ika, reflect on biases such as stereotypes and prejudices in diversity relations and build empathic understanding of others.

Study Material: This course contains discussions on: the concept of culture, cultural characteristics, cultural elements, cultural forms, cultural institutions, national and global culture, intercultural communication, multicultural education, moral education, outlook on life, the concept of mutual cooperation, and tolerance.

TP220475 TEAMWORK

Description: This course discusses the ability to build effective teams to manage various activities through learning stakeholder identification, mapping stakeholder values and interests, and communication strategies.

Study Material: In this course, students will learn how to build effective teams through various strategies such as: stakeholder identification, stakeholder values and interests, stakeholder influence strategies, team communication strategies.

TP220474 CONSUMER BEHAVIOR

Description: This course discusses the problem of consumer behavior in choosing a particular product. This course contains concepts and ways to understand consumer behavior, factors that influence consumer behavior to develop marketing strategies, types of consumers and market segmentation, theories of consumer behavior and market segmentation.

about consumer decision making, marketing strategies, consumerism, consumer protection laws, business ethics and corporate social responsibility.

Study Material: In this course, students will study and implement the concepts of consumer behavior, consumer motivation, consumer personality, consumer perception, consumer attitude, the concept of reference group and family influence, the influence of social class, the influence of culture and sub culture, the consumer decision-making process, consumer communication, integrated marketing communication strategies, the influence of advertising, sales promotion, special events and public relations, direct marketing and public relations.

TP220457 PUBLIC RELATIONS

Description: Public relations course is a course that studies the functions and duties of public relations in an organization, institution, company, and government. The public relations function is a part that always communicates to parties inside or outside the organization, both within the local, national and global scope.

Study Material: The history of public relations in the world and Indonesia The nature of public relations The difference between public relations and other fields of study Public and public opinion Work programs and communication patterns of public relations Publication media in the field of public relations Government public relations Information disclosure Internal and external media Image planning and public relations goals Public relations etiquette and protocol.

TP220460 EXTENSION SCIENCE

Description: This course is an elective course that studies extension strategies and methods (determining themes, objectives, methods, principles and extension materials), ethics and evaluation of their implementation.

Study Material: Definition and role of extension science, extension methods and strategies, extension ethics, communication methods, making extension materials and proposals.

TP220463 INNOVATION AND CREATIVITY

Description: The innovation and creativity course discusses the concepts of innovation and creativity, the basics of creative ideas, finding creative ideas, implementing ideas into innovative products, and evaluating innovative products.

Study Material: Basic concepts of creativity and innovation, generating creative ideas, actualizing creative ideas into innovative products, and evaluating and making continuous improvements to innovative products.

TP220470 FOOD ENTREPRENEURSHIP

Description: This course is an elective course in the soft skills cluster that studies the basic concepts of entrepreneurship, entrepreneurship development in the scope of food technology, business planning, and evaluation of entrepreneurial activities that have been carried out.

Study Material: In this course, students will learn about the basic concepts of entrepreneurship, entrepreneurship development in the scope of food technology, the nature and behavior of entrepreneurs, ideas and opportunities in food entrepreneurship, analysis of business forms and profiles, business planning, business feasibility analysis, consumer/customer studies and their behavior, market and competitor analysis, risks of a business, and evaluation of entrepreneurship that has been carried out. The output of this course can be in the form of entrepreneurship analysis or entrepreneurship *plan* (*business plan*) in the scope of food.

TP220459 COMMUNICATION

Description: This course is an elective course that studies the concepts and theories of communication which include, the importance of communication in human life, the scope of communication between humans, and the development of communication science; models and varieties of communication; listening skills; verbal and nonverbal communication; perception formation process; personal communication and intergroup communication; organizational communication, *public speaking* skills, and the development of communication science and technology in Indonesia.

Study Material: The urgency of communication in human life, the scope of communication between people, and the development of communication science; Models and varieties of communication; Listening skills; Verbal and nonverbal communication; Perception formation process; Personal communication; Intergroup communication; Organizational communication Public speaking skills The development of communication science and technology in Indonesia.

TP220469 SCIENTIFIC COMMUNICATION

Description: This course is an elective course that studies effective scientific communication strategies, composes scientific work in writing, and conveys the results of scientific work in official (seminar or conference) and unofficial (*talk show*) scientific presentation activities.

Study Material: In this course, students will learn and implement basic techniques/methods to communicate scientific topics in various formats in various forums. The communication forums that are trained are scientific and popular scientific forums such as scientific writing in journals and scientific writing in popular media (newspapers and magazines). Students will also learn and practice techniques for conveying information on the results of scientific work in official forums (seminars or conferences) and

unofficial forums (*talk shows*).

TP220473 EVENT MANAGEMENT

Description: This course provides knowledge about event management, including concepts and practices in planning and managing an activity.

Study Material: Event concept to convey messages to audiences; event promotion media; mapping of human resource needs and event budgets; risk management of opportunities that may occur at an event; event planning, execution and evaluation.

TP220462 ORGANIZATION AND MANAGEMENT

Description: The organization and management course discusses the basic concepts of organization and management which include the basic concepts of organization, organizational design, organizational design, organizational processes, conflict and stress management, communication in organizations, organizational management and organizational development.

Study Material: Basic concepts of organization and management; organizational structure; organizational culture and values; job design; conflict and stress management, communication, management and organizational development.

TP220472 DIGITAL MARKETING

Description: This course is an elective course in the soft skills cluster that will provide students with the ability to understand marketing concepts and strategies through *internet-based* applications.

Study Material: In this course students will learn about the concepts and practices of identifying marketing potential through the use of *internet-based applications* such as *e-commerce* and *e-marketplace*, concepts and business models in the digital marketing era, technology related to *webstores* and *open marketplaces*.

cart, as well as techniques for marketing a commodity or product through internet-based applications

TP220458 COMMUNITY DEVELOPMENT

Description: This course explains the theoretical basis for community development related to the context of community development analysis and action in the field by understanding the background and understanding of community development; various issues in community development; basic principles of community development; holistic and integrated community development approaches; and principles for implementing community development action. After taking this course, students will be able to understand the philosophy of community development and its position in development theories; analyze and diagnose the actual conditions of a community in the context of community development; understand the principles and approaches in community development; and determine community development approaches that are relevant to the actual conditions of various communities.

Study Material: Definition, scope, objectives, and elements of community development, Forms and principles of community development, Stages in community development, Community organization, Mobilization and optimization of cadres in community development, Participation and non-formal education for community development, Socio-cultural changes, and *Focus Group Discussion* (FGD).

TP220467 TALENT AND PROFESSIONAL DEVELOPMENT

Description: Talent and professional development courses study and teach students to be able to understand their potential (strengths and weaknesses) so that they are able to do clear *goal setting* and have the ability and skills in communication and leadership. In the end

Maximum potential development can build character, professionalism in students to produce achievements at local, national or international levels.

Study Material: In this course students will learn and implement intrapersonal potential & *self awareness*, how to build habits, be positive and become a proactive individual, determine *goal setting,* be able to lead and cooperate with others, and communicate in oral and written form.

TP220461 PARTICIPATORY PLANNING AND EVALUATION

Description: This course discusses the position of planning and evaluation in community development programs and the relationship between the two; the correct way to evaluate community development programs/projects in a participatory manner; and how to prepare a participatory community development program plan.

Study Material: Students analyze the social situation of the community including programs formed in a participatory manner; use community extension and mentoring techniques from planning to program evaluation; design community program evaluations to build alliances (build networks), implement activities for capacity building (training, promotion, and marketing), organize groups, organizations, and communities; and make decisions based on data and information analysis.

TP220471 BUSINESS STRATEGY

Description: This course is an elective course in the soft skills cluster that will provide basic skills and understanding related to strategy in business from scope to strategy implementation, as well as policies in business.

Study Material: In this course students will learn about business concepts and policies, the importance of vision, mission goals and strategies for a company, evaluation of the company's external environment, company resources, and company capabilities and competitiveness, the concept of five genetic competitive strategies, evaluation of the company's competitive position, strategies to compete in international markets, and the concept of managing a business using the best strategic considerations.

TP220465 PUBLIC HEALTH MANAGEMENT TECHNOLOGY

Description: This course is an elective course that studies the concept of public health science, the concept of health, illness and disease prevention in society, innovation and engineering of appropriate technology to improve public health.

Study Material: In this course students will learn and implement the concepts of public health science, the concepts of health, illness and disease prevention in the community, conduct surveys and public health data collection, develop innovation plans and appropriate technology engineering to improve public health. The community health improvement activities referred to are innovation and engineering of appropriate technology to improve public health, such as clean water treatment, household waste management, waste management, making nutritious food products.

CHAPTER 4
INDEPENDENT CAMPUS LEARNING

1.1 INTRODUCTION

In order to prepare students to face social changes, culture, the world of work and rapid technological advances, student competencies must be prepared to be more in line with the needs of the times. *Link and match* is not only with the industrial world and the world of work but also with the rapidly changing future. UPN "Veteran" East Java as a university is required to be able to design and implement innovative learning processes so that students can achieve learning outcomes covering aspects of attitude, knowledge, and skills optimally and always relevant.

The learning process and the concept of Merdeka Belajar - Kampus Merdeka (MBKM) are expected to be the answer to these demands. The Merdeka Campus is implemented in order to realize an autonomous and flexible learning process in higher education to fulfill the right to study three semesters outside the study program, namely in the form of 1 semester of opportunity to take courses outside the study program and 2 semesters to carry out learning activities outside the college.

In order to support the MBKM program, PS-TP provides implementation facilities for students in the implementation guidelines prepared at the study program level. The forms of MBKM activities that can be carried out include internships / work practices in industry or other workplaces, carrying out community service projects in villages, participating in student exchanges, conducting research, conducting entrepreneurial activities, and making independent studies / projects. Merdeka Learning Independent Campus is expected to provide contextual field experiences that will improve student competence as a whole, ready to work, or create new jobs.

The implementation of the Merdeka Belajar - Kampus Merdeka program in the Food Technology Study Program, Faculty of Engineering, UPN "Veteran" East Java is:

1. Providing the right to study three semesters outside the study program to improve graduate competencies, both *soft skills* and *hard skills*, to make them more relevant to the demands of the times.
2. Preparing graduates as future leaders of the nation who have superior personality and character as the hallmark of the State Defense campus.
3. Realizing cooperation activities between universities and non-universities, government and private sectors that are implemented in the form of education, research and community service.

1.2 FORM OF ACTIVITY

Figure 1. Forms of learning activities for independent learning - independent campus

The form of learning activities in the independent learning program - independent campus is in accordance with Permendikbud No. 3 of 2020, Article 15 paragraph 1. Learning can be carried out within the study program and outside the study program which includes eight programs consisting of student exchanges, internships / work practices, teaching assistance in educational units, research / research, humanitarian projects, entrepreneurial activities, independent studies / projects, and building villages / thematic real work courses. PS-TP provides opportunities for

students to carry out 6 out of 8 programs. The purpose of this restriction is so that MBKM activities remain in accordance with the competencies of PS-TP graduates.

1.2.1 Student Exchange

The form of student exchange in the Food Technology Study Program consists of two programs, namely PERMADI (lecture program between study programs at UPN "Veteran" East Java); PERMATA PANGAN (lecture program in the same study program outside UPN "Veteran" East Java).

2.1.1 PERMADI

PERMADI is a form of student exchange program between study programs at UPN "Veteran" East Java. In the PERMADI program, students of the Food Technology Study Program are given the opportunity to take courses in other study programs at UPN "Veteran" East Java.

2.1.2 FOOD EQUIPMENT

PERMATA PANGAN is a form of student exchange program from the same study program outside the UPN "Veteran" East Java campus. Students of PS-TP UPN "Veteran" East Java can enrich the knowledge and experience and scientific context obtained by the Food Technology and Agricultural Products Study Program from other universities that have uniqueness or a vehicle to support learning to optimize Graduate Learning Outcomes (CPL).

1.2.2 Internship/Work Practice

The internship/work practice program provides an opportunity for PS-TP UPN "Veteran" East Java students to conduct *experiential learning* in the workplace. During the internship, students will gain *hard skills* (skills, *complex problem solving*, *analytical skills*, etc.), as well as *soft skills* (professional/work ethics, communication, cooperation, etc.). Meanwhile, the industry gets talents who, if suitable, can be directly recruited, thus reducing recruitment and initial training/induction costs. Students who already know the workplace will be more stable in entering the world of work and their careers. Through this activity, industry problems will flow to universities so as to update the workforce.

teaching and learning materials and research topics in higher education will be more relevant.

The PS-TP internship program can be taken by students for a minimum of one semester and a maximum of two semesters organized through collaboration between PS-TP and partners such as the food industry, government institutions, *startups*, or other agencies. In addition, the implementation of internship / work practice programs can also be organized through cooperation between the Ministry of Education and Culture and partners such as certified internship and independent study programs (MSIB) and Matching Fund.

1.2.3 Research

For PS-TP students who have an interest in becoming researchers, independent campus learning can be realized in the form of research activities at research institutions / study centers. Through research, students can build a critical way of thinking, to explore, understand, and be able to do research methods better. Laboratories / research institutions sometimes lack research assistants for short-term research projects (1 semester - 1 year), so this is an opportunity for students.

1.2.4 Entrepreneurial Activities

According to the Global Entrepreneurship Index (GEI) in 2018, Indonesia only scored 21% of entrepreneurs from various fields of work, or ranked 94 out of 137 countries surveyed. Meanwhile, according to research by IDN Research Institute in 2019, 69.1% of millennials in Indonesia have an interest in entrepreneurship. Unfortunately, the entrepreneurial potential for the millennial generation has not been well managed so far. Merdeka Campus Policy encourages the development of students' entrepreneurial interests with appropriate learning activity programs. PS-TP students can take advantage of the entrepreneurship program to develop businesses in the food sector that they have while doing off-campus learning which can be converted into 20 - 40 credits for 1 - 2 semesters.

1.2.5 Independent Study/Project

Many students have the interest and desire to realize internationally competitive masterpieces or work on innovative ideas. Ideally, independent studies/projects are run to complement the curriculum that students are already taking. Colleges or faculties can also make independent studies to complement topics that are not included in the lecture schedule, but are still available in the syllabus of the study program or faculty. Independent project activities can be carried out in the form of interdisciplinary group work.

1.2.6 Village Development/KKN

Bina Desa/KKN is a form of education by providing learning experiences for students to live in the community outside the campus, who directly together with the community identify potential and handle problems so that they are expected to be able to develop village / regional potential and concoct solutions to problems in the village. Bina Desa/KKN activities are expected to hone the *soft skills of* partnership, interdisciplinary / scientific teamwork (cross-competency), and student leadership in managing development programs in rural areas.

The implementation of Bina Desa/KKN is carried out to support cooperation with the Ministry of Villages and other Ministries/Stakeholders. The government through the Ministry of Village PDTT distributes village funds of 1 billion per village to a total of 74,957 villages in Indonesia, which based on the 2019 Village Development Index (IDM) data, there are 6,549 very underdeveloped villages and 20,128 underdeveloped villages. The implementation of Bina Desa/KKN is carried out in very underdeveloped, underdeveloped and developing villages, whose human resources do not yet have the ability to plan development with these large funding facilities.

1.3 PROGRAM IMPLEMENTATION

The implementation of MBKM PS-TP UPN "Veteran" East Java activities can be taken for 6 months (one semester). For students who take the MBKM-program for 6 months, the maximum credit load that can be equalized is

is 20 credits. Equalization of the number of credits with MBKM PS-TP activity time, namely:

Total activities 1 credit = 170 minutes/week/semester;
or
2,720 minutes/semester
or
45 hours/week/semester.

The criteria, stages, implementation requirements and systematics of the assessment of the MBKM PS-TP program are explained in more detail in the MBKM GUIDE BOOK OF THE FOOD TECHNOLOGY STUDY PROGRAM. Furthermore, more detailed implementation instructions are explained in the JUKNIS MBKM PROGRAM STUDY OF FOOD TECHNOLOGY for each activity program.

CHAP
TER 5 LEARNING SIGNS AND SYSTEMS ASSESSMENT

The learning system is built based on planning that is relevant to the objectives, learning domains, and their hierarchy. Learning is carried out using various challenging strategies and techniques, encouraging students to think critically, explore, create, and experiment by utilizing various sources. The implementation of learning has a mechanism to periodically monitor, review, and improve lecture activities (attendance of lecturers and students), preparation of lecture materials, and assessment of learning outcomes. Lecture SOP, PBM is prepared to ensure that the lecture process can run well in accordance with applicable regulations. The mechanisms included in the SOP include:

1. Every lecturer when giving lectures is required to fill in attendance and lecture material titles on the lecturer information system (SIDOS) account with the link https://sidos.upnjatim.ac.id/login.asp. Lecturer attendance is recorded on the "Lecture and Teaching Attendance" menu in SIDOS by clicking the "start" button to start the lecture which is then continued by filling in the lecture material according to the Lecture Program Unit (SAP) and "end" to end the lecture and fill in student attendance.
2. If the lecturer is unable to attend according to the specified schedule, the lecturer must report to the education and teaching department (DIKJAR) to change the agreed lecture schedule, so that it can be recorded on SIDOS.
3. The Study Program Coordinator (korprodi) will evaluate the attendance of teaching lecturers in mid-semester, so that lecturers who have not met the number of meetings according to the academic calendar can make improvements.
4. At the end of each semester, monitoring is carried out by the quality assurance team of the study program regarding student satisfaction with each course.

lectures and the Teaching and Learning Process (PBM) of the course instructor.

5. Lecturers or teachers provide an assessment of student activities during PBM.
6. Periodically, an Internal Quality Audit (AMI) is conducted by the University level quality assurance team.

Mechanism for preparing course materials:

1. Lecturers or teachers are authorized to develop teaching materials by involving lecturers who have similar fields of science.
2. In the preparation of this teaching material, a team of cognate lecturers is tasked with examining the suitability of the teaching material with the SAP syllabus and course competencies.
3. In courses conducted by *team teaching*, there must be coordination of teaching materials and lecture times.

Monitoring and evaluation of lecturers in learning recorded in SIDOS is used for the assessment of Lecturer Performance Load (BKD) at the end of the semester through the Integrated Resource Information System (SISTER) platform with the link http://sister.upnjatim.ac.id/auth/login .

1. Eligibility for the End of Semester Examination

At the end of each lecture and practicum period, an end-of-semester exam is held. This semester final exam is one component of academic assessment to obtain the final grade of a course. The requirements for taking the Final Semester Examination are as follows:

a. Students who have registered to take certain courses (authorized in KRS)
b. Total student attendance must be ≥ 75% of the total lecturer teaching attendance
c. Have paid SPP installments as stipulated

2. Assessment Composition

2.1 ***Non-Project Based Learning*** **Course**

a. Midterm Grade (NTS) consists of:
   Attendance : 10%
   Quizzes/Assignments : 30%
   UTS : 60%
b. The Final Semester Grade (AS)
   consists of: Attendance: 10%
   Quizzes/Assignments: 30%
   UAS: 60%
c. Final Grade (NA) = (NTS + NAS) / 2

2.2 *Project-based learning* course

Project activities : 20%
Project results : 30%
Quiz : 10%
Tasks : 10%
UTS : 15%
UAS : 15%

3. Final Rating Scale :

Final Rating Scale: VALUE	**LETTER VALUE**	**BOBOT**
≥ 80 - 100	A	4,00
≥ 76 - <80	A -	3,75
≥ 72 - <76	B +	3,50
≥ 68 - <72	B	3,00
≥ 64 - <68	B -	2,75
≥ 58 - <64	C +	2,50
≥ 54 - <58	C	2,00
≥ 50 - <54	C -	1,75
≥ 46 - <50	D +	1,50
≥ 42 - <46	D	1,00
00 - <42	E	0,00

4. Provisions for KKN, PKL and SKRIPSI

During their studies, students of the Faculty of Engineering are required to do Community Service Program (KKN), Field Work Practice (PKL) and Thesis. Students can program these activities if they have accumulated 100 credits for KKN, 110 credits for PKL and 136 credits for Thesis. Detailed provisions on matters related to KKN, PKL and Thesis are contained in the KKN, PKL and Thesis Guidebook.

5. Study period limit and *drop out* (DO)

a. The study period limit for undergraduate programs (strata-1) is 7 years or 14 semesters
b. Drop out (drop out = DO)

A student is declared to have dropped out of study (DO), if he/she does not meet the academic requirements within the study period / duration according to the applicable provisions so that he/she is not allowed to continue his/her studies and must leave the Faculty or study program concerned.

Things that cause dropping out of study (DO) are :

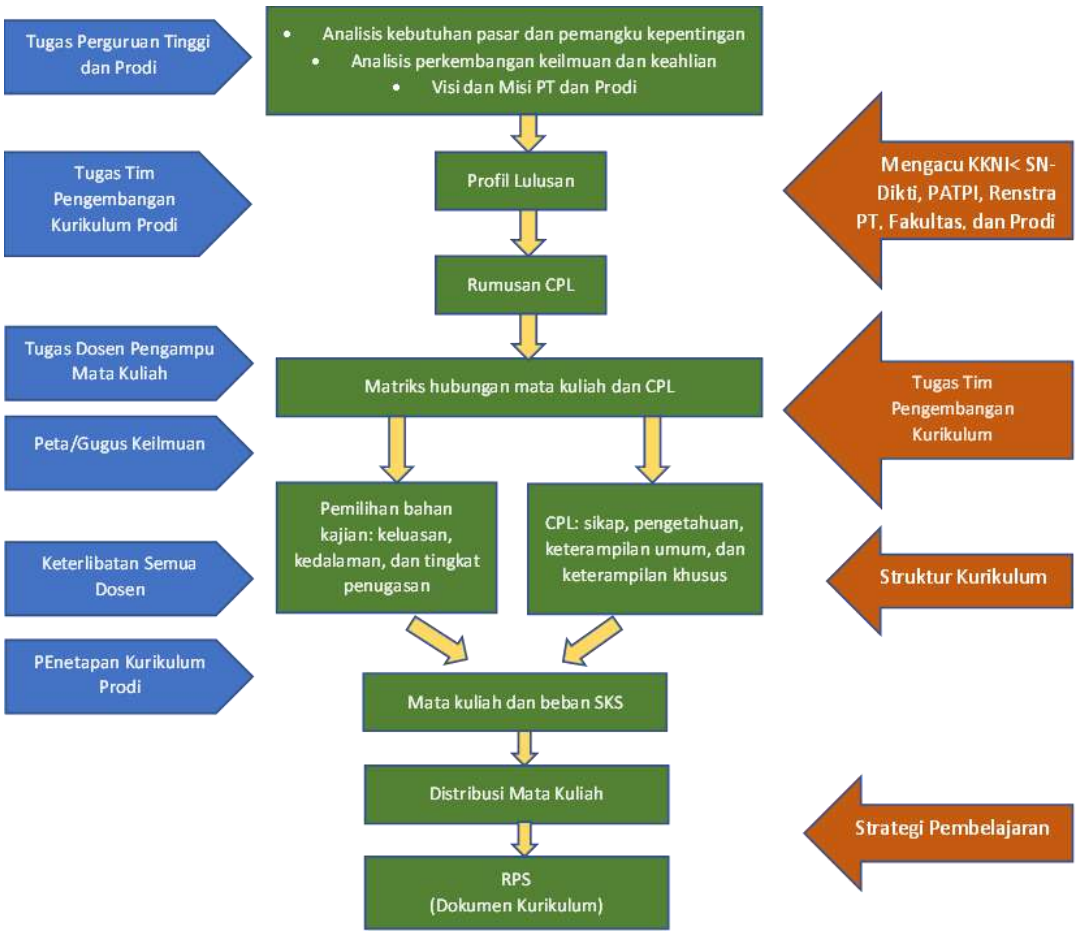
1. Exceeding the maximum study period limit of more than 7 years (14 semesters)
2. Not achieving the minimum number of credits within certain study period limits as follows:
   - At the end of 4 (four) semesters has not been able to collect at least 36 credits and GPA less than 2.00. In the event that the number of credits obtained is more than 36 credits and the GPA is less than 2.00, the GPA calculation is based on the lecture period with the best grade of 36 credits. **16 |** FT Academic Guide - UPN "Veteran" East Java
   - At the end of 8 (eight) subsequent semesters have not been able to collect at least 110 credits and GPA less than 2.00. In the event that the number of credits obtained is more than 110 credits and the GPA is less than 2.00, the GPA calculation is based on the lecture period with the best grade of 110 credits**.**

In every course taken in the Food Technology Study Program, grades ≤ C- are not allowed and if students get a grade ≤ C- they are required to repeat the course.

CHAPTER 6
CURRICULUM EVALUATION AND LEARNING

6.1 CURRICULUM AND LEARNING EVALUATION

The stages of curriculum design of the Food Technology Study Program at the Faculty of Engineering of UPN "Veteran" East Java refer to the Indonesian National Curriculum Framework, Regulation of the Minister of Education and Culture of the Republic of Indonesia Number 49 of 2014 concerning National Higher Education Standards, as well as the Strategic Plan of Higher Education, University, and Study Program (**Figure 2**). The explanation of the flowchart for the design and evaluation of the Food Technology PS curriculum at the Faculty of Engineering UPN "Veteran" East Java is as follows.



Flowchart of curriculum design and evaluation of Food Technology PS Faculty of Engineering UPN "Veteran" East Java

6.2 INPUT FROM VARIOUS *STAKEHOLDERS*

PS Food Technology, Faculty of Engineering, UPN "VETERAN" East Java formulates a vision and mission that reflects the vision and mission of the Faculty and University. The vision and mission become the basis for the preparation of the learning curriculum at the Food Technology Study Program which refers to the Curriculum Standards made by the Indonesian Association of Food Technologists (PATPI). The learning curriculum at the Food Technology Study Program also refers to input obtained from various stakeholders, such as industry, state-owned and private enterprises, government agencies, and the community. The formulated curriculum will be evaluated periodically (5 years) based on the academic situation and conditions.

1. Evaluation of Academic Learning Activities from Internal and External Parties

   This evaluation is held at least once a year to collect input from internal and external parties. Internal parties are the academic community of the Food Technology Study Program consisting of lecturers, education staff, students, and alumni, while external parties consist of leaders and employees from various industries, state-owned and private enterprises, government agencies, and the community.

2. Curriculum Evaluation

   Based on KKNI, SN Dikti, Renstra Dikti The existing curriculum has been developed based on KKNI, SN Dikti, as well as Renstra from Dikti, University, and Study Program with Graduate Learning Outcomes (CPL) that have been formulated.

3. Curriculum Development Team

   The Curriculum Development Team is appointed by the Food Technology PS Coordinator and authorized through an assignment letter by the Faculty. The task of the Curriculum Development Team is to accommodate the entire process of preparation and evaluation so that it can run well. The profile of graduates and the formulation of graduate learning outcomes (CPL) are formulated by the Curriculum Development Team and agreed upon by the entire academic community. This team also creates a matrix that connects the

Lectures with SLOs consisting of attitudes, knowledge, general skills, and special skills. This matrix will be the basis for preparing the Learning Plan (RPS) which includes CPMK, study materials, indicators of success, learning methods, SKS weight, assessment weight, and references used.

4. Curriculum structure

   The Food Technology Study Program curriculum consists of University Courses, General Basic Courses, Faculty Courses, Compulsory and Elective Study Program Courses. The curriculum that has been formulated is authorized by the Faculty through a Decree (SK) signed by the Dean of the Faculty of Engineering.

5. Learning Strategy

   The learning strategy is formulated based on the Curriculum Structure of the Food Technology PS by each lecturer who teaches the course as outlined in the RPS. Lecturers also determine course materials, course evaluations (exams and types), and supporting books used. RPS is made as a learning guideline for one semester and can be used and developed in the next period, based on the progress and development of science and technology.

6.3 LEARNING EVALUATION

The provisions concerning the evaluation of learning implementation are as follows:

- Evaluation of success in learning activities can be done in the form of exams, quizzes, assignments and/or case study *reports* or *project-based reports*.
- Examinations are conducted in at least two stages, namely the mid-semester exam (UTS) and the final semester exam (UAS). Determination of the UTS and UAS schedule is adjusted to the academic calendar set by the university.
- The mid-semester exam (UTS) is held at the end of the mid-semester, after approximately half of the learning material has been completed, which is approximately after the lecture has lasted at least 7 times.

- The final semester exam (UAS) is held at the end of the semester, after all learning materials have been completed (after a minimum of 14 face-to-face lectures).
- Incidental evaluation can be done by a lecturer to get feedback on the learning process of the courses he/she teaches.
- Students are only entitled to take the final semester exam if they have taken the mid-semester exam and meet the minimum requirement of 75% attendance in face-to-face meetings, as evidenced by the attendance list.
- The implementation of learning evaluation is part of the responsibility of the quality assurance team. Therefore, supervision of the implementation of the exam must be carried out by the team of lecturers in charge of the course. The faculty provides facilities and logistics for the implementation of the exam, and can help provide additional supervisors if needed. Evaluation of student attendance is the responsibility of the study program and the lecturer in charge of the course.
- The exam questions should be submitted and validated by the Food Technology PS Coordinator no later than three days before the exam to be duplicated by the Food Technology PS.
- Repairs to exam questions during the exam may only be made by the lecturer in charge of the course.
- The exam supervisor has the right to reprimand students who are considered dishonest (cheating) in carrying out the exam and record all events that take place during the exam in the Minutes of Examination Implementation. Additional supervisors are not entitled to make changes to the exam question paper.
- The archiving of exam questions is carried out by the Food Technology Study Program and the lecturer in charge of the course.
- The exam implementation process refers to the Exam Rules formulated by the Food Technology Study Program.

6.4 MONITORING AND EVALUATION METHODS AND INSTRUMENTS

The monitoring and evaluation methods used in this activity are as follows.

- An audience with the Coordinator of Food Technology
- Document check
- Discussion and question and answer
- Field review
- Data and information analysis
- Data verification
- Confirmation of findings
- Recommendation for improvement

Monitoring and evaluation of curriculum and learning is carried out by a team consisting of Auditors (2 people) who are tasked with monitoring and evaluating all lecturers teaching courses at the Food Technology Study Program. The team uses an agreed curriculum monitoring and evaluation instrument. This instrument is needed as a standard in assessing the curriculum and learning evaluation process at the Food Technology Study Program. This M&E instrument contains several aspects and a rating scale in Table 1. The final weight of the assessment uses the final score with a Likert Scale (A-E) with the following information.

A : very suitable 80-100%

B : 75-80% compliant

C : less suitable 60-75%

D : not suitable ≤ 60%

Curriculum and learning evaluation results need to be analyzed based on the following parameters.

1. Curriculum Structure
2. Learning Outcomes

Table 7 Monitoring and Evaluation Form of Food Technology PS Curriculum

No.	Assessment Aspect	Assessment Weight*				Description
		1	2	3	4	
1	The curriculum reflects the vision and mission of the university					
2	The curriculum reflects the vision and mission of the faculty					
3	The curriculum reflects the vision and mission of the study program					
4	The curriculum content shows a good balance between attitudes, knowledge, general skills, and specialized skills					
5	Graduate learning outcomes (ELOs) are clearly formulated in accordance with with the Profile of Food Technology Graduates					
6	The curriculum shows the breadth and depth of the courses					
7	Curriculum shows University Courses, Foundation Courses General, Faculty Courses, Compulsory and Elective Study Program Courses.					
8	Curriculum content is updated in accordance with applicable regulations and policies and in accordance with the standards set by scientific/professional associations and the needs of other *stakeholders*					
9	The curriculum is developed by the lecturers who teach the courses adapt to the development of science and technology.					
10	Curriculum development involves scientific/professional associations and *stakeholder* needs					
11	The curriculum is evaluated every academic year					
12	Student evaluation in accordance with course and curriculum objectives					
13	*Stakeholder* feedback is used to improve the curriculum. measurable (implementation)					

14	Lecturers deliver lectures in accordance with the RPS					

15	Assessment of student abilities in each course is carried out periodically, namely quizzes, assignments, as well as UTS and UAS					
16	Assessment schemes and methods are always quality assured and require continuous improvement					

3. * Number 4 = very suitable; 3 = suitable; 2 = less suitable; 1 = not suitable

CHAP
TER 7
CLOSING

In order to prepare graduates who are resilient in facing social, cultural, world of work, and technological changes that are growing rapidly in the era of the industrial revolution 4.0, student competencies must be strengthened in accordance with existing developments. It is necessary to have a link and match between higher education graduates not only with the business world and the industrial world but also with the future which is changing faster. Based on this, the Faculty of Engineering Study Program, National Development University "Veteran" East Java developed the MBKM Curriculum in accordance with the new policy of the Ministry of Education and Culture in the field of higher education through the "Merdeka Belajar-Kampus Merdeka (MBKM) program. The policy of the Ministry of Education, Research and Higher Education is related to providing freedom for students to take part in learning activities for a maximum of three semesters of study outside their study program and campus.

Thus this guidebook is prepared, hopefully it will be useful for the academic community of UPN "Veteran" East Java and can be used as a reference for the implementation of MBKM, with the hope that the UPN "Veteran" East Java Food Technology Study Program can realize intellectual graduates who are competitive, adaptive, and still uphold the basic values of State Defense.