PROGRAM SPECIFICATION

ENGINEERING IN FOOD TECHNOLOGY PROGRAM

Section A. Admissions/Management Information
1. Title of program
Engineering in Food Technology Program
2. Program code
7540101
3. Vietnam Qualifications Framework level of award
Bachelor - Level 6
4. Cohorts that this program specification is relevant to
2020 - 2024
5. Awarding institution
Nguyen Tat Thanh University
6. Administrative faculty
Faculty of Environmental and Food Engineering
7. Website of program/faculty
Website in Vietnamese: https://kttpmt.ntt.edu.vn/ Website in English: https://kttpmt.ntt.edu.vn/?lang=en
8. Final award title
Degree of Engineer in Food Technology
9. Job titles of graduates
- Food R&D researchers - Specialists controlling and operating food production lines, ensuring food quality and safety - Laboratory technicians/engineers at factories, centers, institutes, and universities. - Traders of food products, additives, and food processing equipment - Controllers or consultants on food safety and hygiene at companies or regulatory agencies.
10. Competency of program graduates
A. Food product development B. Food quality control and assurance C. Food analysis D. Equipment operation E. Connecting people to people

F. Personal competences

G. Qualities and attitudes

11. Admission criteria

The university applies the entry assessment method in four ways:

- Method 1: Consider the results of the National High School Exam.
- Method 2: Consider the results of high school transcripts.
- Method 3: Considering the results of the competency assessment test of Vietnam National University, Ho Chi Minh City.
- Method 4: Direct admission, priority will be given to candidates who have won the National Excellent Student Competition, the National Science and Technology Contest, the Asean and International Skills Competition; selection of foreign candidates who are eligible to study or under the nomination category.

The subject combinations A00 (Mathematics, Physics, Chemistry); A01 (Mathematics, Physics, English); B00 (Mathematics, Chemistry, Biology); D07 (Mathematics, Chemistry, English)

12. Length of program and mode of study

- Number of credits: 151 credits
- Program length: 4 years
- Mode of study: on campus
- Time for enrollment: July - September

13. Language of delivery

Vietnamese

14. Academic quality assurance

- Program stakeholders: businesses, employers, alumni, the univesity, lecturers, and students.
- Feedback mechanism: The Department of Quality Assurance collects comments from stakeholders on an annual basis. The survey data is analyzed, processed to give appropriate improvement direction. All procedures are performed according to PDCA cycles.
- Quality goals: Every year, the faculty proposes quality goals and is conveyed into the training process of the program.
- National accreditation: Institutional accreditation of the Ministry of Education and Training in 2016.
- International accreditation: achieved QS 4-star rating in 2019.

15. Program leaders and recruitment support staff

- Program manager: Dr. Trần Thị Như Trang, ttntrang@ntt.edu.vn, 0909008162
- Program deputy manager: Nguyễn Thị Vân Linh, ntvlinh@ntt.edu.vn, 0903570019
- Student recruitment specialist: Nguyễn Đình Phúc, ndphuc@ntt.edu.vn, 0914488303

Section C. Teaching/learning methods and strategies

16. Internationalization/ globalization

The faculty has strengthened links with domestic and foreign universities and institutes. In the past 5 years, the faculty has signed cooperation agreements with Saigon Food Joint Stock Company, Zennatural Herbal Joint Stock Company, Warrantek Joint Stock Company (Vietnam), Center for Biotechnology in Ho Chi Minh City, and National Polytechnic Institute of Toulouse (France). In 2020, the faculty signed a joint training agreement for a double degree program in Food Technology with Providence University (Taiwan).

17. Program educational objectives (PEOs)

A few years after graduation, graduates can:

- PEO1: Establish, consult, invest, and manage production and business establishments, centers for analysis and management of food quality management in a professional and ethical manner.
- PEO 2: Discover and solve new practical problems, contributing to the advancements of the food technology industry.
- PEO 3: Conduct lifelong learning, improve qualifications and developing a career to become a leader, manager, expert; perform social responsibility and contribute to global sustainable development.

18. Benchmarking

- The program benchmarks the PLOs and curriculum with the Food Technology programs of of Ho Chi Minh City University of Technology, Ho Chi Minh City University of Technology and Education, Oregon State University (USA), Monash University Malaysia (Malaysia).
- The program also benchmarks the PLOs with the ABET student outcomes.

19. Program learning outcomes (PLOs)

Upon completion of the programme, graduates are able to:
Knowledge

PLO 1 (General knowledge)	**Apply** knowledge of mathematics, statistics, the natural sciences, technology, culture, politics, and law, and an understanding of contemporary issues in industry practice	1.1 **Apply** knowledge of mathematics and statistics in industry practice. 1.2 **Apply** natural science knowledge in industry practice. 1.3 **Apply** technology knowledge in industry practice. 1.4 **Apply** political, legal, and an understanding of contemporary issues in industry practice.
PLO 2 (Engineering knowledge)	**Apply** food technology's technical knowledge and principles to solve complex technical problems of food processing, production and quality assurance systems, meeting applicable laws and regulations, limiting incidents and improve food quality.	2.1 **Organize** the food processing process to ensure quality in accordance with current regulations and laws. 2.2 **Monitor** the food processing process to ensure quality in accordance with current regulations and laws. 2.3 **Build** the relationship between the departments in the food production operation system in order to limit the incidents and improve the food quality. 2.4. **Apply** regulations, methods and standards in the management of production and distribution of food products
PLO 3 (Design and development of solutions)	**Develop** food technology solutions and processes that meet specific needs, with consideration of public health, safety and welfare factors, as well as global, cultural, social, environmental, and economic factors.	3.1 **Evaluate** the quality of raw materials and products. 3.2. **Evaluate** the usability of raw materials 3.3. **Evaluate** the manufacturing process to adjust the product formulation. 3.4. **Evaluation** the commercial value of food products 3.5 **Propose** formulas and technological processes to create new food products. 3.6 **Propose** methods and ways to improve the quality of food products.
Skills		

PLO 4 (Thinking skills)	**Apply** critical thinking and creativity in problem solving.	4.1. **Apply** critical thinking in analyzing and evaluating information and data. 4.2. **Apply** critical thinking in analyzing and evaluating arguments. 4.3. **Apply** problem-solving skills including identifying problems, knowing when and how to gather information, and evaluating and selecting information needed for problem solving. 4.4. **Evaluate** different ideas for problem solving 4.5 **Propose** creative ideas for problem solving.
PLO 5 (Communication)	**Communicate** effectively in a variety of contexts.	5.1. **Use** effective verbal communication skills in technical and social settings. 5.2. **Use** written communication skills effectively in technical and social settings. 5.3. **Use** digital and multimedia communication skills effectively in technical and social settings. 5.4. **Use** IT effectively to mine, store and retrieve data. 5.5. **Behave** appropriately with stakeholders in a diverse, multicultural environment. 5.6. Use English at B1 level.
PLO 6 (Teamwork)	**Work** effectively with cross-functional teams in leadership or membership roles.	6.1. **Apply** planning and time management skills during team work. 6.2. **Apply** internal relations skills including establishing connections, resolving conflicts and communicating with the outside in the group's working process. 6.3. **Evaluate** individual and team performance and make continuous improvement.
PLO 7 (Investigation and research)	**Perform** studies and scientific research on	7.1. **Assess** accurately the strengths, weaknesses, similarities and differences of the forms of inquiry and select the appropriate form. 7.2. **Deploy** properly survey and research methods.

	complex issues of the food industry.	7.3. **Reason** based on a solid knowledge base to arrive at logical conclusions.
PLO 8 (Usage of resources, tools and technology)	**Use** efficient data sources, tools and modern technologies for the activities of the food industry.	8.1 **Use** tools, equipment and techniques to analyze the quality criteria of raw materials, goods in process, and finished products. 8.2. **Use** tools and equipment to develop and produce food products 8.3 **Apply** forms to monitor production activities, assess quality, and trace food products
Attitude		
PLO 9 (Ethics and social responsibilities)	**Comply with** laws and regulations, demonstrating an understanding of ethical standards and social responsibility.	9.1 **Comply** with national and international laws and regulations of the food industry. 9.2 **Demonstrate** respect for professional ethical standards. 9.3 **Demonstrate** concern for the impacts of the food industry on the sustainable development of mankind.
PLO 10 (Life-long learning)	**Be** ready for lifelong learning to advance one's career in a rapidly changing technology landscape.	10.1. **Identify** properly personal limitations with respect to the knowledge, required competencies of the food technology engineer and modern trends in the profession. 10.2. **Identify** learning opportunities to enhance knowledge and competence. 10.3 **Be** willing to engage in lifelong learning for innovation and creativity.

20. Graduation requirements

Students accumulate enough courses and 151 credits of the program. In which, the cumulative GPA is 2.0/4.0 or higher; foreign language certificates, certificates of defense education, physical education and soft skills.

21. Transfer to and from other programs, opportunities for further education, opportunities to acquire additional professional licenses and certificates

- Policy to change majors: The university supports students who wish to change to another major. The policy of transferring majors and transferring grades is clearly stated in the student handbook.
- Opportunities for further study: Graduates of Food Technology are eligible to participate in higher education programs in domestic and foreign universities (Master of Food Technology, Master of Science in Food Science).
- Opportunity to get professional certificates and practice certificates: during their studies, students can participate in training and certification courses (Laboratory safety, Food hygiene and safety). , foreign languages, informatics, etc.).

Section C. Teaching/learning methods and strategies

22. 1. Educational philosophy

EDUCATION PHILOSOPHY NGUYEN TAT THANH UNIVERSITY " Real Learning - Real Practice - Real Prestige - Real Career"		
EDUCATIONAL PHILOSOPHY OF THE EFT PROGRAM "Learning by doing" *Learners experience with problem solving and reflection to build their own knowledge*		
LEARNING ORIENTATIONS		
Professional competences	**Personal competences**	**Ethics and responsibility**
Implement modern Food Technology techniques that meet national and international quality standards	Collaborate with stakeholders, lead teams, conduct lifelong learning, innovate and create, and be ready for international integration	Maintain professional ethics, comply with the law, and fulfill responsibilities for the health protection and economic development of the community
PROGRAM LEARNING OUTCOMES		
PLOs 1, 2, 3, 7, and 8	PLOs 4, 5, 6, and 10	PLO 9

23. Teaching and learning paradigm)

Lecture

Discussion

Presentation (by students)

Course project

Skill practice (application exercises or practical courses)

Field trip, internship

Graduation thesis

Learning through scientific research

Start-up activities

24. Student assessment

Entry assessment (University admission)

In-course assessment

The PLOs are translated into CLOs and CLOs are the starting points for designing course assessment methods. In compliance with the university's regulations, the lecturers present the assessment plan (continuous assessment, periodical assessment), assessment schedule, and the assessment matrix (how many times and by what methods each CLO was evaluated) in all the course specifications of the program.

Exit assessment

Exit assessment also known as the graduation assessment of the program is conducted via the graduation thesis. The time to register for the graduation course is before the 11th semester takes place. The graduation thesis requires students to apply appropriate scientific research methods (PLO 7) to research a problem of the food industry and write a thesis, and defend it before the Graduation Thesis Defense Council. The content of the thesis must present an overview of materials related to research, scientific research methods, experiment implementation, data analysis, and proposed solutions (PLOs 2, 3, 4, 7, and 8). Through the implementation of the thesis, the advisor also assesses students to determine the required competencies of a food technology engineer, the ability to self-study, self-research, and research ethics (PLO 10).

25. Program structure and content

ENGINEERING IN FOOD TECHNOLOGY (151 CR)

GENERAL COURSES (21 CR)

POLITICS (11 CR)
1. The basic principles of Marxism – Leninism (3CR)
2. Political economics of Marxism and Leninism (2 CR)
3. Scientific socialism (2 CR)
4. History of the Communist Party of Vietnam(2 CR)
5. Ho Chi Minh Ideology (2CR)

LAW (2 CR)
1. Introduction to Law (2CR)

QUANTITATIVE STUDIES (6 CR)
1. Calculus A1 (2CR)
2. Calculus A2 (2CR)
3. Probability and Statistics (2CR)

PHYSICAL SCIENCES (2 CR)
1. General Physics A1 (2CR)

SUPPORTIVE COURSES (29 CR)

INFORMATION (2 CR)
1. Microsoft Office Specialist 1 (MOS 1) (2CR)

FOREIGN LANGUAGES (18 CR)
1. General English 1 (3CR)
2. General English 2 (3CR)
3. English for Communication 1 (3CR)
4. English for Communication 2 (3CR)
5. Professional English 1 (3CR)
6. Professional English 2 (3CR)

METHODOLOGY – SKILLS (8 CR)
1. Communication skills 1 (2CR)
2. Communication skills 2 (2CR)
3. Start-up (2CR)
4. Research methodology (2CR)

CORE COURSES (53 CR)

1. Introduction to food technology (2CR)
2. General chemistry (3CR)
3. General chemistry Laboratory (1CR)
4. Introduction to molecular biology (2CR)
5. Food chemistry (4CR)
6. Food biochemistry (4CR)
7. Food microbiology (5CR)
8. Food sanitation, safety and regulation (3CR)
9. Nutrition (3CR)
10. Food additives (2CR)
11. Food analysis 1 (4CR)
12. Food analysis 2 (3CR)
13. Food sensory evaluation (3CR)
14. Food engineering 1 (4CR)
15. Food engineering 2 (4CR)
16. Design and Analysis of Experimental Data (2CR)
17. Food science (2CR)
18. Heating and Refrigeration Technology (2CR)

FOOD PLANT PRACTICE (7 CR)

1. Internship (7CR)

GRADUATION CONDITION (0 CR)

1. Physical Education
2. National Defense Education

GENERAL AND SUPPORTIVE ELECTIVES (2 CR)

1. Creative thinking (2CR)
2. Calculation method (2CR)
3. Linear Programming (2CR)

SPECIALIZATION 1: NUTRITION AND FOOD PROCESSING (30 CR)

1. Fundamentals of food processing (4CR)
2. Food Packaging and Preservation (4CR)
3. Food quality management (4CR)
4. Project on food product development (2CR)
5. Project on food plant design and operations (1CR)
6. Nutritional values of food (2CR)

Major electives (13CR)

Group A (9CR)
1. Milk and Dairy Product Processing Technology (3CR)
2. Meat and Seafood Processing Technology (3CR)
3. Beverage processing technology (3CR)
4. Sugar and Confectionery Processing Technology (3CR)
5. Fruit and Vegetable Processing Technology (3CR)
6. Cereals and Grains Processing Technology (3CR)
7. Tea, Coffee and Cocoa Processing Technology (3CR)

Group B (4CR)
1. Functional food (2CR)
2. Risk assessment of food (2CR)
3. Food supply chain and traceability (2CR)
4. Food business (2CR)

SPECIALIZATION 2: FOOD QUALITY, SAFETY AND TRACEBILITY (30 CR)

1. Food Packaging and Preservation (4CR)
2. Food quality management (4CR)
3. Agri-food analysis and assessment (4CR)
4. Food laws and regulations (2CR)
5. Food supply chain and traceability (2CR)
6. Project on food quality assurance (1CR)

Major electives (13CR)

Group A (7CR)
1. Food toxicology and allergies (3CR)
2. Functional food (2CR)
3. Nutritional values of food (2CR)
4. Risk assessment of food (2CR)
5. Food business (2CR)

Group B (6CR)
1. Crops processing technology (3CR)
2. Meat and Seafood Processing Technology (3CR)
3. Beverage processing technology (3CR)
4. Milk and Dairy Product Processing Technology (3CR)

GRADUATION REQUIREMENT (10 CR)

1. Graduation thesis (10 CR)

26. Development of program learning outcomes in the constituent courses

#	Course title	Std road-map	General knowledge				Professional knowledge										General skills												Professional skills						Attitude					
			PLO1				PLO2				PLO3						PLO4					PLO5						PLO6			PLO7			PLO8			PLO9			PLO10		
			1.1	1.2	1.3	1.4	2.1	2.2	2.3	2.4	3.1	3.2	3.3	3.4	3.5	3.6	4.1	4.2	4.3	4.4	4.5	5.1	5.2	5.3	5.4	5.5	5.6	6.1	6.2	6.3	7.1	7.2	7.3	8.1	8.2	8.3	9.1	9.2	9.3	10.1	10.2	10.3
1	General Physics A1	Year 1		I													I	I				I	I															I		I	
2	Calculus A1	Year 1	I														I																				I				
3	Introduction to food technology	Year 1					I	I		I		I	I	I			I											I	I	I								I				
4	General chemistry	Year 1		I			I				I																					I						I				
5	General chemistry Laboratory	Year 1		I			I																							I	I		I	I	I			I				
6	Introduction to molecular biology	Year 1		I			I										I													I	I										I
7	The basic principles of Marxism – Leninism	Year 1				I												I		I		I	I													I			I		
8	Political economics of Marxism and Leninism	Year 1				I												I		I		I	I													I			I		
9	Communication skills 1	Year 1				I													I			I	I	I		I											I		I		
10	General English 1	Year 1				I													I			I	I	I		I											I	I		I	
12	Calculus A2	Year 1	I														I																				I				
13	Microsoft Office Specialist 1	Year 1			I																			I	I														I		
14	Food chemistry	Year 1									I					I			I														I	I					I		
15	Communication skills 2	Year 1				I												I	I			I	I	I		I											I		I		
16	General English 2	Year 1				I												I									I										I		I		
17	Scientific socialism	Year 1				I												I				I	I	I													I			I		
19	Food biochemistry	Year 1		I							I				I				I		I												I						I		

20	Food microbiology	Year 1		I				I			I		I								I													I			I					
21	History of the Communist Party of Vietnam	Year 2				P												P				P	P	P													P			P		
22	Introduction to Law	Year 2				P												P	P			P	P			P											P			P		
23	Probability and Statistics	Year 2	P														P							P						P									P			
24	English for Communication 1	Year 2				P													P								P											P				P
25	Start-up	Year 2			P									I				P	P	P		P	P		P	P													P			P
26	Food additives	Year 2									P				P	P			P			P															P					
27	Nutrition	Year 2									P					P			P			P																P				
28	Ho Chi Minh Ideology	Year 2				P												P	P			P	P	P													P			P		
29	Creative thinking	Year 2				P														P	P					P													P		P	
30	Calculation method	Year 2	P																	P	P																		P			
31	Linear Programming	Year 2	P																	P	P																		P			
32	Food sanitation, safety and regulation	Year 2					P	P			P								P																			P				
33	Food analysis 1	Year 2	P							I	P																	P						P		I	P					
34	Professional English 1	Year 2					P																						P	P			P								P	
35	English for Communication 2	Year 2				P													P								P											P				P
36	Food science	Year 2		P	P			P			P			P			P																									P
37	Food engineering 1	Year 2		P					P				P				P																		P							P
38	Food analysis 2	Year 2	P					P		I	P	P	P																		P			P		I	P					
39	Design and Analysis of Experimental Data	Year 2														P	P											P			P	P										P
40	Heating and Refrigeration Technology	Year 3		P				P					P	P			P																		P							P

41	Food sensory evaluation	Year 3								P	P					P													P		P					P		P				
42	Food engineering 2	Year 3		M				P					P	P			P																		P							P
43	Professional English 2	Year 3					P																							P			P									M
44	Research methodology	Year 3														P	P	P					M	M	M		P				M	M										M
SPECIALIZATION 1. NUTRITION AND FOOD PROCESSING																																										
45	Fundamentals of food processing	Year 3					P	P			M	M			M																		P	P				P			
46	Food quality management	Year 3					M	M	P							M			P																M	M					
47	Nutritional values of food	Year 3								P				M			P				M												M								M	
48	Project on food plant design and operations	Year 3		M	M				M		M	M																					M	M			P					
49	Milk and Dairy Product Processing Technology	Year 3					M	M			M	M																P						P	P							M
50	Meat and Seafood Processing Technology	Year 3					M	M			M	M																P						P	P							M
51	Beverage processing technology	Year 3					M	M			M	M																P						P	P							M
52	Functional food	Year 3						P				P	P		P						M																			P		
53	Food business	Year 3				M								M				M	P		M	M		M		M	M		M								P	P				
54	Food Packaging and Preservation	Year 3				M				P						M				M	M									P	M									M		
55	Project on food product development	Year 3			M				M		M	M		M	M																	M			M		P					
56	Sugar and Confectionery Processing Technology	Year 3					M	M			M	M																P						P	P							M

57	Fruit and Vegetable Processing Technology	Year 3					M	M			M	M																P						P	P							M
58	Cereals and Grains Processing Technology	Year 3					M	M			M	M																P						P	P							M
59	Tea, Coffee and Cocoa Processing Technology	Year 3					M	M			M	M																P						P	P							M
60	Risk assessment of food	Year 3				M		M					M	M		M		M	M															M					M			
61	Food supply chain and traceability	Year 3			M		M			M																		M								M	M					
62	Internship	Year 4						M					M				M									M									M					M		
63	Graduation thesis	Year 4								M					M				M													M		M					M		
SPECIALIZATION 2. FOOD QUALITY, SAFETY AND TRACEBILITY																																										
45	Food Packaging and Preservation	Year 3				M				P						M														P	M							M			
46	Food quality management	Year 3					M	M	P							M			P																M	M					
47	Food laws and regulations	Year 3				M	P	P		P	P						P		P																	M					
48	Food toxicology and allergies	Year 3				M					P	P					P		P									P									P				
49	Functional food	Year 3						P				P	P		P						M																P				
50	Crops processing technology	Year 3					M	M			M	M																P						P	P							M
51	Meat and Seafood Processing Technology	Year 3					M	M			M	M																P						P	P							M
52	Project on food quality assurance	Year 3		M	M			M	M							M				M															M	M					
53	Agri-food analysis and assessment	Year 3									M	M	M					M	M											M				M					M	M	
54	Food supply chain and traceability	Year 3			M		M			M																		M								M	M					

55	Nutritional values of food	Year 3								P				M			P				M												M								M	
56	Risk assessment of food	Year 3				M		M					M	M		M		M	M															M					M			
57	Food business	Year 3				M								M				M	P		M	M		M		M	M		M								P	P				
58	Milk and Dairy Product Processing Technology	Year 3					M	M			M	M																P						P	P							M
59	Beverage processing technology	Year 3					M	M			M	M																P						P	P							M
60	Internship	Year 4						M					M				M									M									M					M		
61	Graduation thesis	Year 4								M					M				M													M		M						M		

27. Sample study plan

For students who choose Specialization 1: Nutrition and Food Processing

#	Course code	Course title	Credits
SEMESTER 1			12
1	001868	General Physics A1	*2 (2, 0, 4)*
2	001786	Calculus A1	*2 (2, 0, 4)*
3	073468	Introduction to food technology	*2 (1, 1, 0)*
4	074929	General chemistry	*3 (3, 0, 6)*
5	073637	General chemistry Laboratory	*1 (0, 1, 0)*
6	001433	Introduction to molecular biology	*2 (2, 0, 4)*
SEMESTER 2			18
1	075580	The basic principles of Marxism – Leninism	*3 (3, 0, 6)*

2	075581	Political economics of Marxism and Leninism	*2 (2, 0, 4)*
3	001787	Calculus A2	*2 (2, 0, 4)*
4	073499	General English 1	*3 (2, 1, 4)*
5	073620	Food chemistry	*4 (3, 1, 6)*
6	073493	Microsoft Office Specialist 1 (MOS 1)	*2 (0, 2, 0)*
7	070006	Communication skills 1	*2 (2, 0, 4)*
8	070022	National Defense Education	*non-credit*
SEMESTER 3			16
1	075582	Scientific socialism	*2 (2, 0, 4)*
2	070007	Communication skills 2	*2 (2, 0, 4)*
3	073500	General English 2	*3 (2, 1, 4)*
4	075132	Food biochemistry	*4 (3, 1, 6)*
5	073601	Food microbiology	*5 (4, 1, 8)*
6	070023	Physical Education	*non-credit*
SEMESTER 4			16
1	075583	History of the Communist Party of Vietnam	*2 (2, 0, 4)*
2	073513	Start-up	*2 (2, 0, 4)*
3	073501	English for Communication 1	*3 (2, 1, 4)*
4	070011	Introduction to Law	*2 (2, 0, 4)*
5	001030	Probability and Statistics	*2 (2, 0, 4)*
6	001304	Food additives	*2 (2, 0, 4)*
7	071684	Nutrition	*3 (3, 0, 6)*
SEMESTER 5			14

1	075584	Ho Chi Minh Ideology	*2 (2, 0, 4)*
2	071690	Professional English 1	*3 (2, 1, 4)*
3	072735	Food sanitation, safety and regulation	*3 (3, 0, 6)*
4	075133	Food analysis 1	*4 (3, 1, 6)*
General and supporting electives (Choose 2 cr)			2
1	070796	Creative thinking	*2 (2, 0, 4)*
2	070182	Calculation method	*2 (2, 0, 4)*
3	071340	Linear Programming	*2 (2, 0, 4)*
SEMESTER 6			14
1	073502	English for Communication 2	*3 (2, 1, 4)*
2	073843	Food engineering 1	*4 (3, 1, 6)*
3	075134	Food analysis 2	*3 (2, 1, 4)*
4	071698	Design and Analysis of Experimental Data	*2 (2, 0, 4)*
5	076131	Food science	*2 (2, 0, 4)*
SEMESTER 7			14
1	075914	Professional English 2	*3 (2, 1, 4)*
2	073844	Food engineering 2	*4 (3, 1, 6)*
3	074606	Research methodology	*2 (2, 0, 4)*
4	073605	Food sensory evaluation	*3 (2, 1, 4)*
5	075917	Heating and Refrigeration Technology	*2 (2, 0, 4)*
SEMESTER 8			16
1	076139	Project on food plant design and operations	*1 (0, 1, 0)*
2	071111	Food quality management	*4 (3, 1, 6)*

3	075918	Fundamentals of food processing	*4 (3, 1, 6)*
4	076140	Nutritional values of food	*2 (2, 0, 4)*
Specialization electives: Group A (Choose 3 cr)			3
1	073607	Milk and Dairy Product Processing Technology	*3 (2, 1, 4)*
2	075140	Meat and Seafood Processing Technology	*3 (2, 1, 4)*
3	071246	Beverage processing technology	*3 (2, 1, 4)*
Specialization electives: Group B (Choose 2 cr)			2
1	071689	Functional food	*2 (2, 0, 4)*
2	076134	Food business	*2 (2, 0, 4)*
SEMESTER 9			14
1	075919	Food Packaging and Preservation	*4 (3, 1, 6)*
2	075139	Project on food product development	*2 (0, 2, 0)*
Specialization electives: Group A (Choose 6 cr)			6
1	075142	Sugar and Confectionery Processing Technology	*3 (2, 1, 4)*
2	071044	Fruit and Vegetable Processing Technology	*3 (2, 1, 4)*
3	071242	Cereals and Grains Processing Technology	*3 (2, 1, 4)*
4	073615	Tea, Coffee and Cocoa Processing Technology	*3 (2, 1, 4)*
Specialization electives: Group B (Choose 2 cr)			2
1	076132	Risk assessment of food	*2 (2, 0, 4)*
2	076133	Food supply chain and traceability	*2 (2, 0, 4)*
SEMESTER 10			7
1	075929	Internship	*7 (0, 7, 0)*
SEMESTER 11 + 12			10

1	000746	Graduation thesis	*10 (0, 10, 0)*

For students who choose Specialization 2: Food Quality, Safety and Tracebility

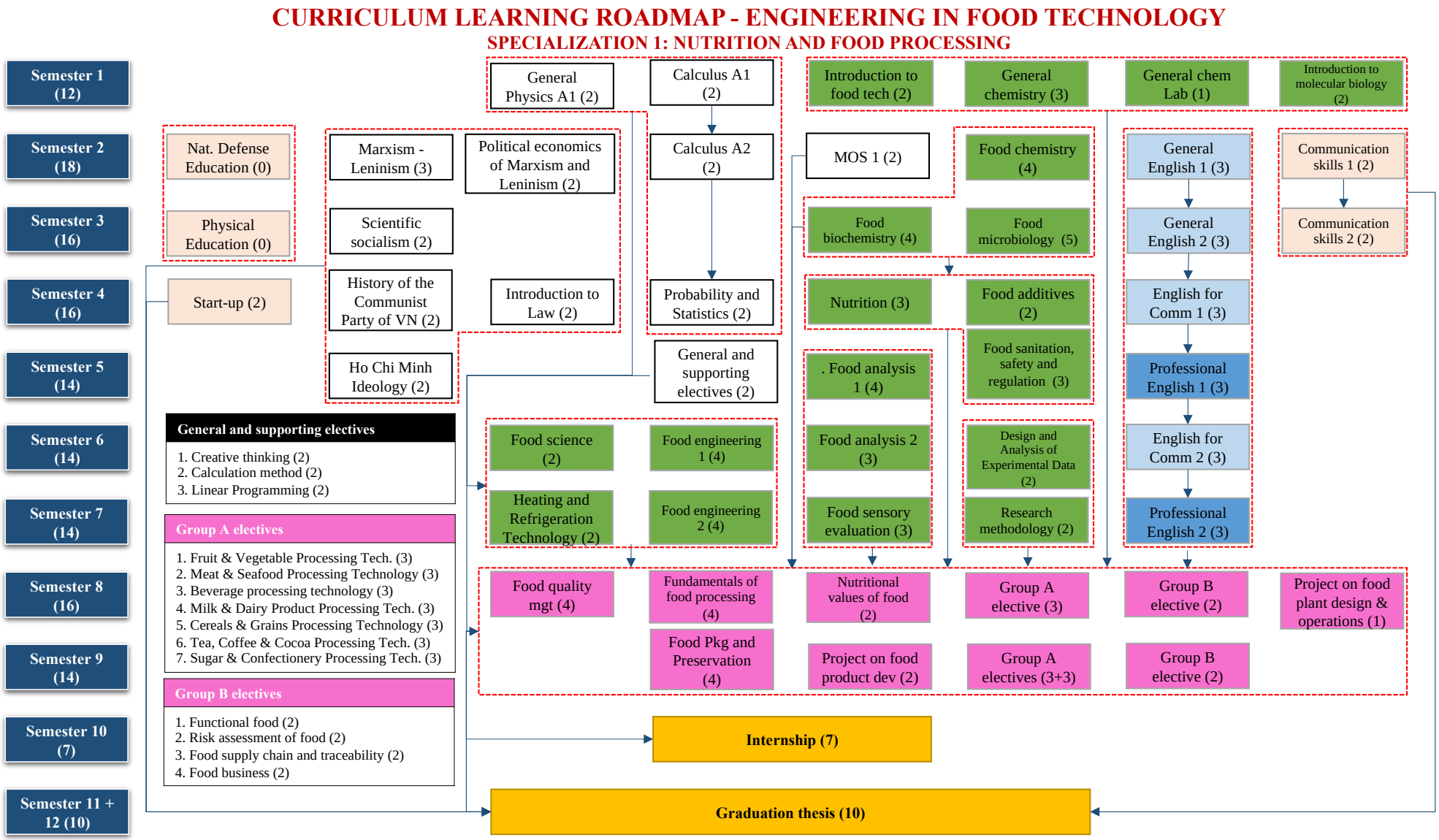
#	Course code	Course title	Credits
SEMESTER 1			12
1	001868	General Physics A1	*2 (2, 0, 4)*
2	001786	Calculus A1	*2 (2, 0, 4)*
3	073468	Introduction to food technology	*2 (1, 1, 0)*
4	074929	General chemistry	*3 (3, 0, 6)*
5	073637	General chemistry Laboratory	*1 (0, 1, 0)*
6	001433	Introduction to molecular biology	*2 (2, 0, 4)*
SEMESTER 2			18
1	075580	The basic principles of Marxism – Leninism	*3 (3, 0, 6)*
2	075581	Political economics of Marxism and Leninism	*2 (2, 0, 4)*
3	001787	Calculus A2	*2 (2, 0, 4)*
4	073499	General English 1	*3 (2, 1, 4)*
5	073620	Food chemistry	*4 (3, 1, 6)*
6	073493	Microsoft Office Specialist 1 (MOS 1)	*2 (0, 2, 0)*
7	070006	Communication skills 1	*2 (2, 0, 4)*
8	070022	National Defense Education	*non-credit*
SEMESTER 3			16
1	075582	Scientific socialism	*2 (2, 0, 4)*
2	070007	Communication skills 2	*2 (2, 0, 4)*

3	073500	General English 2	*3 (2, 1, 4)*
4	075132	Food biochemistry	*4 (3, 1, 6)*
5	073601	Food microbiology	*5 (4, 1, 8)*
6	070023	Physical Education	*non-credit*
SEMESTER 4			16
1	075583	History of the Communist Party of Vietnam	*2 (2, 0, 4)*
2	073513	Start-up	*2 (2, 0, 4)*
3	073501	English for Communication 1	*3 (2, 1, 4)*
4	070011	Introduction to Law	*2 (2, 0, 4)*
5	001030	Probability and Statistics	*2 (2, 0, 4)*
6	001304	Food additives	*2 (2, 0, 4)*
7	071684	Nutrition	*3 (3, 0, 6)*
SEMESTER 5			14
1	075584	Ho Chi Minh Ideology	*2 (2, 0, 4)*
2	071690	Professional English 1	*3 (2, 1, 4)*
3	072735	Food sanitation, safety and regulation	*3 (3, 0, 6)*
4	075133	Food analysis 1	*4 (3, 1, 6)*
General and supporting electives (Choose 2 cr)			2
1	070796	Creative thinking	*2 (2, 0, 4)*
2	070182	Calculation method	*2 (2, 0, 4)*
3	071340	Linear Programming	*2 (2, 0, 4)*
SEMESTER 6			14
1	073502	English for Communication 2	*3 (2, 1, 4)*

2	073843	Food engineering 1	*4 (3, 1, 6)*
3	075134	Food analysis 2	*3 (2, 1, 4)*
4	071698	Design and Analysis of Experimental Data	*2 (2, 0, 4)*
5	076131	Food science	*2 (2, 0, 4)*
SEMESTER 7			14
1	075914	Professional English 2	*3 (2, 1, 4)*
2	073844	Food engineering 2	*4 (3, 1, 6)*
3	074606	Research methodology	*2 (2, 0, 4)*
4	073605	Food sensory evaluation	*3 (2, 1, 4)*
5	075917	Heating and Refrigeration Technology	*2 (2, 0, 4)*
SEMESTER 8			16
1	071111	Food quality management	*4 (3, 1, 6)*
2	075919	Food Packaging and Preservation	*4 (3, 1, 6)*
3	076136	Food laws and regulations	*2 (2, 0, 4)*
Specialization electives: Group A (Choose 3 cr)			3
1	076138	Food toxicology and allergies	*3 (2, 1, 4)*
2	071689	Functional food	*2 (2, 0, 4)*
Specialization electives: Group B (Choose 3 cr)			3
1	076141	Crops processing technology	*3 (2, 1, 4)*
2	075140	Meat and Seafood Processing Technology	*3 (2, 1, 4)*
SEMESTER 9			14
1	076133	Food supply chain and traceability	*2 (2, 0, 4)*
2	076137	Project on food quality assurance	*1 (0, 2, 0)*

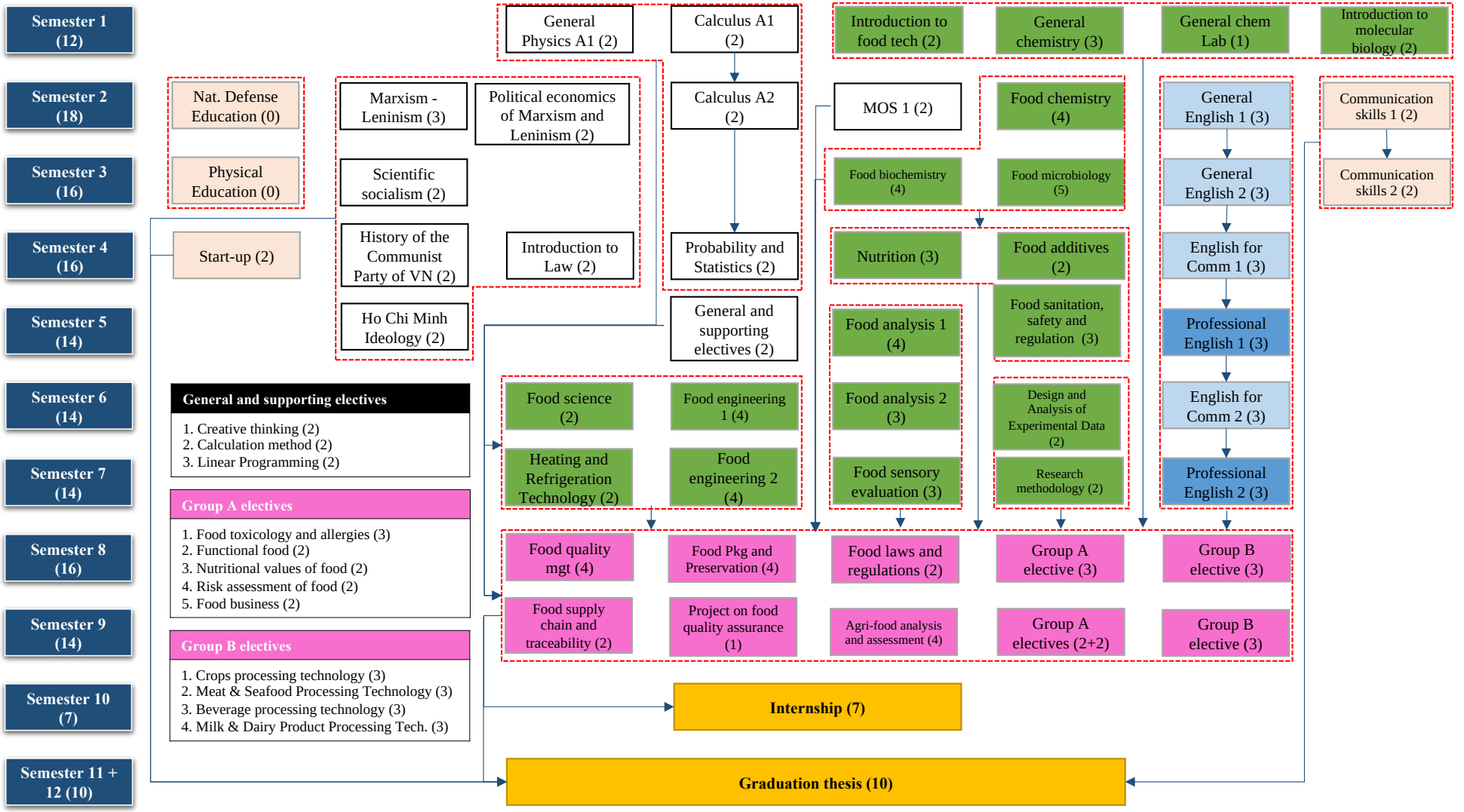
3	076145	Agri-food analysis and assessment	*4 (2, 2, 8)*
Specialization electives: Group A (Choose 4 cr)			4
1	076140	Nutritional values of food	*2 (2, 0, 4)*
2	076132	Risk assessment of food	*2 (2, 0, 4)*
3	076134	Food business	*2 (2, 0, 4)*
Specialization electives: Group B (Choose 3 cr)			3
1	073607	Milk and Dairy Product Processing Technology	*3 (2, 1, 4)*
2	071246	Beverage processing technology	*3 (2, 1, 4)*
SEMESTER 10			7
1	075929	Internship	*7 (0, 7, 0)*
SEMESTER 11 + 12			10
1	000746	Graduation thesis	*10 (0, 10, 0)*

28. Curriculum learning roadmap



CURRICULUM LEARNING ROADMAP - ENGINEERING IN FOOD TECHNOLOGY

SPECIALIZATION 2: FOOD QUALITY, SAFETY AND TRACEBILITY



29. Mechanism to establish and monitor achievement of program outcomes

Before 2020, the faculty requires students to self-assess their PLOs achievement at the time of graduation by survey according to 3 levels: Not achieved, Partly achieved, Fully achieved. From the 2020-2021 cohort, the program monitors and evaluates the achievement of PLOs of graduates using the following methods: student survey at the time of graduation and a mechanism to monitor and evaluate students; progress in achieving PLOs based on on the course results at the end of each academic year.

Section D. Learning environment and student support services

30. Learning environment

University campuses

#	Content	Area (m^2)
I	**Total land area the university manage and use**	**289,458**
1	300A Nguyen Tat Thanh, Ward 13, District 4	2.208
2	298A Nguyen Tat Thanh, Ward 13, District 4	6,001
3	38 Ton That Thuyet, Ward 16, District 4	1.617
4	27A Nguyen Oanh, Ward 17, Go Vap District	850
5	331 National Highway 1A, An Phu Dong Ward, District 12	5.705
6	Membrane House Institute of Biotechnology2374 Trung My Tay, District 12	3.230
7	458/3F Nguyen Huu Tho, Tan Hung Ward, District 7	12,243
8	38 Nguyen Van Quy, Phu Thuan Ward, District 7	1,400
9	109 Vo Thi Thua, Quarter 3, An Phu Dong Ward, District 12	1.462
10	Military Hospital 175 786 Nguyen Kiem, Ward 3, Go Vap District	1,040
11	Center for CNC Development Nguyen Tat Thanh University: Lot E3-I1.1, E3-I1.2, E3-I.3 D1 Street, Hi-Tech Park, Long Thanh My Ward, District 9	47,014
12	High-tech training center Nguyen Tat Thanh University: E1A Training Area Hi-Tech Park, Tan Phu Ward, District 9	14.759
13	Millennium Park Project High-Tech Park District 9	191,929
II	**Total constructed floor area for training and scientific research**	**79,601**

1	300A Nguyen Tat Thanh, Ward 13, District 4	8,634
2	298A Nguyen Tat Thanh, Ward 13, District 4	7,928
3	38 Ton That Thuyet, Ward 16, District 4	3.015
4	27A Nguyen Oanh, Ward 17, Go Vap District	1.296
5	331 National Highway 1A, An Phu Dong Ward, District 12	31,082
6	Membrane House Institute of Biotechnology2374 Trung My Tay, District 12	3,100
7	458/3F Nguyen Huu Tho, Tan Hung Ward, District 7	5.237
8	38 Nguyen Van Quy, Phu Thuan Ward, District 7	1,400
9	109 Vo Thi Thua, Quarter 3, An Phu Dong Ward, District 12	1,040
10	Nguyen Tat Thanh University CNC Development Center (block N1) Lot E3-I1.1, E3-I1.2, E3-I.3 D1 Street, Hi-Tech Park, Long Thanh My Ward, District 9	1.659
11	Military Hospital 175 786 Nguyen Kiem, Ward 3, Go Vap District	15,210

List of physical space categories and their areas

No.	**Types**	**Quantity**	**Area (m^2)**
I.	**Classrooms**	**449**	**38.553**
1	Number of multimedia classrooms	19	1.007
2	Number of offices of professors, associate professors, permanent lecturers	72	2.376
3	Large halls and classrooms with over 200 seats	20	5.695
4	Classrooms from 100 to 200 seats	184	21,160
5	Classrooms from 50 seats to 100 seats	124	7,025
6	Classrooms with less than 50 seats	30	1.290
II.	**Function rooms**	**248**	**22,383**
8	Libraries/Learning Resource Centers	3	4.814
9	Laboratories	88	8.225
10	Workshops, practice rooms	55	5.583
11	Multi-purpose gyms	2	345
12	Offices	100	3.416
III.	**Other area:**	**63**	**4.628**

13	Dormitory	62	3,378
14	Stadium	1	1,250

List of libraries/learning resource centers

Room name	**Quantity**	**Area (m^2)**
Library	3	5,000
- Reading room	4	2,543
- Research room	2	300
- Conference Room	2	182
- Gym	1	134
- Self-study area	2	677
- Group study room	10	223
- Bookstore	1	75
- Multimedia room	1	45
- Scientific research reference room	1	58
- Library back office and electronic resources	2	56
- Storage	1	172

List of laboratory facilities that the program utilizes

#	**Name of the laboratory**	**Quantity**	**Function**	**Use for course**
1	General Chemistry Lab 1	01	Courses and scientific research	General chemistry General Chemistry Lab Food chemistry Food Biochemistry Food Analysis 1 Food Analysis 2 Food quality management Agri-food analysis and assessment Project on food quality assurance Graduation Thesis Scientific research
2	General Chemistry Lab 2	01	Courses and scientific research	

3	Microbiology Lab	01	Courses and scientific research	Food microbiology Food quality management Project on food product development Project on Food Quality Assurance Graduation Thesis Scientific research
4	Process & Equipment Lab	01	Courses and scientific research	Food Engineering 1 Food Engineering 2
5	Sensory Analysis Lab	01	Courses and scientific research	Food sensory evaluation Project on food product development Graduation Thesis Scientific research
6	Experimental Production Lab	01	Courses and scientific research	Project on food product development Graduation thesis Scientific research
7	Food Research and Development Lab	01	Courses and scientific research	Food processing technology Food packaging and preservation Food quality management Project on food product development Specialized groups in processing technology Graduation thesis Scientific research
8	Food Processing Lab	01	Courses and scientific research	Food processing technology Food packaging and preservation Food quality management Project on food product development Specialized courses in processing technology Graduation thesis Scientific research

9	Environmental Lab	01	Courses and scientific research	Graduation thesis Scientific research

List of computer labs

#	**Name of computer lab**	**Quantity**	**Area (m^2)**
Common computer labs			
1	Van Khanh computer lab, Faculty of Automotive, Mechanical, Electrical and Electronic Engineering	30 computers	50
2	Computer lab L.407B, Faculty of Engineering and Technology	36 computers	50
3	Computer lab, Faculty of Pharmacy	61 machines	50
4	Computer lab, Faculty of Architecture - Construction - Applied Arts	30 computers	40
5	Practical machine room, Faculty of Foreign Languages	50 computers	50

List of educational and industry standard software that students are exposed to in the program

Software name	**Use for courses**
Microsoft Windows	MOS Courses requiring essays, group presentations, projects
Microsoft Word	
Microsoft Power Point	
Microsoft Excel	
IBM SPSS 22.0	Probability and Statistics Graduation Thesis
E-Learning (LMS, LCMS)	Online Teaching and Learning Management at NTTU

List of electronic databases

#	**Electronic databases**
1	ProQuest
2	Springer Link
3	IEEE Xplore
4	Science Direct
5	Scopus

6	SAGE e-Journals Collection
7	Emerald e-Journals Collection
8	Springer Nature
9	IG Publishing eBooks Collection
10	Directory of Open Access Book
11	Directory of Open Access Journal
12	Open Textbook Library
13	BCCampus Open Textbook
14	Credo Reference
15	Springer eBooks Collection
16	Elsevier eBooks Collection
17	FiinPro's Economic, Financial, and Macroeconomic Database (Including data of 3200 enterprises, including 1,700 listed enterprises, 1500 unlisted public enterprises)

- Some notable enterprises that collaborates with the program:

+ Saigon Food Joint Stock Company

+ Zennatural Herbal Joint Stock Company

+ Center for Biotechnology in Ho Chi Minh City

+ Warrantek Joint Stock Company

31. Support for students and their learning

#	Field	Student support services	
		University level	**Faculty level**
1	**Academic**	**Training Management Department:** + Support the registration of courses, provide timetables. + Record, manage, store, secure student learning results, and provide transcripts to students.	**Faculty secretary:** + Support students to register for courses, register for replacement courses, re-take, ... + Store student learning results. **Academic advisors:**

		+ Notify students when the GPA approaches 2.0.	+ Counsel students on learning, career orientation, problems and difficulties in life. + Monitor student's learning situation and notify students early about learning problems. + Guide students to functional units in the university related to student issues that need support.
		Science and Technology Department: + Support registration procedures for scientific research projects. + Introduce students to opportunities and funding sources for scientific research. + Instruct on how to publish national and international scientific articles.	+ Lecturers guide students in scientific research. + The faculty organizes seminars to support students in scientific research such as: how to find information, choose topics, collect, process data and write reports.
		Student Affairs Department: + Issue and disseminate the Student Handbook.	+ Faculty secretary and academic advisors guide students about the rules, regulations and procedures of the university.
		E-learning Institute: + Guide students on techniques to participate in online learning. + Support students when having difficulty in online learning.	+ Faculty secretary supports opening online classes and informing students. + Instructors guide students in online learning methods.
2	**Financial and scholarship**	**Student Affairs Department:** + Implement social welfare policies and scholarships for poor students, students from	**Lecturers:** + Support students to find jobs and scholarships.

		ethnic minorities, students with disabilities, students with difficult circumstances, students who are entitled to social policies. + Implement the policy of scholarships to encourage learning for students with good academic achievements. + Support students to apply for loans at the social policy bank.	+ Search for scholarship sponsors for students with good academic results.
3	**Career, employment and start-up**	**Business and Employment Relations Department:** + Support students to find jobs through connecting business networks. + Organize recruitment day. + Search for scholarships for students through sponsors. + Create a creative space, support startup projects, open startup training courses for students, organize startup competitions for students.	**Lecturers and personnel in charge of business relations:** + Connect and develop business network. + Introduce jobs and scholarships for students. + Develop a network of business lecturers.
4	**Housing**	**Student Affairs Department :** + Counsel, recommend accommodation for students, inform the procedures when students stay at the university's dormitories.	+ Introduce student accommodation.
5	**Mentoring and counseling**	**Student Affairs Department:**	+ Lecturers advise on learning, answer questions during course registration,

		+ Organize the orientation week at the beginning of the year and at the beginning of the cohort. + Advice on health insurance policies for students.	solve problems that occur during study and exam. + Faculty support on course organization, exam and re-take,... Academic advisors provide support on university policies. + Faculty secretary helps support issues related to life activities, explains youth volunteer activities, Green summer. The lecturers in charge of the mentoring club on learning, research and interact with businesses, organize workshops on career-related skills and future career trends.
6	**Recreation and sports**	**Union office:** + Organize competitions on history, art, sports, for students. + Organize community service activities such as spring of love, green summer, etc.	+ Faculty organizes extracurricular activities at faculty level. + Organize networking events between lecturers, students, businesses and alumni.
7	**Medical care and wellness**	**Medical room:** + Organize the implementation of management and health care for staff and students. + Propagate, educate and advise on health-related issues such as self-care measures, prevention and treatment of common diseases. + Coordinate with Student Affairs Department to propagate about benefits when participating in health insurance	

		and guide participation procedures. + Organize university health activities such as epidemic prevention, university hygiene, food hygiene and safety, health checkup for students.	
8	**Library services**	**Library:** + Manage and supplement resources for the study and research of lecturers and students. + Digital library makes it easy for students to find documents. + Support students in finding documents and lending them materials to use at home.	
9	**International student support**	**International Student Support Center:** + Support visa procedures, entry and exit, temporary residence extension. + Coordinate with the training department to support learning-related issues for international students. + Support for living expenses for international students. + Support to solve problems arising in the learning process at university. + Regularly organize cultural exchanges between international	**Faculty secretary:** + Create conditions for international students to complete training programs, activities and community exchanges. **Academic advisors:** + Conduct academic advising. + Find out students' thoughts, aspirations and problems for timely support.

		students and Vietnamese students. + Organize traditional cultural events for international students.	
10	**Internal Quality Assurance**	**Testing Center:** + Support to view scores online. + Provide training to improve student training activities.	+ Lecturers carry out professional activities to improve teaching and learning methods. + The faculty secretary archive evidence and makes plans for activities and faculty meetings under the direction of the dean.
11	**Other services**	- Organic agricultural products - Souvenir shop - Bookstore	

Section E. Approval, publication and update

32. Approval date for this program specification

26/6/2020

33. Last update date of this program specification

26/6/2020

Appendix I. Brief outline of all courses in the program

The basic principles of Marxism – Leninism: 03 credits

Content: The course deals with the system of views and scientific doctrines of Marx, Engels and Lenin on philosophy, one of the three components of Marxism-Leninism. The course content is structured into three parts, corresponding to six lessons: A brief introduction on philosophy, Marxist-Leninist philosophy, and the role of Marxist-Leninist philosophy in social life; Part Two: Dialectical Materialism; Part Three: Historical Materialism.

Political economics of Marxism and Leninism: 02 credits

Content: The course consists of 6 chapters. Chapter 1 presents the research course, research method, and functions of Marxist-Leninist political economy; Chapters 2, 3, 4 present issues of goods and markets, production of surplus value, competition and monopoly in the market economy; Chapter 5

and 6 talks about the socialist-oriented market economy; industrialization, modernization and international economic integration in Vietnam in the transition period.

Scientific socialism: 02 credits

Content: The course consists of 7 chapters. Chapter 1 presents the basic introductory issues of scientific socialism (the foundation and development of scientific socialism). Chapters 2 to 7 present the contents of scientific socialism based on the objectives of the course.

History of the Communist Party of Vietnam: 02 credits

Content: The course provides students with the systematic and basic understanding about the founding of the Party (1920-1930), the process of the Party leading the struggle for power (1930-1945), leading two resistance wars against the French colonialists and American imperialists, liberating the nation, unifying the country (1945-1975), leading the country to socialism and carrying out Doi Moi (1975-2018). The course points out the successes and the limitations, and summarizes the experiences of the Party's revolutionary leadership in order to help students improve their awareness and belief in the Party and their ability to apply their learned knowledge into working practices, thus contributing to the construction and defense of the Socialist Vietnamese.

Ho Chi Minh Ideology: 02 credits

Content: The course consists of 6 chapters presenting the general knowledge about the research subjects, research methods as well as the concepts and origins of Ho Chi Minh thought; Ho Chi Minh's thought on national issues and socialism, Ho Chi Minh's thought on the Communist Party and state of Vietnam, great national unity, and international solidarity, culture and human morality.

National Defense Education: non-credit

Content: Consists of 3 parts

Part I equips students with basic knowledge about the research subjects and research methods of the course; The point of view of Marxism-Leninism, Ho Chi Minh's thought on war, army, and national defense; Developing people’s national defense and people's security; People's War to protect the Vietnam; Developing the Vietnamese people's armed forces; Combining socio-economic development with strengthening defense and security consolidation; Vietnamese military art. With the knowledge equipped, students will properly understand the origin, nature and characteristics of war, understand the Party's viewpoints on developing the people’s national defense, the people's armed forces, and defending the Socialist Republic of Vietnam,

Part II equips students with basic knowledge about the strategic prevention of "peaceful evolution", riots, and overthrows of hostile forces against Vietnam; Preventing enemy attacks with high-tech weapons; Developing militia and self-defense forces, reserve forces for mobilization and defense;

Building and protecting national sovereignty and borders; Some basic contents on ethnicity and religion and the struggle against the enemy from taking advantage of ethnic and religious issues to oppose the government; Basic issues of national security protection and maintenance of social order and safety; Basic issues of the fight against crime and social evils; Creating a movement for all people to protect national security. With this knowledge, students will have the confidence in the government in preventing "peaceful evolution", riots and subversion of hostile forces, to firmly defend Vietnam. Students can flexibly apply knowledge learned about national defense and security into practice in study and work.

Part III equips students with basic knowledge about: Teams of units and military triathlons; Using military topographic maps; Introduction to some types of infantry weapons; Explosives; Prevention of weapons of mass destruction; First aid for war wounds; One by one in offensive and defensive combat; Techniques of shooting submachine gun AK(CKC). With this, students will acquire general knowledge about the general military, the necessary military skills to meet the requirements of developing and strengthening the people's armed forces, ready to perform their duties to defend the Socialist Republic of Vietnam.

Physical Education: non-credit

Content:

Option 1- Chess: Equips students with the basic knowledge of the subjects, the theory for basic techniques - tactics of each stage of a game. Students will know how to think independently and creatively while solving tasks and situations arising in a chess game, master and apply basic tactical techniques into practice at each stage of the game. Students will also know how to apply this knowledge into other courses. The course aims to develop students' thinking ability, memory and psychological capacity, concentration, assertiveness, self-esteem and discipline.

Option 2 - Taekwondo: Equips students with some rules of Taekwondo competition. Students will understand the technical principles of foot strokes, hand moves, katas, and the fighting method of Taekwondo. Students can then proficiently perform the stances, hand and foot attacks, competition methods, and the No. 1 kata. The course aims to create excitement among students, and encourage them to actively exercise regularly in order to improve their health and to protect themselves.

Introduction to Law: 02 credits

Content: The course equips students with basic theoretical knowledge about the governments and laws. From this, students will gain an initial understanding of the origin, nature and characteristics of the government and laws; functions, roles, forms and types of governments; legal concepts and

legal forms; legal regulations, legal relations, legal system, law implementation, law violation, legal responsibility. Through the course, students are trained to obey the law in life.
Communication skills 1: 02 credits **Content:** The course provides students with basic knowledge about social thinking and basic communication skills in social professional activities. Students will master the basic scientific issues of communication psychology and effective communication principles in presentations, professional job interviews, self-analysis and self-assessment, in order to develop an authoritative personality, proactiveness, and confidence in the process of starting a career and lifelong learning. Students will know how to effectively apply listening, behavior, administration, problem solving, and life skills in communicating with customers and colleagues through the use of oral, written and body language in accordance with social and environmental ethical standards.
Communication skills 2: 02 credits **Content:** Introduce students to in-depth communication principles, which students will apply these principles to communication in life, work and study. Specifically, students will know how to apply effective communication principles in writing E-mails, notices, announcements, scientific reports, business documents to be sent to customers. Students will also be prepared with in-depth job interview and resume writing skills. While learning the skills of writing e-mails and writing reports, students will be given group exercises (in class or at home), thereby understanding the most effective ways to work in groups as well as how to communicate in the group.
General English 1: 3 credits **Content**: The course is taught for students not specializing in English Linguistics, containing the first 6 lessons from the World English 2 textbook (60 periods) and online learning with content compiled by the Center for Foreign Languages. This course provides students with basic English knowledge at an advanced level, helping students practice the 4 skills: listening, speaking, reading, writing and practice communication situations with common topics such as: personality, personal interests, making friends, health, lifestyle, milestones in life.
General English 2: 3 credits **Content**: The course is taught for students not specializing in English Linguistics, containing the 06 final lessons from the World English 2 textbook (60 periods) and online learning with content compiled by the Center for Foreign Languages. This level provides students with basic English knowledge at an advanced level, helping students continue to practice the 4 skills: listening, speaking, reading, practice communication situations with common topics such as: expensive luxury goods; nature; past life; travel; career and festival.

English for communication 1: 3 credits **Content**: The course is taught for students not specializing in English linguistics, consisting of the first 50% of the content from the Campus TOEIC textbook (60 periods) and an online exercise system compiled by the Center for Foreign Languages. Students continue to study English at an advanced level, practice the 4 of skills in listening, speaking, reading, and writing, and practice real communication situations with native teachers, while at the same time get acquainted with the skills to take the TOEIC test.
English for communication 2: 3 credits **Content:** The course is taught for students not specializing in English linguistics, consisting of the last 50% of the content from the Campus TOEIC textbook (60 periods) and an online exercise system compiled by the Center for Foreign Languages. Students continue to study English at an advanced level, practice the 4 skills of listening, speaking, reading, and writing, and practice real communication situations with native teachers, while developing skills for taking the TOEIC test.
Start-up: 02 credits **Content:** Provide students with basic knowledge and skills in annual planning for departments within a company and start-up projects, such as: an overview of the business plan, the content and the planning process of a business plan, information gathering, marketing plan, production plan, personnel plan, financial plan, risk analysis in business planning, business plan evaluation and issues in practice, how to implement a sample business plan.
General Physics A1 (2 theoretical credits): **Content:** The course provides students with fundamental knowledge of Newtonian classical mechanics about the fundamental laws of dynamics, Newton's laws and Galilean's principle of relativity conservation theorem in mechanics, two basic forms of motion of solids. Students will understand the basic science of thermomolecular motion and the basic principles of thermodynamics in social practice.
Calculus A1 (2 credits): **Content:** The course provides students with basic knowledge of linear algebra about determinants, matrices, linear equation systems, vector spaces, and quadratic forms. Students will understand and know how to apply computational skills in the process of solving specific technical and technological problems, meeting the requirements set forth in practical social activities of engineering and technological industries.
Calculus A2 (2 credits):

Content: The course continues to provide students with basic background knowledge about limits, continuity, calculus of integrals of functions of one variable, series, differentials and multivariable function value. Students will understand and know how to apply computational skills in the process of solving technical and technological math functions, meeting the goals set out in practical social activities of engineering and technology industries.

Probability & Statistics: 02 credits

Content: The course continues to provide students with the conceptual foundation, methodology of trial and random events, probability and probability formulas, random variables and probability distribution, sample theory, sample parameter estimation, sample hypothesis testing. Students will understand and know how to apply computational skills in the process of solving, processing, analyzing, evaluating probability problems, estimating and testing practical scientific hypotheses in humanistic socio-economic activities.

Microsoft Office Specialist 1 (MOS 1): 02 credits

Content: The course deals with into issues related to: Basic concepts of information technology (informatics, information technology), the process of collecting, processing, storing and transmitting information (input, export, etc.); The concept of operating system and their operations; concepts and methods of managing folders/files on the computer; changing options in the Control Panel, Internet usage; Creating, presenting, formatting, managing, maintaining, and sharing documents on Microsoft Word.

Creative thinking: 02 credits

Content: The course provides students with basic knowledge about creative scientific cognitive thinking in scientific, technical, technological activities of social life. Students will understand and apply the laws and principles of creative thinking in analyzing, evaluating, and choosing the optimal, feasible and effective solution to make decisions in each area of application, thus being able to create innovations for the future. The course also helps students become confident in their own creative ability, and actively promote their ability to form creative ideas, to develop creative business ideas in the process of starting a business and lifelong learning, in order to meet the diverse and abundant social needs in terms of improving productivity, working efficiency. Students will be able to create innovative products, new products and new initiatives into practical activities.

Calculation method: 02 credits

Content: The course continues to provide students with theoretical background knowledge about errors, polynomial interpolation methods, approximate solutions to equations, derivatives, definite integrals, and differential equations. ordinary differential. Students will understand and apply skills

in calculating the allowable error levels into the process of finding feasible optimal solutions for specific technical and technological problems, socio-economic functions, meeting the goals set out in the practical social activities of students' chosen fields and majors.
Linear programming: 02 credits **Content:** The course provides students with theoretical background knowledge of linear programming about simplex algorithms, dual problems, transport problems, PERT - CPM network diagram methods. Students will understand and know how to apply the skills of establishing and calculating in the process of solving matrix problems in order to choose the optimal solution for economic and technical functions in practical social activities.
Introduction to food technology: 02 credits **Content:** The course introduces students to the roles and responsibilities of the food technology industry in the current globalized context through direct contact with businesses; thereby orienting students to set the necessary personal goals to increase their competitive advantage after graduation. In addition, the course also introduces an overview of the curriculum as well as important skills to be acquired during the study.
General Chemistry: 03 credits **Content:** The course is worth 3 theoretical credits, and provides the following contents: - Atomic structure and periodic system of chemical elements. - Theories of molecular structure and substance structure. - Theoretical foundations of chemistry on thermodynamics and kinetics. - Chemical processes in solution. - Theory of dispersion systems, properties of dispersion systems, and steps in preparing colloidal systems and stabilize colloidal systems.
General chemistry lab: 01 credit **Content:** The course is worth 1 practical credit, and provides the following contents: Lesson 1- Laboratory techniques; Lesson 2- Determination of density; determination of aluminum equivalents; Lesson 3 - Determination of reaction order; Lesson 4 - Buffer solutions; Lesson 5- Color indicator and its application in determining pH levels and dissociation constant of weak acids and weak bases; Lesson 6- Volumetric analysis.
Food chemistry: 04 credits **Content:** The course consists of 3 theoretical credits and 1 practical credit. Theoretical contents include: - Types of bonds, types of effects, types of isomers of organic molecules, mechanisms of organic reactions, basic methods of synthesizing organic compounds - Structure, properties and functions of protein, lipid, glucide, vitamin components, etc. - Application of protein, lipid, glucid components, etc. in food processing technology. Practical contents include: qualitative and

quantitative experiments to help students better understand the properties and technological features of some ingredients in food such as proteins, carbohydrates, lipids, etc. through experimental methods.
Food Biochemistry: 04 credits **Content:** The course consists of 3 theoretical credits and 1 practical credits. Theoretical contents include: the structure, properties and functions of the main structural components of the cell: - The process of metabolism of major substances in living organisms. - Structure and properties of enzymes, enzymatic reactions that are related to the structure, state, color and quality of food products. Practice contents include: qualitative and quantitative experiments to help students gain practical knowledge about investigating the activity and kinetics as well as the catalytic properties of a number of enzymes that are widely applied in food technology.
Food additives: 02 credits **Content:** Introduction, definition, and classifications of preservatives, additives to improve color, smell, taste and structure for food; Safety standards and usage of food additives.
Food microbiology: 05 credits **Content:** The course includes 4 theoretical credits and 1 practical credits. Theoretical contents include: Part 1. Basics of microbiology: introduction to the origin, characteristics and role of microorganisms as well as morphology and physiology of microorganisms; Part 2: Microorganisms in food science: food microbiology, a brief overview of microbial changes in food, some applications such as harmful effects of microorganisms in food; Part 3: Methods of evaluating criteria in food microbiology, including: microbiological criteria normally controlled in water and food, requirements for sampling, sample handling, and sample reception in laboratories, and important biochemical tests used in the qualitative examination of microorganisms. Practical contents include: - Preparation of culture medium - Study of morphological characteristics of microorganisms - Methods to check the presence of some types of microorganisms in food.
Food sanitation, safety and regulation: 03 credits **Content:** The course provides and present detailed knowledge of: - Food safety and food hygiene: this knowledge help students understand the importance of ensuring food safety and hygiene. As a result, the course will deeply analyze the agents that cause food insecurity (physical agents, chemical agents, biological agents); the causes of infection of these agents in food as well as the harmful effects of contaminated food on human health, and measures to prevent these agents to prevent food poisoning.

- Sources of environmental pollution in food processing factories, causes, and ways to prevent food-borne infections. - Management of water resources (supply and wastewater) in food processing plants
Nutrition: 03 credits **Content:** The course introduces relationship between nutrition, health and food, allowing students to create a nutritional plan to ensure the health of individuals and communities. Students will learn about the nutritional composition of food, human nutritional needs and nutritional balance, nutrition in relation to the health status of the body. Students will also know how to apply the principles of food groups in order to develop menus for reasonable meals, promote health, and ensure productivity for all types of workers.
Food Analysis 1: 04 credits **Content:** The course provides the basic contents in food analysis including: understanding experimental errors, analyzing experimental data and evaluating analytical methods, quantitative analysis, precipitation, acid balance- base, redox, complexation, titration and their applications.
Food Analysis 2: 03 credits **Content:** The course equips students with food analysis techniques including methods and their applications. These analytical methods are applied mainly in food analysis. In addition, the pros and cons of the methods will be discussed. The course content includes introduction to food analysis, sampling and sample preparation, statistical analysis of experimental data, color analysis, chromatography, electrophoresis ,etc.
Food sensory evaluation: 03 credits **Content:** This course aims to equip students with basic knowledge of sensory evaluation techniques - techniques that use human senses to recognize, describe and quantify the sensory properties of food products, as well as to measure people's liking for products. With this knowledge, students will understand the principles of good practices, basic tests belonging to the main test groups including: discrimination, description and taste. In addition, students are also trained in the ability to analyze and interpret the results obtained from these measurements so that they can apply these measurements in solving real-life situations that may be encountered in fields such as: quality control, research - product development.
Food Engineering 1: 04 credits **Content:** This course provides an introduction to essential math knowledge and engineering principles applied in food processing. Topics include: functions, limits, differentials, integrals,

partial differential equations, dimensional conversions, materials and process properties, mass and energy balances.
Food Engineering 2: 04 credits **Content:** The course provides students with knowledge about the nature of processes in food engineering, theoretical problems of processing processes in food, some of the equipment used in these processes. The acquired knowledge will help students understand the nature of food engineering processes to control food quality during processing.
Professional English 1: 03 credits **Content:** The course provides students with knowledge about methods of reading and understanding specialized documents in Food Technology and methods of translating technical documents in English.
Professional English 2: 03 credits **Content:** The course helps students practice and improve reading comprehension, translation, and analysis of specialized documents of Food Technology in English.
Design and Analysis of Experimental Data: 02 credits **Content:** The course provides the following content: - Planning method to find optimal conditions for conducting experiments - Methods of handling experimental results.
Research methodology: 02 credits **Content:** The course helps students develop a scientific mindset, develop research hypotheses, conducting experiments, evaluating results, discussing and presenting research results.
Introduction to molecular biology: 02 credits **Content:** This course provides basic knowledge about genetics. From there, the course will continue with the structure, function, and interactions of macromolecules in the cell. For students of Food Technology, by understanding the nature of cells, they will be able to apply food processing processes to create quality products.
Food Science: 02 credits **Content:** This course provides students with an understanding of the basic chemical reactions that occur during food processing, the physical principles, the material properties and the microstructural properties of foods. This course also deals with methods of stabilizing the biological properties of foods through the inhibition, isolation or inactivation of food modifiers; methods of stabilizing the physicochemical properties of foods through means of stabilizing complex and dispersed components in food systems such as emulsions, foam systems, systems consisting of proteins and polysaccharides.

Heating and Refrigeration Technology: 02 credits **Content:** The course provides students with the principles and operation of cold-heat processes applied in food processing.
Fundamentals of food processing: 04 credits **Content:** The course provides the general contents related to food quality control, food processing principles and techniques, as well as techniques in processing vegetables, fruits, beverages, dairy products, food, etc. In addition, students will learn about the processes and factors in food processing. With the basic knowledge in food science and engineering, students will have a broader view and be equipped with the knowledge in order to dive deeper into the field of Food Technology.
Food Packaging and Preservation: 04 credits **Content:** The course focuses on introducing the contents of quality control and the principles of processes and techniques in food preservation. In addition, the course also provides knowledge about food packaging, methods of packaging food products, etc.
Food quality management: 04 credits **Content:** The course provides and presents detailed knowledge of: Quality management systems (ISO 9001, TQM, GMP, SSOP, HACCP); Analyzing the interaction of quality management systems being applied in the food industry; Evaluating the advantages and limitations of each quality management system; Developing food processing technology processes based on ISO standards; Analyzing and controlling hazards during the food production processes.
Project on food product development: 02 credits **Content:** In this course, students will apply the basic and the foundational knowledge of food processing, and the principles for operating machinery and equipment in order to develop new products and process new ingredients. The course aims to develop students' professional competence in research and developing food products.
Project on food plant design and operations: 01 credits **Content:** This course helps students to apply basic industry knowledge and specialized knowledge of food technology in order to develop a complete technological process from a specific food ingredient, calculate the balance of matter and energy, and select the appropriate devices. Students will also create layout plan for a processing facility.
Nutritional value of food: 02 credits **Content:** The course provides students with knowledge about macronutrients and micronutrients in foods that affect the health of consumers. The course also provides students with knowledge and skills to analyze and evaluate the nutritional value of food products for different groups of

consumers in order to achieve sustainable development of public health, as well as to see the value of food products.
Milk and Dairy Product Processing Technology: 03 credits **Content:** The course provides students with knowledge about the properties and chemical composition of milk, requirements in the process of collecting, transporting and preserving milk while transporting from farms to the factory; processing methods of pasteurized milk, UHT milk, powdered milk, sweetened condensed milk and dairy products such as yogurt, butter, cheese. In addition, the course also include a the course also include a practical section (equivalent to 1 practical credit) where students will apply the knowledge learned in order to create products from dairy ingredients and dairy products.
Meat and Seafood Processing Technology: 03 credits **Content:** The course provides students with knowledge about the composition and nutritional value of meat and seafood ingredients; the production process of processed meat products such as sausages, and the process of processing and preserving seafood ingredients such as salting, drying, fish sauce, frozen, canned food, etc. In addition, the course also include a the course also include a practical section (equivalent to 1 practical credit) where students will apply the knowledge learned in order to create products from meat and seafood.
Beverage processing technology: 03 credits **Content:** This course aims to provide knowledge about beverage processing technology. Students are introduced to the materials used in the alcoholic fermentation process to produce beers and wines. There are also beverage processing processes (preparation of syrup, mixing, saturation of carbon dioxide, etc.). With this, students will have the basic knowledge to be able to work and study intensively in this field. In addition, the course also include a the course also include a practical section (equivalent to 1 practical credit) where students will apply the knowledge learned to create beverage products.
Sugar and Confectionery Processing Technology: 03 credits **Content:** The Sugar Production section will provide students with knowledge of sugar production materials, raw material handling and transportation processes, methods of sugarcane juice collection, chemical processing and decontamination processes in sugarcane juice, process of sugar water evaporation, sugar crystallization and some indicators in the analysis of cane sugar. The Confectionery Processing section provides students with knowledge about ingredients, processing processes, changes taking place in processes and machinery in the process of making breads, cookies, snacks, and candies such as hard candies, soft candies, chewing gum, marshmallows, and

chocolate. In addition, the course also include a the course also include a practical section (equivalent to 1 practical credit) where students will apply the knowledge learned to create confectionery products.
Fruit and Vegetable Processing Technology: 03 credits **Content:** This course provides some principles and ways to analyze for some vegetables and fruits, helping students understand and comprehend the types of fresh fruits and vegetables. From this, they can apply the knowledge they have learned into preserving and processing products made from fresh fruits and vegetables. In addition, the course also include a the course also include a practical section (equivalent to 1 practical credit) where students will apply the knowledge learned to create products from vegetables.
Cereals and Grains Processing Technology: 03 credits **Content:** This course provides the following content: - Food preservation: composition, physical, chemical and biochemical properties of food and factors affecting those properties, preservation methods, storage - Food processing technology: raw materials, products, technological processes and technological processes for rice products, bread, instant noodles, flour and tapioca. In addition, 1 practice credits will apply the knowledge learned to create products from food.
Tea, Coffee and Cocoa Processing Technology: 03 credits **Content:** This course aims to equip students with knowledge about tea, coffee and cocoa production technology; status and future development trends of the industry. Through this course, students will understand the characteristics of raw materials, knowledge about post-harvest technology, processing technology of some popular products from tea, coffee and cocoa. From this, students will have an understanding of materials as well as understand some basic processes to be able to work and do in-depth research in this field.
Crops processing technology: 03 credits **Content:** This course provides students with knowledge about the characteristics and properties of groups of agricultural products, harvesting methods, and post-harvest preservation. In addition, this course also covers the technological process of processing agricultural products such as fruits, wheat, corn, rice, and spices, etc.
Functional foods: 02 credits **Content:** This course provides students with an understanding of trends in dietary supplements and nutrition, principles of ingredient selection, and dietary supplement processing methods. In addition, this course also deals with the application of health ingredients in beverage processing technology,

baked products, salad dressings, as well as the application of new technologies in functional cereal processing and nutrition, new approaches to enhance the functionality of fermented products.
Risk assessment of food: 02 credits **Content:** The course presents the purpose and approach to food risk assessment and describes each step in the food risk assessment process. Steps to perform food risk management include: (i) Hazard identification, (ii) Exposure assessment, (iii) Hazard characterization and (iv) Risk characterization. Students will effectively use the data generated in the risk assessment process to ensure food quality.
Food supply chain and traceability: 02 credits **Content:** The course provides knowledge of food supply chain management including: authenticity, inventory management, transportation management, logistics relationships and third-party services, the role of information in supply chain management, a reference model of supply chain operations. In addition, the course will also equip students with the principles and basic requirements of a traceability system, steps in identifying information and exchanging common traceability information and other common methods of information exchange, as well as the tools and techniques for tracing food products applied in domestic and global supply chains.
Food business: 02 credits **Content:** This course presents the principles of food business and marketing. In addition, the course also equips students with skills to integrate food knowledge into analyzing food quality and safety; skills to develop and operate production processes and control product quality for the purpose of commercializing food products with economic efficiency.
Agri-food analysis and assessment: 04 credits **Content:** The course provides students with knowledge on how to evaluate sustainability metrics in agri-food systems; changes resulting from new policies, products or technologies as a result of the evolution of food systems into highly complex supply chains. Students will learn to include this knowledge in the analysis of agro-food systems, the current or future state of sustainability, the trade-offs between various economic, environmental and social factors, while considering the serious realities when providing directions for policymakers.
Food laws and regulations: 02 credits **Content:** This course provides students with knowledge of food law and regulations, as well as circulars/ decrees guiding the implementation of domestic and foreign laws in particular, and standards related to food processing plants, standards for ingredients, products, packaging, labeling, additives, etc.
Project on food quality assurance: 01 credits

Content: This course helps students apply knowledge of food quality management, food safety and hygiene into the food processing process. Students will develop a HACCP plan for a laboratory-scale for a food processing procedure, with focus on identifying significant hazards, identifying CCPs, introducing control measures for CCPs, critical thresholds, monitoring CCPs, predicting failures, and taking corrective action.
Food toxicology and allergies: 03 credits **Content:** The course provides an understanding of the complexities of chemicals in food and the impact of foods containing environmental contaminants or natural toxins on human health. In addition, the course also includes the impact of contaminants on nutrient utilization, the harmful effects of nutrient excess, toxic metabolism in foods, and the body's biological defense mechanism against the toxic substance. Students will also be able to discover the risk identification process, learn how foods are managed for safety, the causes of allergies, and assess the current state of management processes.
Internship: 07 credits **Content:** After this internship, students will understand the specific problems of each factory, each process that students have participated in, thereby drawing the relationship between theory and reality, allowing them to apply theoretical knowledge into analyzing and explaining real-life phenomena. At the same time, students will also apply the knowledge they have learned to complete a report.
Graduation thesis: 10 credits **Content:** After receiving the research topic, students will conduct research directly under the guidance of the instructor. Upon completion, students will write a report and present it to a committee established by the faculty.

Appendix II: Course specification of all courses in the program
Link (log in to access the course specifications): https://phongdaotao2.ntt.edu.vn/sinh-vien-dang-nhap.html

DEAN

(signed)

Dr. Trần Thị Như Trang