

**MINISTRY OF EDUCATION & TRAINING
HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY & EDUCATION**

UNDERGRADUATE PROGRAM

Major of
FOOD TECHNOLOGY

2018

UNDERGRADUATE PROGRAM

Education Program: FOOD TECHNOLOGY

Level: Undergraduate

Major: FOOD TECHNOLOGY

Type of Program: Full time

(Decision No.....date....on.....)

1. Duration of Study: 4 years

2. Student Enrollment: High-school Graduates

3. Grading System, Curriculum and Graduation Requirements

Grading System: 10

Curriculum: Based on regulations of Decision No 43/2007/BGDDT

Graduation Requirements:

General condition: Based on regulations of Decision No 43/2007/BGDDT

Condition of specialty: None

4. The objectives and Expected Learning Outcomes

Goals

Training human resources, improving intellectual standards of the people, fostering talents; researching science and technology for new knowledge & product creation to meet the requirements of development of economics & society, to ensure national defense, security and international integration.

Training learners have political quality, morality, knowledge, professional practice skills, research capacity, development of scientific applications and technologies that are commensurate with the level of training. They have a healthy body, creative capability and professional responsibility, adaptability to the work environment; spirit of serving the people.

Training **Food Technology** major have basic scientific knowledge, fundamental knowledge, specialized knowledge of food technology majors, analysis capability, solve problem skills and solutions assessment, ability contribution, design, operation of mechanical systems, communication skills and work in a team, professional attitudes, meet the development requirements of major and society. After graduation, the graduates are able to work in companies, factories, industrial manufactories, institutes, colleges and universities.

Objectives

PO1: Form a stable foundation of general knowledge, foundation and core knowledge and specialized/ major knowledge of **Food Technology**.

PO2: Use proficiently self-studying skills major, problem solving skills and professional skills in the major of **Food Technology**.

PO3: Communicate effectively, organize, lead and conduct teamwork.

PO4: Apply well competences of brainstorming, designing, deploying, and operating the systems of **Food System**.

PO5: Be able to grasp society's needs, carry out social responsibilities, respect work ethics and be aware of life-long learning

Program outcomes

A. General knowledge, fundamental and specialized knowledge of food technology major:

ELO 1. Apply fundamental knowledge of mathematics, natural science and social science; achieve more specialized knowledge and study further at higher levels.

ELO 2. Construct the basis of core technological knowledge about **Food Technology**.

ELO 3. Create the combination of advanced specialized knowledge in the fields of **Food Technology**.

B. Specialized and professional skills in food technology major:

ELO 4. Analyze and argue for technical matters; brainstorm systematically, and solve mechanical matters.

ELO 5. Examine and experiment mechanical matters.

ELO 6. Implement proficiently professional skills in the mechanical field.

C. Communication skills and ability to work in multidiscipline areas:

ELO 7. Work independently; lead and work in a team.

ELO 8. Communicate effectively in various methods: written communication, mechanical drawing communication, graphics and presentation.

ELO 9. Use English in communication.

ELO 10. Realize the roles and responsibility of engineers and social circumstance which has impacts on the technical activities of industry.

ELO 11. Comprehend business culture, work ethics principles, and working style of industrial organizations.

ELO 12. Be aware of life-long learning.

D. Skills to take shape of ideas, design, deploying and operate system of food technology

ELO 13. Take shapes of ideas, set up requirements, determine functions and elements of food technology fields.

ELO 14. Design required elements of food technology fields.

5. Blocks of knowledge in the whole program: 130 credits (*without Physical Education, Military Education, and Supplementary Courses*)

6. Allocation of credits

Groups of Courses	No. of Credits		
	Total	Compulsory	Optional
Foundation science courses	43	39	4
Political Education	12	12	
Social Sciences and Humanities	4		4
Mathematics and Natural Sciences	21	21	
Technical Computer Sciences	3	3	
Introduction to Food Technology	3	3	
Food Technology Courses	87	78	9
Food Science	14	14	
Food Engineering	10	10	
Food Processing	20	20	
Project and Practice	24	24	
Industry Internship and Related Fields of Food Technology	9		9
Graduation thesis	10	10	
Total (<i>not excluding Physical Education, Military courses and Supplementary Courses</i>)	130	117	13

7. CONTENTS OF THE PROGRAM

7.1 Foundation science courses (43 credits)

No.	Course's ID	Course Name	Credits	Semester	Lecturers (Notes)
Political Education			12		
	LLCT150105E	Principles of Marxist-Leninism	5	1	
	LLCT120314E	Ho Chi Minh's Ideology	2	2	
	LLCT230214E	Vietnamese Communist Party Policy of Revolution	3	4	
	GELA220405E	General Laws	2	6	
Social Science and Humanities (optional)			4	2	(choose 4 credits)
	GEEC220105E	General Economics	2	2	
	ULTE121105E	Learning Methods in University	2	2	
	PLSK320605E	Planning Skill	2	2	
	INMA220305E	Introduction to Management	2	2	
	INSO321005E	Introduction to Sociology	2	2	
	IQMA220205E	Introduction to Quality Management	2	2	
	INLO220405E	Introduction to Logics	2	2	
	PRSK320705E	Presentation Skills	2	2	
	SYTH220505E	Systems Thinking	2	2	
	ULTE121105E	University Learning Methods	2	2	
	IVNC320905E	Vietnamese Culture	2	2	
	TDTS320805E	Writing Scientific and Technical Documents	2	2	

Mathematics and Natural Sciences			21		
	MATH141601E	Calculus 1	4	1	
	MATH141701E	Calculus 2	4	2	
	MATH141801E	Calculus 3	4	3	
	AMME230250E	Applied Mathematics in Food Technology	3	3	Dr. Nguyễn Thái Anh
	PHYS130402E	Principles of Physics 1	3	1	
	GCHE130603E	General Chemistry for Engineers	3	1	Dr. Nguyễn Vinh Tiến
Technical Computer Sciences			3		
	CAED220150E	Basic of Computer Aided Design (CAD)	2+1	3	MSc. Nguyễn Văn Sơn (1 lab)
Introduction of Food Technology			3		
	IFNT130150E	Introduction to Food Technology	2+1	1	
Physical Education			(5)		
	PHED110513E	Physical Education 1	(1)	1	
	PHED110613E	Physical Education 2	(1)	2	
	PHED130715E	Physical Education 3	(3)	3	
Military Education			(3)		
	GDQP008031E	Military Education	(3)		
Total (not excluding Physical Education, Military courses and Supplementary Courses)			43		

7.2 Food Technology Courses (89 Credits)

7.2.1 Food Science Courses (14 credits)

No.	Course's ID	Course Name	Credits	Semester	Lecturers
	OCHE120450E	Organic Chemistry	2	2	Dr. Võ Thị Ngà
	PCHE220750E	Physical Chemistry of Food	2	4	Dr. Nguyễn Thị Nhung
	ACHE220850E	Analytical Chemistry	2	4	Dr. Phan Thị Anh Đào
	FANA221050E	Food Analysis	2	4	Dr. Nguyễn Vinh Tiến
	FCHE120550E	Food Chemistry	2	2	Dr. Hoàng Minh Hào
	FBIO220450E	Food Biochemistry	2	3	Dr. Vũ Trần Khánh Linh
	FMIC220350E	Food Microbiology	2	3	Dr. Trịnh Khánh Sơn
Total			14		

7.2.2. Food Engineering Courses (10 credits)

No.	Course's ID	Course Name	Credits	Semester	Lecturers
	EDDG120250E	Descriptive Geometry & Technical Drawing	2	2	MSc. Mai Đức Dãi
	PFPE120350E	Principle of Food Processing and Food Processing Equipments	2	2	MEng. Lê Tấn Hoàng
	HETE220550E	Heat Transfer and Equipments	2	3	Dr. Nguyễn Tấn Dũng
	MATE220950E	Mass Transfer and	2	4	Dr. Nguyễn Tấn Dũng

		Equipments			
	FPPD320150E	Food Process and Plant Design	2	5	Dr. Lại Quốc Đạt
Total			10		

7.2.3. Food Processing Courses (20 credits)

No.	Course's ID	Course Name	Credits	Semester	Lecturers
1	MSPR320250E	Meat and Seafood Processing	2	5	Dr. Lê Ngọc Liễu
2	TCCP320350E	Tea, Coffee and Chocolate Production	2	5	Dr. Vũ Trần Khánh Linh
3	BCPR320450E	Bakery and Confectionary Production	2	5	Dr. Vũ Trần Khánh Linh
4	CEPR321150E	Cereals Processing	2	6	Dr. Phạm Thị Hoàn
5	VFBP321250E	Vegetable, Fruit Processing and Beverage Production	2	6	Dr. Nguyễn Vũ Hồng Hà
6	DRDP321350E	Dairy and Related Dairy Production	2	6	Dr. Phạm Thị Hoàn MEng. Đặng Thị Ngọc Dung
7	FETE321450E	Fermentation Technology	2	6	Dr. Trịnh Khánh Sơn
8	FSEV221350E	Sensory Evaluation of Food	2	4	Dr. Phạm Thị Hoàn
9	FPAC420150E	Food Packaging	2	7	Dr. Trịnh Khánh Sơn
10	FRDE420250E	Food Research and Development	2	7	Dr. Lê Ngọc Liễu
Total			20		

7.2.3. Industry Internship and Related Fields of Food Technology (9 credits)

Student selects 09 optional credits

No.	Course's ID	Course Name	Credits	Semester	Lecturers
	ININ420450E	<i>Industry Internship</i>	2	7	All lecturer
	FQMA410350E	<i>Food Quality Management*</i>	1	7	
	FAIN320550E	<i>Food Additives** (optional)</i>	2	5	Dr. Phạm Thị Quỳnh
	FNUT320850E	<i>Food Nutrition** (optional)</i>	2	5	Dr. Phạm Thị Quỳnh
	FSAF320950E	<i>Food Safety** (optional)</i>	2	5	Dr. Phạm Thị Quỳnh
	AFMI320650E	<i>Analysis in Food Microbiology (optional)</i>	2	3	
	FBIO320750E	<i>Food Biotechnology (optional)</i>	2	4	
	PTEC320850E	<i>Postharvest Technology (optional)</i>	2	4	Dr. Vũ Trần Khánh Linh
	EFOP320950E	<i>Edible Fats and Oils Production (optional)</i>	2	5	Dr. Vũ Trần Khánh Linh
Total			9		

**This course can be replaced by a Certificated of ISO and HACCP*

***Suggested courses*

7.2.3. Project and Practice course (24 credits)

No.	Course's ID	Course Name	Credits	Semester	Lecturers
1	POCH210650E	<i>Practice of Organic Chemistry</i>	1	3	Dr. Võ Thị Nga
2	PFAN320750E	<i>Practice of Food Analysis</i>	3	5	Dr. Hoàng Minh Hào
3	PFCB211250E	<i>Practice of Food Biochemistry</i>	1	4	Dr. Vũ Trần Khánh Linh
4	PFMI221150E	<i>Practice of Food Microbiology</i>	2	4	Dr. Trịnh Khánh Sơn
5	PFPM321050E	<i>Project of Food Processing and Machinery</i>	2	6	All lecturers
6	PMSP321550E	<i>Practice of Meat and Seafood Processing</i>	2	6	Dr. Nguyễn Tiến Lực
7	PTCP321650E	<i>Practice of Tea, Coffee and Chocolate Production</i>	2	6	Dr. Nguyễn Tiến Lực MEng. Nguyễn Đăng Mỹ Duyên
8	PBCP321750E	<i>Practice of Bakery and Confectionary Production</i>	2	6	Dr. Vũ Trần Khánh Linh
9	PCPR410550E	<i>Practice of Cereals Processing</i>	1	7	MEng. Nguyễn Đăng Mỹ Duyên
10	PVFP420650E	<i>Practice of Vegetable, Fruit Processing and Beverage Production</i>	2	7	Dr. Nguyễn Vũ Hồng Hà
11	PDRP420750E	<i>Practice of Dairy and Related Dairy Production</i>	2	7	MEng. Đặng Thị Ngọc Dung
12	PFTE410850E	<i>Practice of Fermentation Technology</i>	1	7	Dr. Trịnh Khánh Sơn
13	PFSE310650E	<i>Practice of Sensory Evaluation of Food</i>	1	5	Dr. Phạm Thị Hoàn
14	TOFT420950E	<i>Topic of Food technology</i>	2	7	
Total			24		

7.2.3 Graduation thesis (10 Credits)

No.	Course's ID	Course Name	Credits	Semester	Lecturers
1	GRAT410150E	Graduation Thesis (Food Technology)	10	8	

(*) SUPPLEMENTARY COURSES (11 Credits)

No.	Course's ID	Course Name	Credits	Notes
1	EHQT130137E	Academic English 1	(3)	1 st semester
2	EHQT230237E	Academic English 2	(3)	2 nd semester
3	EHQT230337E	Academic English 3	(3)	3 rd semester
4	EHQT230437E	Academic English 4	(3)	4 th semester
5	TEEN123750E	Technical English 1	(2)	3 rd semester
6	TEEN233850E	Technical English 2	(3)	4 th semester

8. Plan of Courses

1st Semester:

Number	Course's ID	Course Name	Credits	Prerequisite
1	INFT130150E	Introduction to Food Technology	2+1	
2	LLCT150105E	Principles of Marxist-Leninism	5	
3	MATH141601E	Calculus 1	4	
4	PHYS130402E	Principles of Physics 1	3	
5	EHQT130137E	Academic English 1	(3)	
6	PHED110513E	Physical Education 1	(1)	
7	EHQT230237E	Academic English 2	(3)	
8	GCHE130603E	General Chemistry for Engineers	3	
Total (not excluding Physical Education and Supplementary Courses)			18	

2nd Semester:

Number	Course's ID	Course Name	Credits	Prerequisite
1	EDDG120250E	Descriptive Geometry & Technical Drawing	2	
2	MATH141701E	Calculus 2	4	
3		Social Science and Humanities (optional)	4	
4	PFPE120350E	Principle of Food Processing and Food Processing Equipments	2	
5	OCHE120450E	Organic Chemistry	2	
6	FCHE120550E	Food Chemistry	2	
7	LLCT120314E	Ho Chi Minh's Ideology	2	
8	EHQT230337E	Academic English 3	(3)	
9	TEEN123750E	Technical English 1	(2)	
10	PHED110613E	Physical Education 2	(1)	
Total (not excluding Physical Education and Supplementary Courses)			18	

3rd Semester:

Number	Course's ID	Course Name	Credits	Prerequisite
1	CAED220150E	Basic of Computer Aided Design (CAD)	2+1	
2	MATH141801E	Calculus 3	4	
3	AMME230250E	Applied Mathematics in Food Technology	3	
4	FMIC220350E	Food Microbiology	2	
5	FBIO220450E	Food Biochemistry	2	
6	HETE220550E	Heat Transfer and Equipments	2	
7	POCH210650E	<i>Practice of Organic Chemistry</i>	1	
8	TEEN233850E	Technical English 2	(3)	
9	PHED130715E	Physical Education 3	(3)	
Total (not excluding Physical Education and Supplementary Courses)			17	

4th Semester:

Number	Course's ID	Course Name	Credits	Prerequisite
1	LLCT230214E	Vietnamese Communist Party Policy of Revolution	3	
2	PCHE220750E	Physical Chemistry of Food	2	

3	ACHE220850E	Analytical Chemistry	2	
4	MATE220950E	Mass Transfer and Equipments	2	
5	FANA221050E	Food Analysis	2	
6	PFMI221150E	<i>Practice of Food Microbiology</i>	2	
7	PFCB211250E	<i>Practice of Food Biochemistry</i>	1	
8	FSEV221350E	Sensory Evaluation of Food	2	
9	EHQT230437E	Academic English 4	(3)	
10	GDQP008031E	Military Education	(3)	
Total (not excluding Supplementary Courses)			16	

5th Semester:

Number	Course's ID	Course Name	Credits	Prerequisite
1	FPPD320150E	Food Process and Plant Design	2	
2	MSPR320250E	Meat and Seafood Processing	2	
3	TCCP320350E	Tea, Coffee and Chocolate Production	2	
4	BCPR320450E	Bakery and Confectionary Production	2	
5	FAIN320550E	<i>Food Additives* (optional)</i>	2	
6	PFSE310650E	<i>Practice of Sensory Evaluation of Food</i>	1	
7	PFAN320750E	<i>Practice of Food Analysis</i>	3	
8	FNUT320850E	Food Nutrition* (optional)	2	
9	FSAF320950E	Food Safety** (optional)	2	
Total			18	

6th Semester:

Number	Course's ID	Course Name	Credits	Prerequisite
	GELA220405E	General Laws	2	
1	PFPM321050E	<i>Project of Food Processing and Machinery</i>	2	
2	CEPR321150E	Cereals Processing	2	
3	VFBP321250E	Vegetable, Fruit Processing and Beverage Production	2	
4	DRDP321350E	Dairy and Related Dairy Production	2	
5	FETE321450E	Fermentation Technology	2	
6	PMSP321550E	<i>Practice of Meat and Seafood Processing</i>	2	
7	PTCP321650E	<i>Practice of Tea, Coffee and Chocolate Production</i>	2	
8	PBCP321750E	<i>Practice of Bakery and Confectionary Production</i>	2	
Total			18	

*This courses can be replaced by the others optional courses in “Industry Internship and Related Fields of Food Technology”

7th Semester:

Number	Course's ID	Course Name	Credits	Prerequisite
1	FPAC420150E	Food Packaging	2	
2	FRDE420250E	Food Research and Development	2	
3	FQMA410350E	<i>Food Quality Management*</i>	1	
4	ININ420450E	<i>Industry Internship**</i>	2	
5	PCPR410550E	<i>Practice of Cereals Processing</i>	1	

6	PVFP420650E	<i>Practice of Vegetable, Fruit Processing and Beverage Production</i>	2	
7	PDRP420750E	<i>Practice of Dairy and Related Dairy Production</i>	2	
8	PFTE410850E	<i>Practice of Fermentation Technology</i>	1	
9	TOFT420950E	Topic of Food technology	2	
Total (not excluding Physical Education, Military courses and Supplementary Courses)			15	

**This courses can be replaced by the others optional courses in “Industry Internship and Related Fields of Food Technology”*

***This course will be taken in summer (after 7th semester)*

8th Semester:

Number	Course's ID	Course Name	Credits	Prerequisite
1	GRAT410150E	Graduation Thesis (Food Technology)	10	
Total (not excluding Physical Education, Military courses and Supplementary Courses)			10	

9. COURSE DESCRIPTION AND WORKLOAD

9.1 FOUNDATION SCIENCE COURSES

Calculus I

Credits: 4

Distribution of learning time: 4 (4/0/8)

Prerequisites: None

Former subjects of condition: None

Course Description: This course helps students review the general and advanced mathematical knowledge: Cardinality of a set: rational numbers, real numbers, complex numbers. Limit: function, limit of a function, continuous function. Differential calculus: derivative, differential, Taylor-Maclaurin expansion, the survey on function, curve in polar coordinates. Calculus of single variable: volume fraction uncertainty, definite integrals, generalized integrals. Chain: Chain number, string functions, power series, Taylor-Maclaurin sequence, Fourier series, Fourier expansion, trigonometric series.

Textbook:

1. K. Smith, M. Strauss and M. Toda –*Calculus* - 6th National Edition–Kendall Hunt.

Calculus II

Credit: 4

Distribution of learning time: 4 (4/0/8)

Prerequisites: None

Former subjects of condition: Calculus I

Course Description: This course provides the learnerwith contents: Matrix-determinant: the matrix, the form of matrix, inverse matrix, determinants, matrix classes. System of Linear Equations: linear systems, Cramer rule, Gauss method, homogeneous system. Space Vector: Space Vector, subspace, linear independence, linear dependence, basis, dimension, Euclidean space. Diagonal matrix-quadratic form: eigenvalues, eigenvectors, private space, diagonal matrix, quadratic form, canonical form, the surface level 2. Differential calculus of function of several variables: function of several variables, derivative, differential, extreme of function of several variables, calculus applications in geometry in space.

Textbook:

1. K. Smith, M. Strauss and M. Toda –*Calculus* - 6th National Edition–Kendall Hunt.

Calculus III**Credit: 4**

- *Distribution of learning time: 4 (4/0/8)*
- *Prerequisites: None*
- *Former subjects of condition: Calculus II*
- *Course Description:* This course provides the learner with contents: multiple integral: double integral, application for calculated area of flat domain, calculate the surface area, object volume, triple integrals, and applications for the object volume. Line integral: line integral type one and applications, line integral type two and applications, Green formula, condition of line integral does not depend on integrating line. Surface integral: Integral surface type one, type two, the Ostrogradski formula, vector field, flux and divergence, vector format of Ostrogradski formula, Stokes formula, circulation and vortex vector, vector format of Stokes formula.

Textbook:

1. K. Smith, M. Strauss and M. Toda –*Calculus* - 6th National Edition–Kendall Hunt.

Principles of Physics 1**Credit: 3**

- *Distribution of learning time: 3(2/1/6)*
- *Prerequisites: None*
- *Former subjects of condition: None*
- *Summaries of course:* This course provides the learner with contents: the mechanics: point dynamics, the law of conservation, solid motion. Thermodynamics: kinetic molecular theory, principles of Thermodynamics I, principles of Thermodynamics II. Electricity and magnetism: electric field, magnetic, variability of electrical magnetic field.
- *Text book:* R.A. Serway và J.W. Jewett. *Physics for Scientists and Engineers with Modern Physics*, 8th Edition

General Chemistry for Engineers (GCHE130603)**(3 credits)**

- *Distribution of learning time: 3(2/1/6)*
- *Prerequisites: None*
- *Former subjects of condition: None*
- *Summaries of course:* This course provides general chemistry necessary for engineering and science. This course covers fundamentals of electronic structures of atoms, relationship of electron and atomic properties, geometric configuration of the molecule, the polarity of the molecules, link of the physical molecules, a preliminary study on the physical and chemical properties of inorganic substances and their structures.
- *Text book:* Lawrence S. Brown, *Chemistry for Engineering Students*, Brooks/Cole, Cengage Learning, 2nd edition, 2011, 608 papers

FOOD TECHNOLOGY COURSES**Introduction to Food Technology****Credits: 3***Distribution of learning time: 3 (2/1/6)**Prerequisites: None**Former subjects of condition: None**Course Description:*

This course introduces the basic information of HCMC University of Technology and Education, Faculty of Chemical and Food Technology, and Department of Food Technology. This course introduces the programme of Food Technology. This course introduces the general knowledge of food technology.

Textbook:

1. Trịnh Khánh Sơn. *Introduction to Food Technology* (handout)
2. Nguyễn Đăng Mỹ Duyên. *Introduction to Food Technology* (handout)

3. Food Technology-IFT
(<http://www.ift.org/knowledge-center/learn-about-food-science/what-is-food-science.aspx>)
4. FDA U.S. Food & Drug Administration
(<https://www.fda.gov/Food/default.htm>)
5. Codex Alimentarius International Food Standards
(<http://www.fao.org/fao-who-codexalimentarius/about-codex/en/>)

Organic Chemistry Credits: 2

Distribution of learning time: 2 (2 /0/4)

Prerequisites: None

Former subjects of condition: None

Course Description:

This course equips fundamental knowledge of organic chemistry with emphasis on nomenclature, isomerism, structure, stereochemistry, reactions, and synthesis of organic compounds. The chemistry of Hydrocarbons, Alcohols, Aldehydes, Ketones, Carboxylic acids and their derivatives are explored in detail. The course strategy focuses on the relationships between molecular structure, chemical reactivity, and physical properties.

This module supports the basic knowledge of organic chemistry as a foundation for deeper learning the fundamental courses and specific courses in Food Technology, including: Food biochemistry, Food microbiology, Food chemistry, Food processing and preservation, Food storage, Food nutrition.

This is the foundation for students to acquire basic knowledge of the natural sciences so that they can continue on higher education or further studying in different areas of science and technology.

Textbook:

1. David Klein, Organic Chemistry, John Wiley & Sons Inc., 2nd edition, 2012, 1364.
2. David Klein, Student study guide & solutions manual Organic Chemistry, John Wiley & Sons Inc., 1st edition, 2012, 721.

Food Chemistry Credits: 2

Distribution of learning time: 2 (2 /0/4)

Prerequisites: None

Former subjects of condition: None

Course Description:

Students majoring in food technology will perceive the basic scientific principles in structures, properties, functions of food constituents, including water, protein, enzyme, carbohydrate, lipid, vitamin, mineral, aroma compounds and food additives. From which students will have a comprehensive evaluation of foods. As a consequence, they can apply their knowledge in production and preservation of foods. Firstly, students will be offered a foreword of properties and roles of water in food. Thereafter, the learners will be supplied the structures, physical and chemical properties of carbohydrate, lipid, protein and enzyme. Next, many kinds of vitamins and minerals will be transferred to students, composing of the chemical and physical properties their presences in foods. Finally, some basic principles of aroma compounds and food additives will be introduced to learners.

Textbook:

1. Belitz H.D., Grosch W., *Food Chemistry*, Vol 1, 2, 3 (900 pages), Berlin-New York 1999.
2. Hoàng Kim Anh, *Hóa học thực phẩm*, NXB Khoa học & Kỹ thuật, 2005.

Food Microbiology Credits: 2

Distribution of learning time: 2 (2 /0/4)

Prerequisites: None

Former subjects of condition: None

Course Description:

This course introduces the general knowledge of microbiology. This course introduces the structure and function of cell organelles. This course introduces factors affecting the growth and survival of microorganism in foods. This course introduces the types of microorganism in raw material, food process and equipment, final product. This course introduces the advantages and disadvantages of microorganism in foods.

Textbook:

1. M.R. Adams and M.O.Moss. 2005. Food Microbiology. Second Edition. Royal Society of Chemistry. UK. 2. Physics 1 lectures summary, University of Technology and Education, HCMC.
2. Nguyễn Lâm Dũng (chủ biên). 2011. Vi sinh vật học. Phần 1. Thế giới vi sinh vật. Nhà xuất bản khoa học kỹ thuật
3. Nguyễn Lâm Dũng (chủ biên). 2011. Vi sinh vật học. Phần 2. Sinh lý học-Sinh hóa học-Di truyền học-Miễn dịch học và Sinh thái học vi sinh vật. Nhà xuất bản khoa học kỹ thuật.

Food Biochemistry

Credits: 2

Distribution of learning time: **2 (2/0/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

This module provides requisite knowledge on the biosynthesis and catabolism of food components such as carbohydrates, fatty acids, amino acids in living cells to help students understand their beneficial effects on human health. Principles of bioenergetics and mitochondria energy metabolism are also covered. In addition, the properties of enzymes and enzyme kinetics are introduced to provide basic framework for further study on these biological reaction catalysts. Some chemical reactions involving these molecules with relation to processing and storage are also discussed.

Textbook:

1. David L. Nelson and Michael M.Cox, Lehninger Principles of Biochemistry – 6th Edition, W. H. Freeman and Company, New York, 2013.
2. Jeremy M. Berg et al., Biochemistry - 7th Edition, W. H. Freeman and Company, New York, 2012
3. Benjamin K. Simpson, Food Biochemistry and Food Processing, Second Edition, John Wiley & Sons, Inc., 2012.

Heat Transfer and Equipments

Credits: 2

Distribution of learning time: **2 (2 /0/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

The aim of this course helps students understand, study, and apply whole knowledge of heat transfer processes and heat transfer equipment such as:

- Theory of heat transfer; Heat transfer equipment; Heat transfer models;
- Heating and cooling processes; Cooling and condensing processes; Evaporation and sublimation processes;
- The concentrating and crystallizing process;
- Pasteurization process;
- The cooling and freezing process

Textbook:

1. Heldman, Food Engineering – 3rd Edition, International Series.
2. Nguyen Tan Dzung., (2015). The method to determine the rate of freezing water inside

freezing product, Lap Lambert Adecamic Publishing.

3. Nguyen tan Dzung, Heat transfer – 1st Edition.
4. Nguyen Tan Dzung., (2013). Heat Transfer and Equipment, Part 1, 2 & 3. NXB ĐHQG TpHCM, năm 2013.
5. Albert Ibarz, Gustavo V. Barbosa- Canovas, *Unit Operation in Food Engineering*, CRC Press, 2003.
6. Jean-Jacques Bimbenet, Albert Duquenoy, Gilles Trystram, Dunod, Génie des procédés alimentaires, des bases aux applications, 2002, Paris.

Practice of Organic Chemistry Credits: 2

Distribution of learning time: 2 (2 /0/4)

Prerequisites: None

Former subjects of condition: None

Course Description:

This course is an intensive introduction to the techniques of experimental organic chemistry and gives students an opportunity to learn and master the basic chemistry lab techniques for carrying out experiments. These organic chemistry lab techniques include Transfer and Extraction Techniques, Purification of Solids by Recrystallization, Purification of Liquids by Distillation and Purification of Organic compounds by Chromatography.

Textbook:

2. Danald L. Pavia, A Microscale Approach to Organic Laboratory Techniques, Brooks/Cole, Cengage learning, 5th edition, 2013, 1042.
3. James W. Zubrick, The Organic Chem Lab survival manual, John Wiley & Sons, Inc, 8th edition, 2011, 374.

Physical Chemistry of Food Credits: 2

Distribution of learning time: 2 (2/0/4)

Prerequisites: None

Former subjects of condition: None

Course Description:

The course equips Food Technology students with a basic knowledge of transport phenomena, water activity, dispersed systems and rheology properties of liquid and solid foods. This is the basis for students to comprehend and work effectively with systems and processes exploited in the field of Food technology.

Textbook:

1. Pieter Walstra, *Physical Chemistry of Foods*, CRC Press, 2002, 832 pages.
2. Coupland, John. *An introduction to the physical chemistry of food*. Springer, 2014.

Analytical chemistry of Food Credits: 2

Distribution of learning time: 2 (2/0/4)

Prerequisites: None

Former subjects of condition: None

Course Description:

This course helps students review the general, definitions, basic knowledge about the types of concentrations, units, and statistics. In addition, this course will provide basic theory and quantitative methods to determine the concentration of elements and chemical compounds.

This is the foundation for students to acquire relevant knowledge related to physical chemistry, food chemistry, food analysis as well as the foundation for the implementation of subject projects, graduation project and scientific research.

Textbook:

1. Douglas A. Skoog, Donald M. West, F. James Holler, *Analytical Chemistry*, Saunders College Publishing, United States of America, 1994.
2. John Kenkel, *Analytical Chemistry for technicians*, CPR Press, Taylor & Francis Group,

London.

Mass Transfer and Equipments Credits: 2

Distribution of learning time: **2 (2 /0/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

The aim The aim of this course helps students understand, study, and apply whole knowledge of mass transfer processes and mass transfer equipment such as:

- Theory of mass transfer; Mass transfer equipment; Mass transfer models;
- Absorption processes; Adsorption processes
- Extracting and dissolving processes
- Distillation processes
- Food drying processes

Textbook:

1. R Paul Singh – Dennis R Heldman, Food Engineering – 3rd Edition, International Series.
2. Dennis R Heldman, Handbook Food Engineering – 3rd Edition
3. Nguyen tan Dzung, Mass transfer – 1st Edition, Publication University of Nation Ho Chi Minh City VietNam.
4. Nguyen Tan Dzung., (2013). Mass Transfer and Equipment, Part 1, 2 & 3. Publication University of Nation Ho Chi Minh City VietNam, năm 2013.
5. Albert Ibarz, Gustavo V. Barbosa- Canovas, *Unit Operation in Food Engineering*, CRC Press, 2003.
6. Jean-Jacques Bimbenet, Albert Duquenoy, Gilles Trystram, Dunod, Génie des procédés alimentaires, des bases aux applications, 2002, Paris.

Food Analysis Credits: 2

Distribution of learning time: **2 (2/0/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

This course is designed to provide students a clear understanding of the principles behind various methods and instruments that are commonly used in food industry and academic research labs to quantitatively analyze and characterize the main components of food, like moisture, ash, lipids, proteins, carbohydrates, vitamin, as well as physical properties of food, like colour and viscosity.

Textbook:

1. Nielsen, S. Suzanne, ed. *Food analysis*, 4th edition. New York: Springer, 2010.
2. Tran Bich Lam, Food Analysis Laboratory Experiments, Ho Chi Minh City National University Publishing, 2013.

Practice of Food Microbiology Credits: 2

Distribution of learning time: **2 (0/2/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

This course introduces the general skills in practice of food microbiology. This course introduces how to identify the shape, size, organization and basic characteristics of micro-organism. This course introduces how to measure the quality of micro-organism in raw material and food products

Textbook:

1. Harley Prescott. 2002. Laboratory Exercises in Microbiology, 5th Edition. The McGraw Hill

2. Ciira Kiiyukia. 2003. Laboratory Manual of Food Microbiology. Unido Project.
3. Trịnh Khánh Sơn. 2017. Các kỹ thuật cơ bản trong thực nghiệm Vi sinh vật học. Nhà xuất bản Đại học quốc gia TP.HCM.

Practice of Food Biochemistry

Credits: 1

Distribution of learning time: **1 (0/1/2)**

Prerequisites: **None**

Former subjects of condition: **None**

Course Description:

Equip students with the basics of biological catalysis, metabolic pathways and biosynthesis in living cells in general and food materials in particular. Consider the biochemical interactions between food ingredients and the effect of these changes on food processing and preservation.

Equip students with knowledge of the processes of metabolism and modification of food and food ingredients, understanding the mechanisms of metabolism and the application and proper control of the processes involved. Out in food processing and preservation

Textbook:

1. Tran Bich Lam et al., *Food Biochemistry Experiment*, Ho Chi Minh National University Publisher, 2005
2. Pham Thi Tran Chau - *Biochemistry* - Vietnam Education Publisher 2011
3. Hoang Kim Anh, *Food Chemistry*, Science & Technology Publishing House, 2005

Sensory Evaluation of Food

Credits: 2

Distribution of learning time: **2 (2/0/4)**

Prerequisites: **None**

Former subjects of condition: **None**

Course Description:

This course equips learners with basic concepts and knowledge about sensory evaluation of food as well as the interaction mechanisms of odor and taste compounds to sensory cells on the senses (taste and smell). At the same time, it helps learners to approach the sensory evaluation methods such as Discrimination testing, Description testing and Affective testing. Further less, it helps learners to approach some of the data processing methods commonly used in quality assessment and product development research.

Textbook:

1. Lawless H. T., Heymann H., *Sensory evaluation: Principles and Practices*, Springer Press, 2010.
2. Nguyen Hoang Dung, *Sensory evaluation of Food: Principles and Practices*, 2007, HCMC National University, 2007.
3. O'Mahony Michael, *Sensory Evaluation of Food: Statistical Methods and Procedures* Food Science and Technology, Marcel Dekker, Inc, 1986.
4. Morten Meilgaard, *Sensory Evaluation Techniques*, CRC Press, 1999.
5. 3. Mason R., *Sensory Evaluation Manual*, The University of Queensland, 2002.

Food Process and Plant Design

Credits: 2

Distribution of learning time: **2 (2/0/4)**

Prerequisites: **None**

Former subjects of condition: **None**

Course Description:

This course provides students with the principles of food process and plant design which are approached as conceive – design – implement– operate (CDIO) concept.

The students will be trained the knowledge on food process and food plant in order to apply for analysis, evaluation and design of a food plant and its elements. After completion of this course, they can apply the knowledge and skills for food process and plant design as well as implementation and operation of food plant.

The content of this course consists of 10 chapters.

This subject aims to help students be familiar with activities of project of food plant design, from conceiving a plan, designing food plant and its elements: capacity, products, source of materials, process with mass and energy balance, estimation of equipment, water supply, waste treatment, plan of plant operation and economic engineering. In order to achieve this goal, this course will focus on the combination of understanding of principles and required skills for designing a food process and plant through a project students have to carry out in groups.

Besides that, this course will help the students know how to analyze and evaluate the feasibility and effectiveness of a project of food plant. In addition, this course will also enhance the creativeness and team work skills of students through conducting a design of food plant project.

Textbook:

1. Zacharias B. Maroulis and George D. Saravacos, Food Plant Economics, CRC Press, 2008, 352 pages
2. Antonio López-Gómez and Gustavo V. Barbosa-Cánovas, Food Plant Design, CRC Press, 2005, 372 pages
3. Zacharias B. Maroulis and George D. Saravacos, Food Process Design, CRC Press, 2003
4. Joseph Irudayaraj, Food Processing Operations Modeling: Design and Analysis, Marcel Dekker Inc., 2002
5. Jasim Ahmed and Mohammad Shafi ur Rahman, Handbook of Food Process Design, Wiley – Blackwell, 2012, 1470 pages
6. G. D. Saravacos and A. E. Kostaropoulos, Handbook of Food Processing Equipment, Kluwer Academic/Plenum Publishers, 2002
7. D. R. Heldman and R. W. Hartel, Principles of Food Processing, Aspen Publishers, 1998
8. Perry, R.H. and Green, D.W., Perry's chemical engineers' handbook, 7th ed, New York McGraw-Hill
9. D.R. Heldman and D.B Lund, Handbook of Food Engineering, CRC Press, 2007

Meat and Seafood Processing Credits: 2

Distribution of learning time: **2 (2/0/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

This course provides learners with basic knowledge regarding the ingredients and nature of ingredients used in food, methods of preservation, processes and changes in meat and fish processing. Providing the knowledge and skills for learners to understand about food and meat processing technologies. Moreover, the course also supplies the understanding about conducting, preserving and processing food products in the processing plant, evaluating the quality of products. This course will help learners to understand the role and the importance of nutrition in meat, fish and processing technology, as well as food quality control.

The subject provides students with a methodological approach when learning deeply in food processing technology. At the same time, it improves the knowledge of meat processing technology and seafood processing, creating conditions for students to integrate into the international economy regarding import and export meat, shrimp and fish products. Furthermore, it could help food technology to be developed and planned in food processing plants

Textbook:

1. R. A. LAWRIE, 1998. Lawrie's meat science, Woodhead Publishing limited, 336 p.
2. H. R. CROSS, 1988. Meat science, milk science and technology, Elsevier science publishers B. V., 449 p.

3. FAO, 1991. Guidelines for slaughtering, meat cutting and further processing, 162 p.
4. A. M. PEARSON, 1996. Processed meats, Chapman & Hall, 438 p
5. Paule DURAND, 1999. Technologies des produits de charcuterie et des salaisons, Tec&Doc, 515 p
6. Nguyễn Trọng Căn, (2008). Technology of canned seafood and poultry. Scientific and technical publishing house
7. Nguyễn Trọng Căn, (2006). Seafood processing technology. Volume 1 & 2. Agricultural Publishing House
8. Lê Văn Việt Mẫn (2008). Food processing technology. Vietnam National University Ho Chi Minh City publishing house

Tea, Coffee and Cocoa Production

Credits: 2

Distribution of learning time: **2 (2/0/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

The course provides knowledge and skills so that students can:

- Production and consumption of tea, coffee and cocoa in Vietnam and in the world;
- Biochemical changes after post-harvest, storage and pre-processing; Quality control of raw materials;
- Processing of tea, coffee, and cocoa, the biochemical changes during processing of tea, coffee and cocoa
- Product quality standards and assurance.

Textbook:

1. Wintgens Jean Nicolas (Editor). Coffee: Growing, Processing, Sustainable Production: A Guidebook for Growers, Processors, traders, and Researchers. 2nd updated edition. 2009. Wiley-VCH.A. Chakraverty, A.S. Mujumdar, H.S. Ramaswamy (editors). Handbook of Postharvest Technology: Cereals, Fruits, Vegetables, Tea, and Spices. 1st Edition, 2003. CRC.
2. Stephen T. Beckett. 2008. The Science of Chocolate. Royal Society of Chemistry, 2nd edition.
3. Ivon Flament. Coffee Flavor Chemistry (Hardcover). 2001. Willey.
4. Chi-Tang Ho, Jen-Kun Lin, Fereidoon Shahidi. Tea and Tea Products (Nutraceutical Science and Technology): Chemistry and Health-promoting properties. 1st Edition. 2008. CRC Press

Bakery and Confectionery Production

Credits: 2

Distribution of learning time: **2 (2/0/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

This module provides students with an understanding of the baking and confectionery ingredients as well as their basic functions in bakery and confectionery production. The manufacturing techniques, changes to ingredients in each manufacturing stage, equipment and process control of some bakery and confectionery production processes are then covered.

Textbook:

1. Duncan Manley, *Technology of biscuits, crackers and cookies*, Woodhead Publishing Limited, Cambridge England, 2000.
2. Y. H. Hui et al, *Bakery Products Science and Technology*, Blackwell Publishing, 2006.
3. W. P. Edwards, *The Science of Sugar Confectionery*, RSC Paperbacks, UK, 2000.
4. R. Lees, E. B. Jackson, *Sugar Confectionery and chocolate manufacture*, Blackie

Practice of Food Sensory Evaluation**Credits: 1***Distribution of learning time:* **1 (0/1/4)***Prerequisites:* *None**Former subjects of condition:* *None**Course Description:*

This course will help learners:

- To review the basics of sensory evaluation of food;
- To know how to organize and operate a Sensory Evaluation Program such as experimental design and statistics, and especially the perceptual process.

Textbook:

1. Stonne H., Sidel J., Sensory Evaluation practices, Third Edition, Elsevier, 2004.
2. O'Mahony Michael, Sensory Evaluation of Food: Statistical Methods and Procedures Food Science and Technology, Marcel Dekker, Inc, 1986.
3. Morten Meilgaard, Sensory Evaluation Techniques, CRC Press, 1999.
4. Mason R., Sensory Evaluation Manual, The University of Queensland, 2002.
5. Lawless H. T., Heymann H., Sensory evaluation: Principles and Practices, Springer Press, 2010.
6. Nguyen Hoang Dung, Sensory evaluation of Food: Principles and Practices, 2007, HCMC National University, 2007.

Practice of Food Analysis**Credits: 3***Distribution of learning time:* **3 (0 /3/6)***Prerequisites:* *None**Former subjects of condition:* *None**Course Description:*

This course will equip students with methods to determine the basic components of food products such as protein, glucid and lipid of food products.

Equip students with a number of techniques for processing different food samples before conducting the analysis. From there, it helps students to accumulate enough knowledge as well as practical skills for analytical methods other than enterprises.

Textbook:

S.Suzanne Nielsen. 2003. Food Analysis. 3rd edition. Kluwer Academic/Plenum Publishers.

Food Nutrition**Credits: 2***Distribution of learning time:* **2 (2/0/4)***Prerequisites:* *None**Former subjects of condition:* *None**Course Description:*

The course examines the food nutrients and the metabolism of foods in the human body, factors influencing nutritional status and requirements over the life cycle. The cultural and socio-economic factors which underline food selection and methods of food preparation, and their impacts on health are also addressed. The course also discusses the effects of nutrient deficiency and malnutrition, and overweight and obesity on individuals and community.

Textbook:

1. Lori A. Smolin and Mary B. Grosvenor, Nutrition: science and applications, Hoboken, NJ: Wiley, 2nd edition, 2010
2. Mark Lawrence and Tony Worsley (editors), Public health nutrition: from principles to practice, Sydney: Allen & Unwin, 2007.

Food Safety**Credits: 2***Distribution of learning time:* **2 (2/0/4)***Prerequisites:* *None**Former subjects of condition:* *None**Course Description:*

This course provides students with some concepts of food hygiene and safety, food safety hazards in the process of food receipt, processing, processing and preservation. In addition, this module introduces measures to prevent and ensure food safety.

Textbook:

1. RH. Schmidt, GE. Rodrick. *Food Safety Handbook*. John Wiley & Sons, 2003
2. J. McLauchlin, C. Little. *HOBBS' Food Poisoning and Food Hygiene*. Hodder Arnold
3. J. Selamat, S. Z. Iqbal. *Food Safety-Basic Concepts, Recent Issues, and Future Challenges*. Springer, 2016
4. S. S. Deshpande. *Handbook of Food toxicology*. Marcel Dekker, 2002
5. W. Helferich, C. K. Winter. *Food toxicology*. CRC Press, 2001
6. C. Shaw. *Food Safety-The Science of Keeping Food Safe*. John Wiley & Sons, 2013

Cereals Processing**Credits: 2***Distribution of learning time:* **2 (2/0/4)***Prerequisites:* *None**Former subjects of condition:* *None**Course Description:*

This module equips learners with basic knowledge about raw materials and technologies of processing food products such as rice, noodles, starch ... This course will help learners understand basic knowledge about Technological processes, product changes during processing, operation principles of machines used in the processing of food products. Based on that, learners will be able to research and develop food products to diversify the current food products.

Textbook:

1. David AV Dendy PhD. *Cereals and cereal products chemistry and technology*. 2001.
2. MEng Nguyen Dang My Duyen - Food Processing Technology slide
3. Tran Minh Tam, Preservation and processing of post-harvest agricultural products, Agricultural Publishing, Hanoi 2000.
4. Hoang Van Duoc. Drying technology Science and Technology Publishing, Hanoi 1999.
5. Bui Duc Hoi. Preservation of food Hanoi Science and Technology Publishing.

Vegetable, Fruit Processing and Beverage Production**Credits: 2***Distribution of learning time:* **2 (2/0/4)***Prerequisites:* *None**Former subjects of condition:* *None**Course Description:*

This course equips students with knowledge about:

- The biochemistry and physiology of post-harvested fruit and vegetable.
- The principles of thermal and non-thermal techniques associated with fruit and vegetable processing
- The basic steps involved in the fruit and vegetable processing.
- The processing techniques, methods on the product quality inspection and operate the processing chains to produce fruit based beverage products.

Textbook:

1. Wim Jongen. 2002. Fruit and Vegetable processing: Improving quality. Woodhead Press.
2. Philip R. Ashurst. 1998. Chemistry and Technology of Soft Drinks and Fruit Juices.

Continuum International Publishing Group.

3. H. Johnson, J. Halliday. Wine Science, 2nd Edition. Academic Press.
4. C. Cantarelli, G. Lanzarini. (1989). Biotechnology Applications in Beverage Production. Elsevier Science Publishers Ltd.
5. Nirmal Sinha, Jiwan Sidhu, Jozsef Barta, James Wu, M.Pilar Cano. (2012) Handbook of Fruits and Fruit Processing (2nd eds). Wiley-Blackwell
6. Evranuz, E. Özgül.; Hui, Yiu H. (2016). Handbook of vegetable preservation and processing (2nd eds). CRC Press

Dairy and Related Dairy Production

Credits: 2

Distribution of learning time:

2 (2/0/4)

Prerequisites:

None

Former subjects of condition:

None

Course Description:

Dairy and Dairy Products provides the tools for students to learn how to transform milk into high quality products. Students will acquire a thorough understanding of milk composition, milk chemistry, milk microbiology, milk processing, unit operations, and alternative technologies for whey processing. Students will be able to recognize procedures needed to produce high quality dairy products and alternative technologies for whey processing, production and isolation of health promoting bioactive compounds from milk and dairy products.

Textbook:

1. Dairy Science and Technology, Pieter Walstra, Jan T.M. Wouters, and Tom J. Geurts, Second Edition, Taylor and Francis Group, 2006.
2. Engineering Aspects of Milk and Dairy Products, Jane Selia dos Reis Coimbra, Jose A Teixeira, Hoboken: Taylor and Francis. Online resource. Publication Date: 2010
3. Engineering Aspects of Milk and Dairy Products, Jane Selia dos Reis Coimbra, Jose A Teixeira, Hoboken: Taylor and Francis. Online resource. Publication Date: 2010.

Fermentation Technology

Credits: 2

Distribution of learning time: **2 (2/0/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

This course introduces the general knowledge fermentation technology. This course introduces how to prepare a fermentation process in both laboratory and industrial scales. This course introduces the microbial growth kinetic in fermentation process. This course introduces typical types of fermentation. This course introduces how to apply the fermentation in food technology

Textbook:

1. P.F. Stanbury, A. Whitaker and S.J. Hall. 1995. Principles of Fermentation Technology, 2nd edition. Butterworth Heinemann
2. Trịnh Khánh Sơn. 2017. Bài giảng môn học Công nghệ lên men. ĐH Sư phạm kỹ thuật TP.HCM

Practice of Meat and Seafood Processing

Credits: 2

Distribution of learning time: **2 (0/2/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

This course equips learners with the basics of meat and fish processing. Students need to have the knowledge and skills to conduct experiments in meat and fish processing

technology at the food laboratory. This course will help learners understand the role and importance of meat, seafood, biochemical changes and food processing methods, as well as create specific products.

This subject helps student understand methodology when practicing food processing technology. Moreover, improving knowledge of meat and seafood processing technology will help students have the overview of economic market and strategies. It also provides learners with the ability to process and produce meat, shrimp and fish products when building and planning food technology in plants.

Textbook:

1. Kerry J., Kerry J., Ledward D., Meat Processing: Improving Quality, CRC Press, Boca Raton, 2002
2. Nguyen Tien Luc, PH.D. Curriculum of Meat and Seafood Processing. Vietnam National University Ho Chi Minh City publishing house, 2016
3. Nguyen Tien Luc, PH.D. Practice lecture of Meat and Seafood Processing

Practice of Bakery and Confectionery Production

Credits: 2

Distribution of learning time: **2 (0/2/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

The target of this course is to have a more in-depth understanding of the relation between: ingredients, recipes and recipe buildup, and some variations in bakery and confectionery products. The focus of this course is mainly on the practical work. However, importance is also laid on the theoretical element in order to get a sound background and to be confident and in control of the process. Each day will start with brief and precise theoretical lessons containing the essential details before the practical part starts. This will help to see, predict and figure out what can be done or not. Finally, it will be interesting to compare theory and the practical results of the practice trials.

Textbook:

1. Duncan Manley, *Technology of biscuits, crackers and cookies*, Woodhead Publishing Limited, Cambridge England, 2000.
2. Y. H. Hui et al, *Bakery Products Science and Technology*, Blackwell Publishing, 2006.
3. W. P. Edwards, *The Science of Sugar Confectionery*, RSC Paperbacks, UK, 2000.
4. R. Lees, E. B. Jackson, *Sugar Confectionery and chocolate manufacture*, Blackie Academic & Professional, 2000.
5. Wheat Marketing Center, Inc, *Wheat and Flour Testing Methods – A guide to Understanding Wheat and Flour Quality*, Wheat Marketing Center, Inc, Portland, Oregon, USA, 2004.

Food Packaging

Credits: 2

Distribution of learning time: **2 (2/0/4)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

This course provides students with knowledge about:

- Historical aspects of the development of packaging technology, functions, future directions and standards required for food packaging materials.
- The productions of raw materials used in food packaging, the conversion industry for packaging solutions, and the packaging needs of the food industry
- The material properties and processing technologies applying to produce the packaging appropriate for the food market.
- Influences of packaging on the quality and shelf life of food products.

Textbook:

1. G. L. Robertson (2006). Food Packaging: Principles and Practice. CRC Press, Taylor & Francis Group.
2. A.L. Brody, E. P. Strupinsky, L. R. Kline. (2001). Active Packaging for Food Applications. CRC Press
3. M. A.P.R. Cerqueira, R.N.C. Pereira, O. L. da S. Ramos; J. A. C. Teixeira and A. A. Vicente. (2016). Edible Food Packaging: Materials and Processing Technologies. CRC Press

Food Research and Development

Credits: 2

Distribution of learning time:

2 (2/0/4)

Prerequisites:

None

Former subjects of condition:

None

Course Description:

This subject requires students to synthesize and apply all knowledge related to food technology. Students need to understand the composition, nature of materials, technological processes, equipment, packaging and variations in food preservation and processing.

This course provides students with basic knowledge about new products, research methods, food quality, food products research and development methods. At the same time, it provides learners with the knowledge and skills to manage, develop and research in the processing plants. Moreover, this subject helps learners have an approach, methodology when learning deeply about research and development of new products, methods of organizing and developing products.

Textbook:

1. Aaron L. Brody, John B. Lord (2000), *Developing New Food Products for Changing Marketplace*, Technomic Publishing Company, Inc. Pennsylvania, USA
2. Earle M, Earle R and Anderson A. (2001), *Food Product Development*, Woodhead Publishing Limited, Cambridge England.
3. McDonal J. (2003), Course Note: *Food Product Development*, University of Queensland, Australia.
4. W. James Harper W.J., Harris R., and Litchfield J. (2002), *Food Product Development (FST 650 Syllabus)*. Ohio State University
5. Hà Thanh Toàn (2002), *New Product Development Lecture, Agriculture and Applied Biology, Can Tho University*.

Food Quality Management

Credits: 1

Distribution of learning time:

1 (1/0/2)

Prerequisites:

None

Former subjects of condition:

None

Course Description:

This module provides the basic knowledge about food quality and methods to manage food quality; the role and importance of food quality management activities at factories. This module provides the principles and practices of food industry good manufacturing practices (GMPs), HACCP, and the ISO 9000 quality management system standards.

Textbook:

1. Alli, Inteaz. Food quality assurance : principles and practices., 2004
2. National Advisory Committee on Microbiological Criteria for Foods. Hazard analysis and critical control point principles and application guidelines. Adopted, 1997

Practice of Cereals Processing

Credits: 1

Distribution of learning time:

1 (0/1/2)

Prerequisites: None

Former subjects of condition: None

Course Description:

This course includes cereal practical sessions such as: starch processing, modified starch processing, pasta processing, rice noodle processing... This course will help learners understand the principles of the technological process, impact of processing on cereal products, and the operation of machines used in the cereal process

Textbook:

1. Kent, N. L. Technology of cereals: an introduction for students of food science and agriculture. - 4th edited. Elsevier Science Ltd, 1994.
2. Gavin Owens. Cereals processing technology. Woodhead Publishing Limited and CRC Press LLC, 2001

Practice of Tea, Coffee, and Cocoa Production

Credits: 2

Distribution of learning time: 2 (0/2/4)

Prerequisites: None

Former subjects of condition: None

Course Description:

Practical Tea, coffee and cocoa processing technology is based on , Tea, coffee and cocoa processing technology theory, it supports students have conditions to test the knowledges that they learned about this subject. Students have opportunities to practice on equipments to make some tea, coffee and cocoa products. Subject content includes:

- Test the quality criteria of raw tea, coffee and cocoa.

The technical brief gives an overview of the types of tea, coffee and cocoa processing that are possible at a small scale of operation, such as: Green tea, bottled green tea, instant coffee, canned coffee, cocoa powder,

- Research and development of new tea, coffee and cocoa products.

Textbook:

1. Chi – Tang Ho, Jen – Kun Lin, Fereidoon Shahidi, *Tea and Tea Products: Chemistry and Health Promoting – Properties*, CRC Press, 2009, 305 pages
2. Beckett, S., T., *Industrial Chocolate Manufacture and Use*, Blackwell Publishing, 4th Edition 2009, 688 pages. Beckett, S., T., *The Science of Chocolate*, RSC publishing, 2nd Edition, 2008, 240 pages
3. Clarke, R. J. and Vitzthum, O. J., *Coffee – Recent Developments*, Blackwell Science, 2001.
4. Practical tea, coffee and cocoa products processing technology, Dang Thi Ngoc Dung – Ho Thi Thu Trang, Ho Chi Minh city Technology & education university, 2013.

Practical Dairy and Related Dairy Production

Credits: 2

Distribution of learning time: 2 (0/2/4)

Prerequisites: None

Former subjects of condition: None

Course Description:

Practical Dairy and Related Dairy Products is based on Dairy & related Dairy products theory, it supports students have conditions to test the knowledges that they learned about this subject. Students have opportunities to practice on equipments to make some Dairy products. Subject content includes:

- Test the quality criteria of raw milk, dairy products.
- The Technical Brief gives an overview of the types of dairy processing that are possible at a small scale of operation, such as: Pasteurised milk; Flan, Butter, yoghurt; Cheese-making; Ice cream production and Dairy confectionery, dried milk powder,....

Research and development of processing new Dairy products

Textbook:

1. Practical dairy products processing technology, Dang Thi Ngoc Dung – Ho Thi Thu Trang, Ho Chi Minh city Technology & education university, 2013.
2. Dairy Science and Technology, Pieter Walstra, Jan T.M. Wouters, and Tom J. Geurts, Second Edition, Taylor and Francis Group, 2006.
3. Engineering Aspects of Milk and Dairy Products, Jane Selia dos Reis Coimbra, Jose A Teixeira, Hoboken: Taylor and Francis. Online resource. Publication Date: 2010
4. Engineering Aspects of Milk and Dairy Products, Jane Selia dos Reis Coimbra, Jose A Teixeira, Hoboken: Taylor and Francis. Online resource. Publication Date: 2010.

Practice of Fermentation Technology

Credits: 1

Distribution of learning time: **1 (0/1/2)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

This course introduces the general skills in practice of fermentation. This course introduces how to prepare a fermentation process. This course introduces how to identify and analyze the microbial growth kinetic in a fermentation process.

Textbook:

1. P.F. Stanbury, A. Whitaker and S.J. Hall. 1995. Principles of Fermentation Technology, 2nd edition. Butterworth Heinemann.
2. Ciira Kiiyukia. 2003. Laboratory Manual of Food Microbiology. Unido Project.
2. Trịnh Khánh Sơn. 2017. Bài giảng môn học Thí nghiệm Công nghệ lên men. ĐH Sư phạm kỹ thuật TP.HCM

Graduation Thesis (Food Technology)

Credits: 10

Distribution of learning time: **10 (0/10/20)**

Prerequisites: *None*

Former subjects of condition: *None*

Course Description:

In this course, student must finish a scientific or technical project under the advice of a teachers. Student must use all knowledge and skill to solves the problems of project. Project must be written as a thesis and must be presented to an official evaluation committee.

Textbook:

1. All text books in Food Technology Programme
2. Scientific papers of food technology and related fields

10. Campus Infrastructure

Follow the Ministry of education and training's regulations

11. PROGRAM GUIDE

- Credit hour is calculated as:

1 credit	= 15 lecture hours
	= 30 laboratory hours
	= 45 hours of practice
	= 45 hours of self-study
	= 90 workshop hours.

= 45 hours for project, thesis.

- Graduation thesis: conduct a research project to solve specific problems related to the major.

RECTOR

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