

Responsible Units

Faculty of Science and Technology, Nakhon PathomRajabhat University

Programme Title :Bachelor of Science Program in Food Science and Technology

Name of the Degree

Full Name : Bachelor of Science Program in Food Science and Technology

Abbreviation : B.S. (Food Science and Technology)

Regular Program

Courses required by 138 credits

Courses required by University 30 credits Courses required by Food Science and Technology curriculum 108 credits

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| 1. General Education Courses | 30 credits |
| 2. Specific Requirement Course | 96 credits |
| 3. Cooperative Education Course | 6credits |
| 4. Free Elective Course | 6 credits |

1.General Education Courses(30 credits)

Subject

Credit

1500133

Thai for Communication

3(3-0-6)

Skills in listening, speaking, reading and writing, Thai usage for communication in daily life

1500134

English for Communication

3(3-0-6)

Skills in listening, speaking, reading and writing in daily life, listening for main ideas, answering questions, describing, giving information, expression ideas, reading for main ideas and details, writing sentences and paragraphs

1500135

English at Work

3(3-0-6)

Skills in listening, speaking, reading and writing at work, self and organization introducing, interviewing, telephoning, presenting, documents reading, Job application form writing, Interoffice memo writing, e-mail communicating

1500136

Chinese for Communication

3(3-0-6)

Chinese skills for communication in daily life, greeting and farewell, introducing oneself and others, expressing gratitude and apologizing, food and drink ordering and shopping

1500137 Chinese Conversation at Work 3(3-0-6)

Chinese listening and speaking at work, asking for information, telephoning, making appointments, interviewing, leaving messages and Job application form and resume writing

1500138 Japanese for Communication 1 3(3-0-6)

Japanese characters and sound system, vocabularies, basic Kanji letters, basic sentence structure, daily conversations and basic Japanese communication

1500139 Japanese for Communication 2 3(3-0-6)

Skills in Japanese listening, speaking, reading and writing, Japanese in daily life communication

1500140 Basic Tagalog 3(3-0-6)

Introduction to Tagalog language, alphabets, consonants and vowels, stress and syllables, basic sentence patterns; greetings and daily conversation, talking about oneself, friends, family, daily activities, telling time; vocabularies in contexts, occupation, color, cardinal numbers, clothes, accessories

1500141 Conversation in Tagalog 3(3-0-6)

Effective listening comprehension and speaking skills; small talk, hobbies and daily activities, eating out, getting around, travelling, shopping, tourist conversations, sports, transferring and exchanging of ideas; using the Tagalog language in different situations and contexts; Pilipino cultures and communication strategies

1500142 Basic Malay 3(3-0-6)

Introduction to Malay language, alphabets, consonants and vowels, stress and syllables, basic sentence patterns; greetings and daily conversation, talking about oneself, friends, family, daily activities, telling time; vocabularies in contexts, occupation, color, cardinal numbers, clothes, accessories

1500143 Conversation in Malay 3(3-0-6)

Effective listening comprehension and speaking skills; small talk, hobbies and daily activities, eating out, getting around, travelling, shopping, tourist conversations, sports, transferring and exchanging of ideas; using the Malay language in different situations and contexts; Malaysian/Indonesian cultures and communication strategies

- 1500144 Basic Lao 3(3-0-6)**
Introduction to Lao language, alphabets, consonants, vowels and tones, basic sentence patterns; greetings and daily conversation, talking about oneself, friends, family, daily activities, telling time; vocabularies in contexts, occupation, color, cardinal numbers, clothes, accessories
- 1500145 Conversation in Lao 3(3-0-6)**
Effective listening comprehension and speaking skills; small talk, hobbies and daily activities, eating out, getting around, travelling, shopping, tourist conversations, sports, transferring and exchanging of ideas; using the Lao language in different situations and contexts; Lao cultures and communication strategies
- 1500146 Basic Burmese 3(3-0-6)**
Introduction to Burmese language, alphabets, consonants, vowels and tones, basic sentence patterns; greetings and daily conversation, talking about oneself, friends, family, daily activities, telling time; vocabularies in contexts, occupation, color, cardinal numbers, clothes, accessories
- 1500147 Conversation in Burmese 3(3-0-6)**
Effective listening comprehension and speaking skills; small talk, hobbies and daily activities, eating out, getting around, travelling, shopping, tourist conversations, sports, transferring and exchanging of ideas; using the Burmese language in different situations and contexts; Burmese cultures and communication strategies
- 1500148 Basic Vietnamese 3(3-0-6)**
Introduction to Vietnamese language, alphabets, consonants, vowels and tones, basic sentence patterns; greetings and daily conversation, talking about oneself, friends, family, daily activities, telling time; vocabularies in contexts, occupation, color, cardinal numbers, clothes, accessories
- 1500149 Conversation in Vietnamese 3(3-0-6)**
Effective listening comprehension and speaking skills; small talk, hobbies and daily activities, eating out, getting around, travelling, shopping, tourist conversations, sports, transferring and exchanging of ideas; using the Vietnamese language in different situations and contexts; Vietnamese cultures and communication strategies
- 2000112 Thai Government and Politics 3(3-0-6)**

Basic knowledge of Thai government and politics, analyzing and expressing thoughts on Thai government and politics, crucial events of Thai history, changes of Thai government and politics from Sukhothai era to present in relation to economic, social, cultural dimensions and influence of globalization

2000113 ASEAN Studies 3(3-0-6)

Integration of ASEAN countries based on regionalism, evolution of Association of South East Asian Nations, the ASEAN charter, ASEAN Political Security Community (APSC), ASEAN Economic Community (AEC), ASEAN Socio-Cultural Community (ASCC), fundamental information and roles of ASEAN countries members, ASEAN historical background, ASEAN dialogue partnership and ASEAN citizenship

2000114 Thai Society in Global Context 3(3-0-6)

Evolution of Thai politics, economy, society, and culture, relation between Thai and other countries in different periods from pre-modernism to post-modernism, roles of Thailand in international context, adaptation and cooperation of Thailand and global community

2000115 Human and Environment 3(3-0-6)

Natural resources and environments, ecosystems, biodiversity, food security, natural disaster, environmental crisis, human development process for resources and environmental management for sustainable locality development

2000116 Laws in Daily Life 3(3-0-6)

Basic knowledge of laws used in daily life, fundamental rights and freedom based on constitutional law, rules of public and private laws, introduction to civil and commercial laws, criminal laws, administration of justice, application and integration of laws used in daily life

2500114 Ethics and Life Skills 3(3-0-6)

Concepts of life and ethics, ethical problems in the current society, ethical principles for life happiness, life skills in 21st century, life skills based on the philosophy of sufficiency economy, lifelong learning skills and volunteer mindedness and public consciousness

2500115 Volunteer Mindedness for Local Development 3(3-0-6)

Definitions, importance, notions, ideologies, principles and methods of public consciousness for individual, communal, and local development, roles of individual and non-benefit organizations, case studies and voluntary processes devoting to community

2500116 Aesthetic Appreciation 3(3-0-6)

Definitions and value of aesthetics, visual art, musical art, Thai classical drama, performance art, aesthetic perceptions and appreciation

2500117 Psychology in Daily Life 3(3-0-6)

Importance of psychology for life, components and factors of human behaviors, nature of human development, understanding self and others, effective adjustment, self-development, human relations, teamwork and application of psychology for happiness in life

2500118 Information for Study Skills 3(3-0-6)

Definitions and importance of information technology and information literacy, information resources and services, classification of information resources, strategies and skills in Online Public Access Catalog (OPAC), online databases searching, academic report writing, reference citation and laws and ethics for information use

2500119 Dvaravati Studies 3(3-0-6)

History of Dvaravati kingdom, characteristics of society, economy, politics and government, art and cultural growth, historical traces of Dvaravati found in different regions of Thailand and importance of Dvaravati culture on Nakhon Pathom province

4000124 Thinking and Decision Making 3(3-0-6)

Principles and process of human thinking, development of cognitive attributes and process, creative and systematic thinking, pursuit of scientific knowledge and methodology, logic, data analysis, decision making process, application of the knowledge in daily life

4000125 Sport Science for Health 3(3-0-6)

Definitions and objectives of sport science, principles, categories and advantages of exercises, physical activities exercises, sporting, manners of good players and watchers, physical efficiency supplement, sport habits and first aid for exercising injuries

4000126 Information and Communication Technology 3(3-0-6)

Definitions and components of the computer system and information and communication technology; use of information and communication technology for data retrieval, software application, word processing, spreadsheet, presentation, network

communication, network security system, computer ethics and cyber laws, and computer ergonomics

4000127 Science and Technology Development in the Changing World 3(3-0-6)

Effects of science and technology on global changes, development of community and country, energy and global warming, natural resources, environment, disaster, agriculture, and agricultural industry

4000128	Well-being Promotion	3(3-0-6)
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Importance of physical and emotional health, food, medicines and herbs, personal hygiene, community environment, diseases prevention, life quality development, personal skills, interpersonal skills, principles of holistic health promotion, health fitness, awareness and appreciation of benefits of exercise, physical fitness, health checkup, health insurance system in Thailand

4000129	Recreation for Health	3(3-0-6)
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Definitions, importance and advantages of recreation activities, recreation activities in daily life, leaders of recreation activities, recreation activities for oneself and family

4000130	Health Insurance System in Thailand	3(3-0-6)
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Philosophy, concepts, principles and health insurance system, development of health insurance system of Thailand and other countries, fund management and citizen rights under the National Health Insurance System

4000131	Mathematics in Daily Life	3(3-0-6)
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Basic Mathematics in daily life, proportion, percentage, calculation of progressive rate for electricity and water, electricity and water, interest, installment systems and actuarial science

2. Specific Requirement Course (96 credits)

2.1 กลุ่มวิชาแกน (39 credits)

Subject	Credit
1500117 English for Science 1	3(3-0-6)
ทักษะในการสื่อสารทางวิทยาศาสตร์ ประกอบด้วยกิจกรรมการฝึกจากการนำเนื้อหาหลักทางวิทยาศาสตร์มาใช้ประกอบการพัฒนาทักษะการพูด ด้วยวิธีการสนทนา อธิบาย สาธิต ทำให้ผู้เรียนเกิดทักษะการอ่าน ขณะทำกิจกรรม สามารถเข้าใจศัพท์เฉพาะที่เกี่ยวข้อง	
1500118 English for Science 2	3(3-0-6)

ทักษะในการสื่อสารทางวิทยาศาสตร์ ประกอบด้วยกิจกรรมการเรียนรู้ส่งเสริมให้ผู้เรียนเข้าใจศัพท์เฉพาะทาง การจดบันทึก การบรรยาย การเขียนไดอะแกรม รวมถึงการเขียนจดหมาย จดหมายอิเล็กทรอนิกส์ เพื่อพัฒนาการอ่านหลากหลายรูปแบบ โดยใช้บทความภาษาอังกฤษที่เกี่ยวข้องทางวิทยาศาสตร์

4011305 Physics 1 3(3-0-6)

การวัด ความแม่นยำและความเที่ยงตรงในการวัดหน่วยปริมาณสเกลาร์ และเวกเตอร์ ตำแหน่ง และการเคลื่อนที่ของวัตถุ กฎการเคลื่อนที่ของนิวตัน งาน กำลัง พลังงาน กฎการอนุรักษ์ของพลังงานและโมเมนตัม ความยืดหยุ่นของวัตถุ คลื่นกล ปฏิกิริยาทางความร้อน หลักการเบื้องต้นทาง อุณหพลศาสตร์ การขยายตัว การเปลี่ยนสถานะ และการถ่ายเทความร้อน

4021115 General Chemistry 3(2-2-5)

โครงสร้างอะตอมและตารางธาตุ พันธะเคมี ปริมาณสารสัมพันธ์ สมดุลเคมีและกรด-เบส แก๊สของแข็ง ของเหลว ไฟฟ้าเคมีเบื้องต้น

4022305 Organic Chemistry 3(2-2-5)

คาร์บอนและการเกิดไฮบริดไดเซชัน หมู่ฟังก์ชันของสารอินทรีย์ สารประกอบไฮโดรคาร์บอน สารประกอบอินทรีย์ที่มีไนโตรเจนและออกซิเจนเป็นองค์ประกอบ คาร์โบไฮเดรต ลิพิด โปรตีน

4022501 Biochemistry 3(2-2-5)

เซลล์ กรด-เบสและบัฟเฟอร์ในเซลล์ คาร์โบไฮเดรต โปรตีน ลิพิด เอนไซม์ กรดนิวคลีอิก การย่อยและการดูดซึมอาหาร เมตาบอลิซึมของคาร์โบไฮเดรต โปรตีน ลิพิด

4022605 Analytical Chemistry 3(2-2-5)

กระบวนการในเคมีวิเคราะห์ หน่วยและการวัด ความคลาดเคลื่อนในการวัด สถิติในเคมีวิเคราะห์ การทำมาตรฐาน การวิเคราะห์เชิงน้ำหนัก การวิเคราะห์เชิงปริมาตร การไทเทรตกรด-เบส การไทเทรตแบบรีดอกซ์

4023401 Physical Chemistry 3(2-2-5)

สมบัติของแก๊สและทฤษฎีจลน์ของแก๊ส กฎของอุณหพลศาสตร์ สมดุลของเฟส กฎของเฟส

4031107 Fundamental Biology 3(2-2-5)

Macromolecules, cell, tissues, reproduction, growth and development, organ system, biological classification, origin of life, evolution, inheritance, life and environment, environmental conservation

4032601 Microbiology 3(2-2-5)

รายวิชาที่ต้องสอบผ่านมาก่อน 4031107 ชีววิทยาพื้นฐาน

ความรู้พื้นฐานของจุลชีววิทยา ศึกษาเปรียบเทียบโพรคาริโอตและยูคาริโอต การจำแนกประเภท สัณฐานวิทยา สรีรวิทยา การเติบโต การสืบพันธุ์ การควบคุมจุลินทรีย์ ความสัมพันธ์ของจุลินทรีย์ต่ออาหาร น้ำ ดิน อากาศ การอุตสาหกรรม การสุขภาพ โรคติดต่อและภูมิคุ้มกัน

4091606 Mathematics for Science 3(3-0-6)
 สมการเส้นตรง สัญกรณ์วิทยาศาสตร์ ฟังก์ชันเอ็กซ์โปเนนเชียล ฟังก์ชันลอการิทึม การแก้สมการเอ็กซ์โปเนนเชียลและลอการิทึม การหาอนุพันธ์และปริพันธ์ของฟังก์ชันพีชคณิต การประยุกต์ของอนุพันธ์และปริพันธ์

4113105 Statistics for Research 3(3-0-6)
 ความหมายของสถิติ การวิเคราะห์เปรียบเทียบข้อมูล 2 กลุ่ม ประชากรและการสุ่มตัวอย่าง การทดสอบสมมติฐาน การหาความสัมพันธ์ระหว่างตัวแปร การพยากรณ์ การวิเคราะห์ความแปรปรวนแบบทางเดียวและสองทาง การวิเคราะห์ข้อมูลด้วยโปรแกรมสำเร็จรูป

5075101 Food and Nutrition 3(3-0-6)
 ข้อเสนอแนะการบริโภคอาหาร การย่อยอาหาร หน้าที่ขององค์ประกอบในอาหารที่มีต่อสุขภาพ ปริมาณพลังงานและสารอาหารที่ควรได้รับ อาหารที่มีผลเชิงสุขภาพ ฉลากโภชนาการ และการแพ้อาหาร

2.2 กลุ่มวิชาเฉพาะด้านบังคับ (45 credits)

Subject	Credit
5075102 Food Chemistry 3(2-3-4) รายวิชาที่ต้องเรียนมาก่อน 4022501ชีวเคมี Principal components of food, ie., water carbohydrate protein fat ash flavor food additive vitamins and minerals. The chemical phenomena of food during the processing and storage.	
5075103 Principles of Food Analysis 3(3-0-6) Subject pass before 4022605 Analytical Chemistry Basic principles and quality and quantity standard method of food analysis, Care of food analytical Instruments, chemical analysis of food; moisture content, protein, carbohydrate, fat, ash, vitamins, minerals and pigments.	
5075104 Food Analysis Laboratory 1(0-3-0) Laboratory concerned principles of food analysis.	
5075201 Food Microbiology 3(3-0-6) Isolation and physiological characterization of microorganisms. Factors affecting growth and survival of microorganisms in food. Food spoilage. Control and prevention of food spoilage. Fermented food. Food borne illness. Food legislations and safety. Control of food	

contamination. Control of microorganisms in food using chemical, microbiological and physical methods.

5075202 Food Microbiology Laboratory 1(0-3-0)

Enumeration techniques for microbial cells in food products. Isolation of important microorganism in food: moulds, yeast, bacteria. Detection and determination of coliforms, faecal coliforms and *E.coli* in foods. Physical and microbiological examination in foods. Factors affecting food spoilage. Detection of food spoilage and food borne pathogens. Food fermentation.

5075301 Introduction to Food Science and Technology 3(2-3-4)

Composition of food, Spoilage of food, Principles of preparation and basic cooking, Primary Food Processing Technology.

5075302 Food Processing 1 3(2-3-4)

Subject pass before 5075301 Introduction to Food Science and Technology

Principles and importance of food processing, handle and preparation of raw materials in food industry, postharvest practices, and technology of food processing that are thermal, drying, low temperature, irradiation, food fermentation, food additive and new technologies for food processing.

5075303 Food Processing 2 3(2-3-4)

Subject passed before 5075302 Food Processing 1

Technology of food commodities, processing techniques associated with their transformation into food products, waste utilization and by-product.

5075304 Planning and Management of Food Industry 3(3-0-6)

Principle of food production planning and management, quality management supply chain and logistics in food industry, demand forecasting, capacity planning, material requirement planning, inventory management, cost control and productivity improvement, plant layout, safety and psychology in food industry

5075401 Fundamental Food Engineering 3(2-3-4)

Theory and principle of food engineering, dimension and unit, thermodynamics, mass and energy balance, flow characteristic of fluid, rheology properties of food. Heat transfer and heat exchanger, process time calculation for food thermal process and equipment

5075402 Unit Operation for Food Engineering 3(2-3-4)

Subject passed before 5075401 Fundamental Food Engineering

Theory and principle of food engineering, dimension and unit, thermodynamics, mass and energy balance, flow characteristic of fluid, rheology properties of food. Heat transfer and heat exchanger, process time calculation for food thermal process and equipment.

5075501 Food Laws and Food Sanitation 3(3-0-6)

Thai and international food laws and standards involving production labeling and products, government agency responsibilities, principles of sanitation in food processing plant and water and waste water treatment.

5075502 Food Quality Control and Assurance 3(2-3-4)

Principle of quality control and quality assurance quality measurement of physical, chemical, sampling of food, inspection and statistical process of specification of raw materials process and finished products, management of food quality assurance system, administration of quality organization, quality system.

5075504 Quality System and Food Safety Management 3(3-0-6)

Basic of food safety, problem of food safety, Risk analysis of food safety , food quality assurance management, diagram of quality control, principle of quality organization, quality system, selection of quality system, standard of quality system, organization of quality management

5075601 Seminar in Food Science and Technology 1(0-2-1)

Search and selection then compose for analysis and order to prepare a presentation. Discuss topics of interest in food science and technology.

5075602 Introduction to Research and Experimental Design in Food Science and Technology 3(2-3-4)

Meaning and type of research. The principle of experimental planning and experimental design, sampling for sample, to collect data, statistical data analysis and translation results, a computer program used for statistical analysis of data.

5075603 Special Problems in Food Science and Technology 3(0-6-3)

Study in research problems and hypothesis, experimental design, experimental methodology and research in food sciences and technology or problem relevants food and food products, discussion and conclusion, presentation and report under advisor.

2.3 วิชาเฉพาะด้านเลือก (12 credits)

Subject	Credit
5075105 Food Additives Type of food additives for food industry, classification of additive on toxicology principle, how to use and functional properties, effect of food additive properties on chemical, physical biological, storage of food and consumers. Law and regulation of food additives.	3(3-0-6)
5075119 Seafood Nutrition Nutritional value, biochemical changes that affect the composition of seafood consumed. Food poisoning and safe to consume seafood.	3(3-0-6)
5075203 Fermentation Industry Fermentation process, fermentation kinetics, aeration and agitation, instruments and their control, industrial products from microorganisms such as penicillin, fermented soy sauce, wine, beer, enzyme, vinegar, citric acid, amino acids, vitamins and food safety.	3(2-3-4)
5075305 Cereal and Cereal Product Technology Type of cereals, structure and chemical composition of cereal grains, storage, quality changes, nutritional attributes of cereals and products, processing and properties of cereal products.	3(2-3-4)
5075306 Bakery Technology Raw materials and tools used in bakery products production, Production technology of bakery products, Product storage.	3(2-3-4)
5075307 Milk Product Technology สมบัติของน้ำนม การใช้เทคโนโลยีตรวจสอบคุณภาพของนม การแปรรูปผลิตภัณฑ์นม และการเก็บรักษา	3(2-3-4)
5075308 Meat Product Technology Muscle component the changing involved carcass to meat after slaughtering meat quality meat processing meat and meat product spoilage meat and meat products storage	3(2-3-4)
5075309 Food Packaging Principle of food packaging, type of material, physical and chemical properties of food packaging, equipment and principal of food packaging, nutrition labeling, design and innovation of packaging.	3(2-3-4)

- 5075311 Fruit and Vegetable Technology 3(2-3-4)**
 Structure and composition of fruit and vegetable, physiology change, pre- and postharvest horticultural produce, processing methods and storage
- 5075312 Fishery Product Technology 3(2-3-4)**
 Type of fishery for consumption. Chemical composition, physical and biological properties of fishery. Causes of spoilage and quality changes in fish. Processing, packaging, storage, transportation and quality control of fish and fishery products.
- 5075313 Food for Health 3(3-0-6)**
 Definition and principles of healthy food processing and quality of healthy food category of healthy food supplement food aging food and impact of consuming healthy food.
- 5075315 Candy Chocolate and Snack Technology 3(2-3-4)**
 Raw materials and properties used in the manufacture of candy, chocolate and snacks, Production technology of candy, chocolate and snack products, Product storage.
- 5075316 Organic Food 3(3-0-6)**
 Definition and principles of organic plant and livestock production history and standard regulations Marketing trending the relation between organic food and environment organic food processing organic food quality and organizations.
- 5075317 Fats and Oil Technology 3(3-0-6)**
 Type of fats and oil, structure, property, transition of physical and chemical composition processing products and inspections.
- 5075318 Utilization of By-Product from Food Industry 3(2-3-4)**
 Resources and composition of the waste from the food industry. Waste management and utilization of waste from the food industry.
- 5075503 Food Product Development and Sensory Evaluation 3(2-3-4)**
 Principle and product development method, Principle and sensory evaluation method, Shelf life testing of the product.
- 5075604 Trends and Special Topics in Food Science and Technology 3(3-0-6)**
 แนวโน้ม ความก้าวหน้า และติดตามการเปลี่ยนแปลงประเด็นร้อนทางด้านวิทยาศาสตร์และเทคโนโลยีการอาหาร

3. Cooperative Education Course (6 credits)

Subject		Credit
5075701	Internship in Food Science and Technology	6(540)
Field experience in production and quality control in food factory and relevant organization. Study on food factory production, business and food quality assurance, sanitation and organization management in term of standard system and report.		
5075702	Co-operative Education	6(540)
On the job training as a temporary employee in the food industry according to the assigned project including report and presentation. The evaluation will be conducted by academic advisor as well as job supervisor.		

4. Free Elective Course (6 credits)

ให้เลือกเรียนรายวิชาใด ๆ ในหลักสูตรมหาวิทยาลัยราชภัฏนครปฐมโดยไม่ซ้ำกับรายวิชาที่เคยเรียนมาแล้ว และต้องไม่เป็นรายวิชาที่กำหนดให้เรียนโดยไม่นับหน่วยกิตรวมในเกณฑ์การสำเร็จการศึกษาของหลักสูตรนี้