

Bachelor of Science Program in Food Science and Technology (International Program)

1. Code and Program Title

In Thai หลักสูตรวิทยาศาสตรบัณฑิต สาขาวิชาวิทยาศาสตร์และเทคโนโลยีการอาหาร
(หลักสูตรนานาชาติ)

In English Bachelor of Science Program in Food Science and Technology
(International Program)

2. Title of Degree and Field of Study

In Thai Full Title วิทยาศาสตรบัณฑิต (วิทยาศาสตร์และเทคโนโลยีการอาหาร)
Abbreviation วท.บ. (วิทยาศาสตร์และเทคโนโลยีการอาหาร)

In English Full Title Bachelor of Science (Food Science and Technology)
Abbreviation B.Sc. (Food Science and Technology)

3. Major Subject (If Applicable)

Food Science Concentration
Culinary Science Concentration

4. Career Opportunities after Graduation

- 1) Graduates can work in quality control or quality Assurance positions in food manufacturing and related markets.
- 2) Graduates can work in Food Product Research and Development departments.
- 3) Graduates can work in trading and services departments in private and governmental sectors.
- 4) Graduates will be demanded in food manufacturing and related markets.
- 5) Graduates can work in customer relations for food companies
- 6) Graduates can work in the field of food science and technology in academic organizations either in Thailand or outside Thailand.

5. Total Credits Required

No less than 181 credits

Note: If students are placed into the 'EC Track' for their General Education requirement in English Communication, they must take 4 more credits of General Education in English Communication.

6. Program Structure

1) Foundation Courses	Non-credit
2) General Education Courses	38 credits
- English Communication	12 credits
- Natural Sciences	8 credits
- Humanities and Foreign Languages	8 credits
- Social Sciences	8 credits

- Physical Education 2 credits

3) Major Courses

Food Science Concentration 135 credits

- Core Courses 52 credits

- Required Major Courses 71 credits

- Elective Major Courses 12 credits

Or,

Culinary Science Concentration 135 credits

- Core Courses 52 credits

- Required Major Courses 79 credits

- Elective Major Courses 4 credits

4) Free Electives 8 credits

Foundation Courses

ICID 100	Freshman Seminar	0
ICME 100	English Resource Skills	0
ICMA 100	Foundation Mathematics	0

Note I: All students must take ICID 100 Freshman Seminar, a non-credit course.

Note II: Students whose English placement is below ICGC 101 Academic Writing and Research I are required to take ICME 100 English Resource Skills and pass the course with the grade of "S" before moving to ICGC 101 Academic Writing and Research I.

Note III: Students whose Mathematics placement is below ICMA 106 Calculus I or ICMA 151 Statistics for Science I are required to take ICMA 100 Foundation Mathematics and pass the course with the grade of "S" before moving to ICMA 106 Calculus I or ICMA 151 Statistics for Science I.

English Communication

ICGC 101	Academic Writing and Research I	4
ICGC 102	Academic Writing and Research II	4
ICGC 103	Public Speaking	4
ICGC 111	Academic Writing and Research I (Advanced)	4
ICGC 112	Academic Writing and Research II (Advanced)	4
ICGC 201	Global Realities	4
ICGC 202	Literary Analysis	4
ICGC 203	Creative Writing	4
ICGC 204	Advanced Oral Communication	4
ICGC 205	Linguistics	4
ICGC 206	Literature Into Film	4
ICGC 207	Diverse English Speaking Cultures	4
ICGC 208	Language and Culture	4
ICGC 209	The Story of English	4

ICGC 210	First and Second Language Acquisition	4
ICGC 211	Topics in Comparative Literature A: Poetry	4
ICGC 212	Topics in Comparative Literature B: The Short Story and the Novel	4
ICGC 213	Topics in Comparative Literature C: Drama	4

Note I: Students who are qualified to take ICGC 111 and 112 (Academic Writing and Research I and II (Advanced)) may choose additional English Communication course to meet the minimum requirement of 12 credits.

Note II: Students who are required to take ICGC 101, 102, and 103 (Academic Writing and Research I and II, and Public speaking) will have to choose a fourth course in English Communication. Thus, total credits for English Communication will be 16.

Natural Sciences

Scientific and Environmental Literacy

ICGN 101	Decision Mathematics	4
ICGN 102	Essential Mathematics	4
ICGN 103	Essential Statistics	4
ICGN 104	Mathematics and Its Contemporary Applications	4
ICGN 105	Ecology, Ecosystems and Socio-Economics in Southeast Asia	4
ICGN 106	Climate Change and Human Society	4
ICGN 107	The Chemistry of Everyday Life	4
ICGN 108	Essentials of Culinary Science for Food Business	4
ICGN 109	Food for Health	4
ICGN 110	Maker Workshop	
ICGN 111	Physics for CEO	4
ICGN 112	Stargazer	4
ICGN 113	Plants, People and Poisons	4
ICGN 114	The Scientific Approach and Society	4
ICGN 115	Human Evolution, Diversity and Health	4

ICT and Digital Literacy

ICGN 116	Understanding and Visualizing Data	4
ICGN 117	Technology behind E-Business and Digital Strategies	4
ICGN 118	Everyday Connectivity	4
ICGN 119	Computer Essentials	4

Humanities

Logical and Ethical Literacy

ICGH 101	Biotechnology: from Science to Business	4
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ICGH 102	Famous Arguments and Thought Experiments in Philosophy	4
ICGH 103	Logic, Analysis and Critical Thinking: Good and Bad Arguments	4
ICGH 104	Moral Reasoning: How can we know what is good?	4
ICGH 105	Technology, Philosophy and Human Kind: Where Are We Now?!	4
ICGH 106	The Greeks: Crucible of Civilization	4

Arts and Media Literacy

ICGH 107	Contemporary Art and Visual Culture	4
ICGH 108	Creative Drawing Expression	4
ICGH 109	Creative Thinking Through Art and Design	4
ICGH 110	Drawing as Visual Analysis	4
ICGH 111	Media Literacy: Skills for 21st Century Learning	4
ICGH 112	Photography	4
ICGH 113	Moving Pictures: A History of Film	4
ICGH 114	The Sound of Music: Form, Emotion, and Meaning	4

Foreign Languages

German

ICGL 101	Elementary German I	4
ICGL 102	Elementary German II	4
ICGL 103	Elementary German III	4

Japanese

ICGL 111	Elementary Japanese I	4
ICGL 112	Elementary Japanese II	4
ICGL 113	Elementary Japanese III	4

French

ICGL 121	Elementary French I	4
ICGL 122	Elementary French II	4
ICGL 123	Elementary French III	4

Chinese

ICGL 131	Elementary Chinese I	4
ICGL 132	Elementary Chinese II	4
ICGL 133	Elementary Chinese III	4

Spanish

ICGL 141	Elementary Spanish I	4
ICGL 142	Elementary Spanish II	4
ICGL 143	Elementary Spanish III	4

Thai

ICGL 160	Introduction to Thai Language and Culture	4
ICGL 161	Elementary Thai I	4
ICGL 162	Elementary Thai II	4
ICGL 163	Elementary Thai III	4

Social Sciences

Financial, Economic Scientific and Environmental Literacy

ICGS 101	Accounting for Young Entrepreneurs	4
ICGS 102	Business Sustainability and the Global Climate Change	4
ICGS 103	Economics in Modern Business	4
ICGS 104	Essentials of Entrepreneurship	4
ICGS 105	Personal Financial Management	4
ICGS 106	Fashion and Society	4
ICGS 107	MICE 101	4
ICGS 108	Money Matters	4

Global and Multicultural Literacy

ICGS 109	American History, Film and Modern Life	4
ICGS 110	Development and Conflicts	4
ICGS 111	Exploring Religions	4
ICGS 112	Geography of Human Activities	4
ICGS 113	Perspectives on the Thai Past	4
ICGS 114	Power, Money and Behavior of Powerful States	4
ICGS 115	Sociology in the Modern World	4
ICGS 116	Power and Politics	4
ICGS 117	Overcoming Stereotypes, Prejudice and Discrimination	4
ICGS 118	Skills in Dealing with People Across Cultures	4
ICGS 119	World Politics	4
ICGS 120	Global Awareness	4

Psychological Literacy

ICGS 121	Abnormal Colleagues: how do I make this work?	4
ICGS 122	Propaganda, Nudge Theory and Marketing: How to resist?	4

Physical Education

ICGP 101	American Flag Football	1
ICGP 102	Badminton	1
ICGP 103	Basketball	1
ICGP 104	Body Fitness	
ICGP 105	Cycling	
ICGP 106	Discover Dance	
ICGP 107	Golf	1
ICGP 108	Mind and Body	1
ICGP 109	Selected Topics in Sports	1
ICGP 110	Self Defense (Striking)	1
ICGP 111	Self Defense (Grappling)	1
ICGP 112	Soccer	1
ICGP 113	Social Dance	1
ICGP 114	Swimming	1
ICGP 115	Tennis	1
ICGP 116	Volleyball	1

Major Courses

135 credits

Core Courses

52 credits

ICBI 101	Biology	4
ICCH 210	General Chemistry I	4
ICCH 211	General Chemistry II	4
ICCH 221	Organic Chemistry I	4
ICCH 224	Integrated Laboratory Techniques in Chemistry I	2
ICCH 311	Analytical Chemistry	4
ICFS 214	Elements of Physical Chemistry and Biochemistry For Food Science	4
ICFS 215	Human Nutrition	4
ICFS 231	General Microbiology	4
ICMA 106	Calculus I	4
ICMA 213	Calculus II	4
ICMA 252	Biological Statistics Laboratory	2
ICPY 101	Physics I	4

Food Science Concentration

Major Required Courses

71 credits

ICFS 111	Introduction to Food Science and Technology	4
ICFS 314	Food Analysis	4

ICFS 317	Food Chemistry	4
ICFS 318	Food Ingredients Functionality	2
ICFS 319	The Chemistry of Food and Quality	2
ICFS 333	Food Microbiology	4
ICFS 334	Food Microbiology Laboratory	2
ICFS 341	Food Processing	4
ICFS 342	Food Storage and Shelflife Extension	4
ICFS 343	Integrated Approach to Smart and Green Agro-Industry	4
ICFS 351	Food Engineering Principles	2
ICFS 352	Unit Operations in Food Engineering	3
ICFS 361	Principles of Quality Assurance in Food Processing	4
ICFS 362	Food Safety and Sanitation	4
ICFS 363	Food Law and Standard of Commercial Food Products	4
ICFS 411	Food Product Development	4
ICFS 451	Internship in Food Science and Technology	4
ICFS 491	Seminar in Food Science and Technology	2
ICFS 495	Senior Project in Food Science and Technology I	2
ICFS 496	Senior Project in Food Science and Technology II	4
ICSC 302	Scientific Research and Presentations	4

Note: Students may choose one of the following two options.

1. Research Track: Internship in Food Science and Technology and Senior Project in Food Science and Technology I and II (ICFS 495 and ICFS 496) for a total 10 credits
2. Cooperative Education Track: Cooperative Education (ICFS 461 and ICFS 462) for a total 10 credits

ICFS 461	Cooperative Education Preparation	2
ICFS 462	Cooperative Education	8

Major Elective Courses

12 credits

ICFS 323	Foods for Sports and Exercises	4
ICFS 374	Experimental design in Food Product Development	2
ICFS 375	Integrated Sensory and Consumer Sciences for Product Development	4
ICFS 376	Science of Thai Culinary Arts	4
ICFS 413	Marketing of Food Product and Services	2
ICFS 414	Operations Management in Food Business	2
ICFS 418	Fruits and Vegetables Technology	4
ICFS 419	Meat, Poultry and Marine Product Technology	4
ICFS 422	Dairy Products Technology	4
ICFS 423	Beverage Technology	4

ICFS 424	Fat and Oil Technology	4
ICFS 426	Bakery Product Technology	4
ICFS 427	Confectionary and Chocolate Technology	4
ICFS 432	Sensory Evaluation of Food Products	4
ICFS 436	Food Fermentation Technology	4
ICFS 437	Application of Modern Biotechnology to Food Products	4
ICFS 438	Cereal and Starch Technology	4
ICFS 452	Food Packaging	4
ICFS 463	Field Trip	2
ICFS 471	Trends and Novel Techniques of World Foods and Cuisines	4

Culinary Science Concentration

Major Required Courses		79	credits
ICCS 161	Introduction to Data Science	4	
ICFS 111	Introduction to Food Science and Technology	4	
ICFS 171	Discovering Culinary Techniques	4	
ICFS 172	World Cuisines	4	
ICFS 314	Food Analysis	4	
ICFS 317	Food Chemistry	4	
ICFS 318	Food Ingredients Functionality	2	
ICFS 333	Food Microbiology	4	
ICFS 334	Food Microbiology Laboratory	2	
ICFS 341	Food Processing	4	
ICFS 342	Food Storage and Shelf-life Extension	4	
ICFS 343	Integrated Approach to Smart and Green Agro-Industry	4	
ICFS 351	Food Engineering Principles	2	
ICFS 352	Unit operations in Food Engineering	3	
ICFS 361	Principles of Quality Assurance in Food Processing	4	
ICFS 363	Food Law and Standard of Commercial Food Products	4	
ICFS 373	Food Safety for Food Service Industry	2	
ICFS 374	Experimental Design in Food Product Development	2	
ICFS 375	Integrated Sensory and Consumer Sciences for Product Development	4	
ICFS 413	Marketing of Food Product and Services	2	
ICFS 414	Operations Management in Food Business	2	
ICFS 432	Sensory Evaluation of Food Products	4	
ICFS 451	Internship in Food Science and Technology	4	
ICFS 489	Culinary Product Development Project	2	

Major Elective Courses**4 credits**

ICFS 323	Foods for Sports and Exercises	4
ICFS 376	Science of Thai Culinary Arts	4
ICFS 418	Fruits and Vegetables Technology	4
ICFS 419	Meat, Poultry and Marine Product Technology	4
ICFS 422	Dairy Products Technology	4
ICFS 423	Beverage Technology	4
ICFS 424	Fat and Oil Technology	4
ICFS 426	Bakery Product Technology	4
ICFS 427	Confectionary and Chocolate Technology	4
ICFS 436	Food Fermentation Technology	4
ICFS 437	Application of Modern Biotechnology to Food Products	4
ICFS 438	Cereal and Starch Technology	4
ICFS 452	Food Packaging	4
ICFS 453	Internship in Culinary Science	4
ICFS 463	Field Trip	2
ICFS 471	Trends and Novel Techniques of World Foods and Cuisines	4

Free Electives no less than**8 Credits**

Food Science students can take any course offered by Mahidol University as a free elective, except the following

- ICGN 108 Essentials of Culinary Science for Food Business 4 (4-0-8)
- ICGN 109 Food for Health 4 (4-0-8)

Mahidol University
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