



**FACULTY OF
AGRICULTURE,
NATURAL RESOURCES
AND ENVIRONMENT**



FACULTY OF AGRICULTURE, NATURAL RESOURCES AND ENVIRONMENT

FANRE was originally established in October 1993 to serve the lower northern region of Thailand in which the majority of the population is engaged in agriculture and involved in agricultural industries. FANRE consists of three departments:

1. Department of Agricultural Science
2. Department of Agro-Industry
3. Department of Natural Resources and Environment.

We have continuously produced graduates who possess both academic and practical experiences in these three fields of expertise. To move toward and to become one of the leading organizations related to those three fields of expertise in Thailand, development of postgraduate curricula for international students will strengthen teaching and learning as well as enhance the quality of the program. We are proud of our strong graduate programs both at master and doctoral levels. Our good reputation is confirmed through high quality technical presentations in international conferences, scientific conventions, and both national and international publications.

Currently, FANRE has an academic staff with a broad array of specialization. About 90% of the faculty hold doctoral degrees from countries in North America and Europe, and from universities in Australia, Japan, and Thailand.

Master of Science Program in Agricultural Biotechnology

Research Focus

- Advanced Gene Technology
- DNA Marker Technology
- Recombinant DNA Technology
- Industrial Fermentation Process
- Metabolic Engineering

Structure of the Program

1. Credit Requirements *

Requirements	Option 1.1	Option 1.2
Coursework	-	24
- Core Courses	-	9
- Electives	-	15
Required Non-credit Courses	5	5
Thesis	36	12
Total	36	36

* Minimum credits required

2. Core Courses

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Molecular Genetics	-	-	110531	3
Aspects of Biotechnology	-	-	110551	3
Advanced Gene Technology	-	-	110541	3
Total	-	-	3	9

3. Electives

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Selected Topics in Agricultural Biotechnology	-	-	110503	3
Cell Structure and Function	-	-	110521	3
Molecular Systematics and Evolution	-	-	110532	3
Applications of Molecular Markers	-	-	110542	3
Enzyme Technology	-	-	110561	3
Applications of Polysaccharides in Industry	-	-	110562	3
Bioprocess Engineering	-	-	110571	3
Bioseparation Process	-	-	110572	3
Industrial Fermentation Process	-	-	110573	3
Biotechnology Quality and Safety Management	-	-	110581	3
Total	-	-	≥5	≥15

4. Required Non-credit Courses

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Agricultural Biotechnology Seminar 1	110501	1	110501	1
Agricultural Biotechnology Seminar 2	110502	1	110502	1
Research Methodology in Science and Technology	110511	3	110511	3
Total	3	5	3	5

5. Thesis Credit Requirements

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Thesis 1, Option 1.1	110591	9	-	-
Thesis 2, Option 1.1	110592	9	-	-
Thesis 3, Option 1.1	110593	9	-	-
Thesis 4, Option 1.1	110594	9	-	-
Thesis 1, Option 1.2	-	-	110595	3
Thesis 2, Option 1.2	-	-	110596	3
Thesis 3, Option 1.2	-	-	110597	6
Total	4	36	3	12

Master of Science Program in Agricultural Science

Research Focus

- Advanced Plant Breeding
- Soil Resources and Agricultural Environment Management
- Tropical Animal Production
- Energy Crops and Industrial Crops
- Postharvest Physiology and Technology
- Plant Disease Management
- Insect Pest Management
- Technology for Biofertilizer Production

Structure of the Program

1. Credit Requirements *

Requirements	Option 1.1	Option 1.2
Coursework	-	24
- Core Courses	-	-
- Electives	-	24
Required Non-credit Courses	6	6
Thesis	36	12
Total	36	36

* Minimum credits required

2. Electives

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
General Subject				
Quality Assurance Systems for Agricultural Products	-	-	107500	3
Ecological Agriculture and Natural Resources	-	-	107501	3
Advanced Technology in Modern Agriculture	-	-	107502	3
Agro-Ecology	-	-	107503	3
Experimental Designs in Agriculture	-	-	107504	3
Plant Science				
Crop Production under Controlled Environment	-	-	107510	3
Selected Topics in Plant Science	-	-	107511	3
Advanced Crop Physiology	-	-	107512	3
Advanced Plant Breeding	-	-	107513	3
Advanced Physiology of Fruit Crops	-	-	107514	3
Plant Molecular Biology	-	-	107515	3
Physiology of Flowering	-	-	107516	3
Stress Physiology of Crops	-	-	107517	3
Entomology				
Insect Physiology and Biochemistry	-	-	107520	3
Biological Control of Insect Pests and Weeds	-	-	107521	3
Insect Molecular Genetics	-	-	107522	3
Insecticides	-	-	107523	3
Advanced Insect Ecology	-	-	107524	3
Insect Morphology and Classification	-	-	107525	3
Environmental Entomology	-	-	107526	3
Insect Behavior and Evolution	-	-	107527	3
Integrated Pest Management	-	-	107528	3
Insect Pollinator Management	-	-	107529	3
Soil Resources and Agricultural Environment Management				
Advanced Soil, Plant and Fertilizer Analysis	-	-	107540	3
Advanced Soil Fertility	-	-	107541	3

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Soil and Water Pollution	-	-	107542	3
Soil Microbial Ecology	-	-	107543	3
Advanced Fertilizer Technology	-	-	107544	3
Soil and Land Resource Assessment	-	-	107545	3
Soil, Water and Plant Relationships	-	-	107546	3
Remote Sensing for Agriculture	-	-	107547	3
Geographic Information System for Agriculture	-	-	107548	3
Integrated Management of Soil Resources and Agricultural Environment	-	-	107549	3
Agricultural Development				
Strategic Agriculture Management on Production and Marketing	-	-	107550	3
Selected Topics in Agricultural Development	-	-	107551	3
Agricultural Organization Management and Policy Planning	-	-	107552	3
Rapid Rural Appraisal and Rural Development	-	-	107553	3
Agricultural Information System	-	-	107554	3
Socio-Economic Aspects in Agriculture	-	-	107555	3
Development of Agriculture and Agricultural Society	-	-	107556	3
Tropical Animal Production				
Biotechnology in Animal Production	-	-	107560	3
Selected Topics in Tropical Animal Production	-	-	107561	3
Tropical Animal Feed Resources	-	-	107562	3
Techniques in Animal Nutrition Research	-	-	107563	3
Advanced Meat Science and Technology	-	-	107564	3
Advanced Monogastric Animal Nutrition	-	-	107565	3
Advanced Ruminant Nutrition	-	-	107566	3
Advanced Feed Technology	-	-	107567	3
Domestic Animal Metabolism	-	-	107568	3
Environmental and Animal Waste Management	-	-	107569	3
Field of Study: Energy Crops and Industrial Crops				
Biomass and World Environment	-	-	107570	3

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Principles of Energy Crop and Industrial Crop Production	-	-	107571	3
Energy Conversion from Energy Crops and Industrial Crops	-	-	107572	3
Postharvest Handling of Energy Crops and Industrial Crops	-	-	107573	3
Industrialization and Marketing System of Energy Crops	-	-	107574	3
Field of Study: Postharvest Technology				
Selected Topics in Postharvest Technology	-	-	107580	3
Advanced Postharvest Physiology of Agricultural Produces	-	-	107581	3
Postharvest Handling System of Cereals and Grains	-	-	107582	3
Postharvest Insect Pest of Agricultural Products	-	-	107583	3
Postharvest Pathology of Agricultural Products	-	-	107584	3
Research Techniques in Postharvest Technology	-	-	107585	3
Packaging Technology	-	-	107586	3
Minimal Processing of Horticultural Produce	-	-	107587	3
Total	-	-	≥8	≥24

3. Required Non-credit Courses

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Seminar 1	107507	1	107507	1
Seminar 2	107508	1	107508	1
Seminar 3	107509	1	107509	1
Research Methodology in Science and Technology	107591	3	107591	3
Total	4	6	4	6

4. Thesis Credit Requirements

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Thesis 1, Option 1.1	107592	9	-	-
Thesis 2, Option 1.1	107593	9	-	-
Thesis 3, Option 1.1	107594	9	-	-
Thesis 4, Option 1.1	107595	9	-	-
Thesis 1, Option 1.2	-	-	107596	3
Thesis 2, Option 1.2	-	-	107597	3
Thesis 3, Option 1.2	-	-	107599	6
Total	4	36	3	12

Master of Science Program in Environmental Science

Research Focus

- Environmental Pollution and Control
- Ecology and Conservation
- Health Impact Assessment
- Natural Resources and Environmental Management

Structure of the Program

1. Credit Requirements *

Requirements	Option 1.1	Option 1.2
Coursework	-	24
- Core Courses	-	12
- Electives	-	12
Required Non-credit Courses	6	6
Thesis	36	12
Total	36	36

* Minimum credits required

2. Core Courses

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Applied Environmental Science	-	-	105511	3
Advanced Environmental Impact Assessment	-	-	105512	3
Integrated Natural Resources and Environmental Management	-	-	105513	3
Environmental Ecology	-	-	105514	3
Total	-	-	4	12

3. Electives

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Environmental Pollution and Control				
Fate and Transport of Contaminants in the Environment	-	-	105520	3
Air Pollution and Control	-	-	105521	3
Wastewater and Treatment Technology	-	-	105522	3
Soil Pollution and Management	-	-	105523	3
Agricultural Pollution and Management	-	-	105524	3
Hazardous Waste and Management	-	-	105525	3
Solid Waste and Management	-	-	105526	3
Clean Technology	-	-	105527	3
Wastewater Microbiology	-	-	105528	3
Treatment Wetland	-	-	105529	3
Ecology and Conservation				
Conservation and Management of Soil Water and Forest Resources	-	-	105540	3
Conservation and Management of Biodiversity Resources	-	-	105541	3
Forest Resource Management	-	-	105542	3
Aquatic Ecology	-	-	105543	3
Tropical Ecology	-	-	105544	3
Water Resource Management	-	-	105545	3
Global Climate Change Ecology	-	-	105546	3
Ecotourism Management	-	-	105547	3
Integrated Watershed Management	-	-	105548	3
Health Impact Assessment				
Health Risk Assessment	-	-	105551	3
Health Impact Assessment	-	-	105552	3
Environmental Toxicology	-	-	105553	3
Health Risk Management	-	-	105554	3
Occupational Health	-	-	105555	3
Exposure Assessment	-	-	105556	3

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Natural Resources and Environmental Management				
Natural Resources and Environmental Economy	-	-	105561	3
Application of Geo-Informatics for Natural Resources and Environment	-	-	105562	3
Remote Sensing for Natural Resources and Environment	-	-	105563	3
Urban Environmental Management	-	-	105564	3
Environmental Laws and Policy	-	-	105565	3
Others				
Selected Topics in Environmental Science	-	-	105583	3
Total	-	-	≥4	≥12

4. Required Non-credit Courses

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Seminar 1	105581	1	105581	1
Seminar 2	105582	1	105582	1
Research Methodology in Science and Technology	105598	3	105598	3
Learning Skill for Graduate Studies	105599	1	105599	1
Total	4	6	4	6

5. Thesis Credit Requirements

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Thesis 1, Option 1.1	105591	9	-	-
Thesis 2, Option 1.1	105592	9	-	-
Thesis 3, Option 1.1	105593	9	-	-
Thesis 4, Option 1.1	105594	9	-	-
Thesis 1, Option 1.2	-	-	105595	3
Thesis 2, Option 1.2	-	-	105596	3
Thesis 3, Option 1.2	-	-	105597	6
Total	4	36	3	12

Master of Science Program in Food Science and Technology

Research Focus

- Food Chemistry and Physico-Chemistry
- Product Development and Health Food
- Food Processing and Engineering
- Food Safety

Structure of the Program

1. Credit Requirements *

Requirements	Option 1.1	Option 1.2
Coursework	-	24
- Core Courses	-	3
- Electives	-	21
Required Non-credit Courses	5	5
Thesis	36	12
Total	36	36

* Minimum credits required

2. Core Course

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Advanced Analysis of Food	-	-	108521	3
Total	-	-	1	3

3. Electives

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Food Chemistry and Physico-Chemistry				
Physico-Chemical Properties of Foods for Product and Process Development	-	-	108525	3
Advanced Food Chemistry	-	-	108531	3
Food Carbohydrates	-	-	108532	3
Enzyme and its Application in Food Industry	-	-	108533	3
Food Flavor Chemistry	-	-	108536	3
Food Lipids	-	-	108538	3
Food Proteins	-	-	108539	3
Food Polymer and Its Application	-	-	108573	3
Product Development and Health Food				
Advanced Sensory Techniques	-	-	108523	3
Shelf Life Evaluation of Food and Agro-Industrial Product	-	-	108526	3
Plant Secondary Metabolites	-	-	108535	3
Food Additives and Its Applications	-	-	108537	3
Advanced Food Packaging	-	-	108551	3
Advanced Food Product Development	-	-	108552	3
Health Food and Assessment	-	-	108571	3
Bioactive Substances in Food	-	-	108572	3
Food Processing and Engineering				
Advanced Food Technology	-	-	108511	3
Food Drying Technology	-	-	108512	3
Minimally Processed Food	-	-	108513	3
Advanced Science for Meat Processing	-	-	108514	3
Advanced Cereal Science and Technology	-	-	108534	3
Fermentation Technology	-	-	108562	3
Food Safety				
Food Safety Management System	-	-	108524	3
Toxicants in Food	-	-	108527	3

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Risk Assessment in Food Industry	-	-	108528	3
Quality Management System for Agro Industry	-	-	108529	3
Advanced Food Microbiology	-	-	108561	3
Modeling of Microorganisms in Food	-	-	108563	3
Others				
Selected Topics in Food Science and Technology	-	-	108583	3
Total	-	-	≥7	≥21

4. Required Non-credit Courses

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Research Methodology in Science and Technology	108522	3	108522	3
Seminar 1	108581	1	108581	1
Seminar 2	108582	1	108582	1
Total	3	5	3	5

5. Thesis Credit Requirements

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Thesis 1, Option 1.1	108591	9	-	-
Thesis 2, Option 1.1	108592	9	-	-
Thesis 3, Option 1.1	108593	9	-	-
Thesis 4, Option 1.1	108594	9	-	-
Thesis 1, Option 1.2	-	-	108595	3
Thesis 2, Option 1.2	-	-	108596	3
Thesis 3, Option 1.2	-	-	108597	6
Total	4	36	3	12

Master of Science Program in Geographic Information Science

Research Focus

- Map and Visualization
- Spatial Analysis
- Geographic Information and Database Management
- GIS and Globalization

Structure of the Program

1. Credit Requirements *

Requirements	Option 1.1	Option 1.2
Coursework	-	24
- Core Courses	-	9
- Electives	-	15
Required Non-credit Courses	4	4
Thesis	36	12
Total	36	36

* Minimum credits required

2. Core Courses

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Map and Visualization	-	-	104541	3
Spatial Analysis	-	-	104542	3
Geographic Information and Database Management	-	-	104543	3
Total	-	-	3	9

3. Electives

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Advanced Remote Sensing	-	-	104551	3
Digital Image Analysis	-	-	104552	3
Internet and Mobile Mapping	-	-	104553	3
Spatial Modeling	-	-	104554	3
Spatial Decision Support Systems	-	-	104555	3
Special Topic in Geographic Information Science	-	-	104556	3
Landscape Evolution	-	-	104561	3
Disaster Assessment	-	-	104562	3
Geography of Climate Change	-	-	104563	3
Health GIS	-	-	104564	3
GIS and Globalization	-	-	104565	3
Spatial Analysis for Food Systems	-	-	104566	3
GIS for Settlement and Resettlement System	-	-	104567	3
Land and Property Information Management	-	-	104568	3
Public Participation GIS	-	-	104569	3
Total	-	-	≥5	≥15

4. Required Non-credit Courses

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Research Methodology in Science and Technology	104544	3	104544	3
Seminar	104545	1	104545	1
Total	2	4	2	4

5. Thesis Credit Requirements

Requirements	Option 1.1		Option 1.2	
	Course No.	Cr.	Course No.	Cr.
Thesis 1, Option 1.1	104571	6	-	-
Thesis 2, Option 1.1	104572	6	-	-
Thesis 3, Option 1.1	104573	12	-	-
Thesis 4, Option 1.1	104574	12	-	-
Thesis 1, Option 1.2	-	-	105595	3
Thesis 2, Option 1.2	-	-	105596	3
Thesis 3, Option 1.2	-	-	105597	6
Total	4	36	3	12