Master Degree

Master of Science Program in Functional Food and Nutrition

1. Name of degree and major

Full name: Master of Science (Functional Food and Nutrition)

Abbreviation name: M.Sc. (Functional Food and Nutrition)

2. Total credit in the program

Plan A1 (thesis only)	36	credits
Plan A2 (mixed mode)	36	credits

3. Qailification

Graduation in Bachelor dergree or equivalent is required.

3.1 Plan A1

Candidate must be graduated in Bachelor of Sceince in food science, health science or related major. Avergage grade point is 3.00 or above and incase grade point is lower than 3.00 additional qualification is required.

- Publication in qualified journal or with peer review at least 1 publication or
- Research experince in Science or related major at least 2 years.

3.2 Plane A2

Candidate must be graduated in Bachelor of Sceince in food science, health science or related major.

Final decision of acceptance with be duty of curriculum's committee considering from application and interview (if required).

4. Structure of curriculum

Master degree has 2 plans:

- Plan A1 is assigned for research oriented (thesis only). Extra 2 credits is required, 859-596 Seminar I and 859-597 Seminar II.
- Plan A2 is assigned for research and course study (mixed mode).

Number of total credit in the curriculum 36 credits

Structure

☐ **Plan A1** **36** **credits**

- Thesis 36 credits
- *Seminar I 1 credit
- *Seminar II 1 credit

* no. of credit is not counted

859-501 may required.

☐ **Plan A2** **36** **credits**

- Compulsory 12 credits
- Elective 6 credits
- Thesis 18 credits

859-501 may required.

5. Study plan

- Plan A1

Year	Semester	Subject	No. of credit
1	1	859-836 Thesis	9
	2	859-836 Thesis	9
		859-596* Seminar I	1
2	1	859-836 Thesis	9
	2	859-836 Thesis	9
		859-597* Seminar II	1
Minimum total credit			**36**

- Plan A2

Year	Semester	Subject	No. of credit
1	1	859-511 Food nutrition and health	3
		859-512 Metabolic pathway of nutraceutical and functional food	2
		859-513 Technology and commercialization of nutraceutical and functional food	3
		859-591 Research methodology in functional food and nutrition	2
		Total	**10**
	2	..... Elective	3
		..... Elective	3
		859-596 Seminar I	1
		859-818 Thesis	4
		Total	**11**
2	1	859-818 Thesis	7
		Total	**7**
	2	859-818 Thesis	7
		859-597 Seminar II	1
		Total	**8**
Minimum total credit			**36**

* no. of credit will not be counted.

6. Course description

6.1 Pre-requisite subject

859-501 Principles of Functional Food and Nutrition 2(2-0-4)

Basic of food chemistry and food analytical method; list of food additives allow to be used in food; basic of food microbiology, beneficial microorganisms for health or food industrial microorganisms; physical property and sensory evaluation of food; basic of functional food processing, impact on nutritional value; functional property of nutrient and

bioactive compound; regulation of functional food and dietary supplement and nutrition/supplement fact

6.2 Comulsory subject

859-511 Food, Nutrition and Health 3(3-0-6)

Overview of food, nutrition, and health in present lifestyle; nutrition guideline and assessment; human digestion and absorption system; functional properties of macronutrients micronutrients and trace elements; energy balance and body weight regulation; nutritional, exercise, and sport; nutritional application in life cycle; nutritional program designs and use of nutritional equipments

859-512 Nutraceutical and Functional Food in Metabolic Pathway 2(2-0-4)

Principles of metabolic pathway; energy of life and power cellular; regulation of metabolic section; metabolism of nutraceutical, functional food, dietary supplement, phytochemical and dietary fiber; role of nutraceutrical on gastrointestinal tract; anti-oxidation and their mechanism of action in oxidative stress and aging process; nutraceutical and functional food on glucose control; central nerve system; cardiovascular

859-513 Technology and Commercialization of Nutraceutical and Functional Food 3(3-0-6)

Role of food industry to nutraceutical and functional food; consumer' behavior for consumption of nutraceutical and functional food; technology of nutraceutical and functional food processing; extraction, separation and purification technology of bioactive compound/ functional food ingredient; encapsulation technology of pharmaceutical product and dietary supplement; technology of capsule and tablet of pharmaceutical product and dietary supplement; shelf life study and sensory evaluation of nutraceutical and functional food; packaging technology; development of product prototype; law and regulation of nutraceutical and functional food; and case study

859-591 Research Methodology in Functional Food and Nutrition 2(2-0-4)

The objective, rationale of research, research methodology and research ethics; academic review and data collection from various sources; analytical and problem solving techniques for functional food and nutrition topics; research planning process; writing process of thesis proposal; quantitative and qualitative analysis; design of experiments and

statistical methods for research; plagiarism check; research reporting and thesis preparation, communication skill and presentation

859-596 Seminar I **1(0-2-1)**

Presentation the up-to-date academic knowledge, information, and research in the functional food and nutrition field; research literature reviews; experimental design and application; final report submitting

859-597 Seminar II **1(0-2-1)**

Presentation and report in progress of ongoing research; research data analysis and interpretation; final report submitting

859-818 Thesis **18(0-54-0)**

Study, searching and research to gain basic knowledge, theory or proof the theory in functional food and nutrition; quantity and quality of research must be performed accordance with the credits enrolled under supervision of advisory committee; selection of thesis topic; writing research background and rationale, objectives, research problems, hypotheses, research plan and methodology, results and discussion, conclusions and recommendation; writing a complete thesis; research progress must be presented each semester

859-836 Thesis **36(0-108-0)**

Study, searching and research to gain knowledge, new theory or innovation in functional food and nutrition; quantity and quality of research must be performed accordance with the credits enrolled under supervision of advisory committee; selection of thesis topic; writing research background and rationale, objectives, research problems, hypotheses, research plan and methodology, results and discussion, conclusions and recommendation; writing a complete thesis; research progress must be presented each semester

6.3 Elective subject

859-521 Community Nutrition 2(2-0-4)

Distribution of population; economic and social status; relationship between food safety and food, nutrition stability; nutrients; illness caused malnutrition; status of community nutrition in Thailand; guidance to improve and manage the diet and nutritional status of Thailand; case study

859-522 Nutrition in Health and Disease 3(3-0-6)

Relationship of nutrition in health and disease; illness and disease from malnutrition such as chronic non-communicable diseases including diabetes, high blood pressure, cardiovascular disease; anatomical disorder, nutritional assessment; important diseases; role of food, dietary supplement and diet therapy in their prevention and care; case study

859-523 Toxicology and Safety Evaluation in Nutraceutical and Functional Food 3(2-3-4)

Adverse effect of non-nutritional components of food in terms of carcinogenesis; mutagenesis and teratogenesis; toxicity caused by over consumption of food or other sources containing excess nutrients; evaluation of toxicity; factors affecting toxicity; mechanism of toxicity in systems of the body; signs of toxic; to solve the poisoning; the therapy and analysis of different types of toxins; study of efficiency and safety *in vitro*; animal cell culture, animal study and clinical test of bioactive agents and product; and laboratory

859-524 Advanced Nutritional Biochemistry 3(3-0-6)

Advance in protein and amino acids; production technology of protein and amino acids for food and medicine; nutritional approach and health enhance by protein and amino acids; advance in carbohydrate and lipid on regulation an function; metabolism of carbohydrate and lipid affect to health and diseases; advance of water and fat soluble vitamins with mimeral and trace elements affect to health and diseases; metaolism of action of protine carbohydrate lipid vitamin and mineral affect to genetic expression; up-to-date research in nutritional biochemistry of protein, amino acids, carbohydrate, lipid, vitamin, mineral, and trace element

859-531 Functional Ingredient in Nutraceutical and Functional Food 3(3-0-6)

Functional ingredients that have properties in anti-aging; antioxidant; effect to bone and teeth; to make calm and sleepiness; effect to brain and memory; dietary fiber and functional ingredients impact to digestive tract; involve in energy balance; involve in eyes and vision; impacts to cardiovascular diseases; involve in immunity system; impact to joint and inflammation; for weight control; for beauty; amount and dosage form; manufacturer and distributor; applications of functional ingredient in nutraceutical and functional food

859-532 Nutrigenomics and Nutricosmatics 3(3-0-6)

Overview of nutrigenomics and nutrigenetics; mechanism of epigenetic modification; gene polymorphism and respond to diet; bioactives, function and interaction of molecules with genes; anti-aging in cellular level and retardation of biological activity; nutricosmatics on skin, hair and figure; bioactive ingredients and control of gene expression; Up-to-date knowledge in nutrigenomics and nutrigenomics

859-533 Nutraceutical and Functional Food Development 3(2-3-4)

Importance of nutraceutical and functional food development; supplied chain of nutraceutical and functional food; relationship between consumer and market; relationship among social, industry and technology; consumer and marketing research; guideline of nutraceutical and functional food development; product development from laboratory to production in pilot plant; project feasibility study; safety, regulation and standard of nutraceutical and functional food; case study

859-534 Selected Topics in Functional Food and Nutrition 3(2-3-4)

Up-to-date and interesting topics in the area of functional food and nutrition such as nutrigenomics and nutrigenetics; functional food ingredient; animal cell culture for testing of biological activities; probiotic and prebiotic; herbs and spices; bioactive peptide; membrane for production of bioactive compound; antioxidants technique and analysis of bioactive compounds

859-535 Health Food of ASEAN 3(3-0-6)

Biodiversity, history and originality of health food in ASEAN; safety, security, sustainability, and quality control of health food; ASEAN grains; antiaging and longevity ASEAN

food; health food from fruits and vegetables, fermented foods, herbs, spices and curry in ASEAN; Halal health food and food processing according to Islam religion; alternative medicine and treatment for health promotion; health food and functional ingredient in ASEAN; nutritional policies and food regulation in ASEAN; visiting of factory or SME producing health food or knowledge and experience sharing by entrepreneur

859-542 Chemical Analysis of Bioactive Agents 3(2-3-4)

Method of sample preparation, purification and analysis of potential bioactive substances such as phytoestrogens; conjugated double bond fatty acid and ω-3,6 fatty acid; carotenoids and flavonoids substances amino acids; carbohydrate and related compounds compile with food; dietary supplement and functional food standard using chromatography (TLC, GC, HPLC) and spectroscopy techniques (UV-Vis, NMR, FTIR) or appropriate technique; laboratory of analysis method by previous technique

859-543 Regulation and Standard, Registration of Nutraceutical and Functional Food 2(2-0-4)

Importance of regulation; registration and standard of nutraceutical and functional food on product; consumer and business of nutraceutical and functional food; regulation and standard of nutraceutical and functional food in Thailand, U. S. A. , EU and Japan; regulation and standard for safety of nutraceutical and functional food; health claim and marketing of nutraceutical and functional food; role of Thai FDA for market promotion of nutraceutical and functional food; example of approved nutraceutical and functional food by Food and Drug Administration

859-551 Entrepreneur and Innovation of Nutraceutical and Functional Food 3(3-0-6)

Construction of idea for entrepreneur or startup of nutraceutical and functional food business; principles of business management; marketing management and sale forecasting; business management and project feasibility study, business project writing of nutraceutical and functional food; nutraceutical and functional food business; finance and accounting of small business; retail management and e-commerce management; patent searching and mapping and patent submission; innovation management and utilization of technology for business and commerce; law, taxation and source of money investment for business