

**List of Subjects for UGM Student**  
**Academic Year 2022**

<b>Semester 1</b>			
<b>No.</b>	<b>Subject Code</b>	<b>Subject Name</b>	<b>Credit</b>
1	859-495	Seminar	1
2	859-496	Senior Project I	2
3	850-511	Functional Properties of Food Components	3 (2-3-4)
4	850-551	Advanced Food Processing	3 (2-3-4)
5	853-431	Fermentation Technology	3 (2-3-4)
6	855-501	Packaging Technology	3 (3-0-6)
7	855-502	Packaging Technology Lab.	1 (0-3-0)
8	859-511	Food, Nutrition and Health	3 (3-0-6)
9	859-512	Functional Food and Nutraceutical in Metabolic Pathway	2 (2-0-4)
10	859-513	Technology and Commercialization of Functional Food and Nutraceutical	3 (3-0-6)
<b>Semester 2</b>			
1	859-497	Senior Project II	4
2	850-581	Utilization of By-Products from Fishery Industry	3 (2-3-4)
3	853-461	Biotechnology in Food Industry	3 (2-3-4)
4	859-521	Module in Innovation of Functional Food and Nutraceutical	7 (6-3-12)

<b>Semester 1</b>		<b>Semester 2</b>	
<b>3-4 study courses</b>	<b>10-11 credits</b>	<b>1 study course</b>	<b>3 credits</b>
1. Seminar	1 credit	1. Senior Project II	4 credits
2. Senior Project I	2 credits		
*Senior project starts working from Semester 1 - 2			
<b>Total = 10-11 + 3 = 13-14 credits</b>			

- Important tasks for 1<sup>st</sup> semester
  - Seminar
  - Prepare and present senior project proposal (Oct- Nov)
  - Start preliminary study

## **Course description**

### **850-511 Functional Properties of Food Components**

**3 (2-3-4)**

Functional properties of water, carbohydrate, protein and fat in foods, mode of action, interaction of food components, role of components in characteristics and quality improvement of foods

### **850-551 Advanced Food Processing**

**3 (2-3-4)**

Advanced and novel food processing technologies including thermal processing (aseptic process and ohmic and microwave heating), non-thermal processing (high pressure processing, pulsed electric field, high intensity pulsed light and ultrasound), separation technique (membrane filtration and supercritical extraction), minimal processing (ozone, nanobubble, hurdle technique), texturization technique (extrusion technology), case studies and field study

### **850-581 Utilization of By-Products from Fishery Industry**

**3 (2-3-4)**

Sources and compositions of wastes from fishery processing industry, production and properties of value-added products from by-products produced using different technologies including hydrolysis, extraction, drying, fermentation, etc. applications of by-products and their products as food ingredients, functional food, food supplement, etc.

### **853-431 Fermentation Technology**

**3 (2-3-4)**

Importance of fermentation industry; isolation and selection of important microorganisms in industry; improvement of microorganisms; media and inoculum preparation; fermentors and equipment related to fermentation process; product recovery; food and non-food fermented products; field trips

### **853-461 Biotechnology in Food Industry**

**3 (2-3-4)**

Biotechnology for food industry including recombinant DNA technology, enzyme technology, diagnostic biotechnology and microbial technology that effect on quality of raw material, nutrition values, processing and packaging; application of biotechnology in beverages industry, dairy products, fruit and vegetable products, tradition fermented food safety and waste treatment from food industry; application of molecular technique in food industry and sanitation; ethics in safety and regulation related to food biotechnology

### **855-501 Packaging Technology**

**3 (3-0-6)**

Fundamentals of packaging technology, classifications of packaging, functions of packaging; fundamentals of polymer technology, application of polymer in packaging, basic test methods for polymer packaging ; fundamentals of pulp and paper technology, application of pulp and paper in packaging, basic test methods for paper packaging; fundamentals of glass and metal, application of glass and metal in packaging, basic test methods for glass and metal packaging; fundamentals of packaging design, packaging economics, optimization design of packaging materials usage, design and analysis of packaging structures

**855-502 Packaging Technology 1 (0-3-0)**  
Packaging Technology Laboratory related to 855-501 course

**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 Module in Innovation of Functional Food and Nutraceutical 3 (3-0-6)**  
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 nutraceutical 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 Functional Food and Nutraceutical 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

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