



**Universitas Negeri Surabaya
Faculty of Sports and Health Sciences,
Undergraduate Nutrition Study Program**

**Document
Code**

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight	SEMESTER	Compilation Date												
Food Science	1321102090	Compulsory Study Program Subjects	T=0 P=2 ECTS=3.18	1	April 27, 2023												
AUTHORIZATION	SP Developer		Course Cluster Coordinator	Study Program Coordinator													
	Amalia Ruhana, SP., MPH		Noor Rohmah Mayasari, S.TP., M.P.H., Ph.D	Amalia Ruhana, S.P., M.P.H.													
Learning model	Case Studies																
Program Learning Outcomes (PLO)	PLO study program that is charged to the course																
	PLO-6	Able to utilize science and technology in self-development and solving nutritional problems.															
	PLO-8	Able to master the scientific basis of nutrition, food, biomedicine, humanities and public health sciences.															
	PLO-11	Able to solve problems in the field of nutrition by applying scientific thinking concepts and cutting-edge approaches through research, scientific literacy and publications.															
	Program Objectives (PO)																
	PLO-PO Matrix																
		P.O	PLO-6	PLO-8	PLO-11												
PO Matrix at the end of each learning stage (Sub-PO)																	
	P.O	Week															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Short Course Description	Discussion of the types and properties of food ingredients, both physically and chemically, the practice of observing food ingredients, the properties of food ingredients, and analysis of changes in the properties of food ingredients. Learning is carried out by providing theory, assignments, practice and discussions																
References	Main :																
	<ol style="list-style-type: none"> 1. Buckle, KA., Edwards, RA., Fleet GH., Wootton, M. 1987. Ilmu Pangan. UI Press. Jakarta 2. Muchtadi, TR. 2013. Ilmu Pengetahuan Bahan Pangan. PT Alfabeta. Jakarta 3. Warsito, H., Rindiani, F. Nurdyansyah. 2015. Ilmu Bahan Makanan Dasar. Nuha Medika. Yogyakarta 4. Nugraheni, M. 2012. Pengetahuan Bahan Pangan Hewani. Graha Ilmu. Yogyakarta 5. Nugraheni, M. 2016. Pengetahuan Bahan Pangan Nabati. Plantaxia. Yogyakarta 6. Rahmi Y., T S Kusuma. 2020. Ilmu Bahan Makanan. UB Press. Malang 																
	Supporters:																
	1. Permenkes no 41 tahun 2014 tentang Pedoman Gizi Seimbang																
Supporting lecturer	Dra. Veni Indrawati, M.Kes. Dra. Rahayu Dewi Soeyono, M.Si. Prof. Dr. Rita Ismawati, S.Pd., M.Kes. Amalia Ruhana, S.P., M.P.H.																
Week-	Final abilities of each learning stage (Sub-PO)	Evaluation		Help Learning, Learning methods, Student Assignments, [Estimated time]		Learning materials [References]	Assessment Weight (%)										
		Indicator	Criteria & Form	Offline (offline)	Online (online)												
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)										

1	<p>1. Carry out a lecture contract and understand the Food Science RPS</p> <p>2. Explains the technical aspects of Food Ingredient Science lectures</p> <p>3. Explains the technical aspects of Food Ingredient Science practicum</p>			Problem based learning 2 X 50			0%
2	<p>1. Explain the characteristics of Cereals</p> <p>2. Explain the characteristics of Nuts</p>	<p>1. Explain the structure of cereal seeds</p> <p>2. Explain the physical characteristics of Rice, Corn, Wheat, Sorghum, Rye, Oats</p> <p>3. Explain the types of rice, corn, wheat</p> <p>4. Explain the meaning of the polishing process, the degree of polishing, head rice, broken rice, rice groats</p> <p>5. Explaining the nutritional content of rice, corn, wheat, sorghum, rye, oats (including amylose, amylopectin, gluten)</p> <p>6. Explaining the Quality Requirements for Rice, Corn, Wheat Flour (based on SNI)</p> <p>7. Explain the structure of legume seeds</p> <p>8. Explain the nutritional content of soybeans, green beans, peanuts, red beans</p> <p>9. Explain the anti-nutritional substances in nuts</p> <p>10. Explain the quality requirements for peanuts, green beans, soybeans (based on SNI)</p>	<p>Criteria: Students get a score of 2 if the answer is correct, and a score of zero if the answer is wrong</p> <p>Form of Assessment : Practice / Performance</p>	Learning Method: problem based learning, practicum 2 X 50		<p>Material: Cereals and Nuts</p> <p>Reference: <i>Rahmi Y., TS Kusuma. 2020. Food Ingredient Science. UB Press. Poor</i></p> <hr/> <p>Material: Cereals and Legumes</p> <p>Reference: <i>Muchtadi, TR. 2013. Food Ingredient Science. PT Alfabeta. Jakarta</i></p> <hr/> <p>Material: Cereals and Legumes</p> <p>Reference: <i>Nugraheni, M. 2016. Knowledge of Vegetable Food Ingredients. Plantaxia. Yogyakarta</i></p>	5%

3	Understand the characteristics of tubers	<p>1.Explaining the characteristics of cassava, sweet potato, potato, taro, gadung, arrowroot, kimpul, gembili, porang</p> <p>2.Explain the nutritional content of cassava, sweet potato, potato, taro, gadung, arrowroot, kimpul, gembili, porang</p> <p>3.Explain the quality requirements for potatoes, sweet potatoes</p>	<p>Criteria: Students get a score of 2 if the answer is correct, and a score of zero if the answer is wrong</p> <p>Form of Assessment : Practice / Performance</p>	<p>Learning Method: problem based learning, practicum 2 X 50</p>		<p>Material: Tubers</p> <p>References: <i>Buckle, KA., Edwards, RA., Fleet GH., Wootton, M. 1987. Food Science. UI Press. Jakarta</i></p> <hr/> <p>Material: tubers</p> <p>Reference: <i>Rahmi Y., TS Kusuma. 2020. Food Ingredient Science. UB Press. Poor</i></p> <hr/> <p>Material: Tubers</p> <p>Library: <i>Muchtadi, TR. 2013. Food Ingredient Science. PT Alfabeta. Jakarta</i></p> <hr/> <p>Material: Tubers</p> <p>Reference: <i>Nugraheni, M. 2016. Knowledge of Vegetable Food Ingredients. Plantaxia. Yogyakarta</i></p>	5%
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4	Understand the characteristics of vegetables and fruit	<ol style="list-style-type: none"> 1.Explain the structure of vegetables 2.Explains cell turgor, vegetable texture 3.Explain pigments in vegetables 4.Explain post-harvest handling of vegetables 5.Explain the structure of fruits (tissue system, basic system, transport system) 6.Explain fruit pigments 7.Explain changes in fruit physiology after harvest 8.Explain climacteric fruit 9.Explain the role of ethylene in the fruit ripening process 10.Explain the physical and chemical changes during ripening 11.Explain post-harvest handling of fruit 	<p>Criteria: Students get a score of 2 if the answer is correct, and a score of zero if the answer is wrong</p> <p>Form of Assessment : Practice / Performance</p>	Learning Method: problem based learning, practicum 2 X 50		<p>Material: Fruits and Vegetables Reference: <i>Rahmi Y., TS Kusuma. 2020. Food Ingredient Science. UB Press. Poor</i></p> <hr/> <p>Material: Fruits and Vegetables Reference: <i>Nugraheni, M. 2016. Knowledge of Vegetable Food Ingredients. Plantaxia. Yogyakarta</i></p> <hr/> <p>Material: Fruits and Vegetables Reference: <i>Muchtadi, TR. 2013. Food Ingredient Science. PT Alfabeta. Jakarta</i></p>	5%
5	Explaining the Characteristics of Herbs and Spices	<ol style="list-style-type: none"> 1.Explaining types of spices, Indonesian spices, Oriental spices, Continental spices 2.Explain the morphology and nutritional composition of spices in ginger, turmeric, ginger, galangal, ginger, ginger, galangal, onions, chilies. 	<p>Criteria: Students get a score of 2 if the answer is correct, and a score of zero if the answer is wrong</p> <p>Form of Assessment : Practice / Performance</p>	Learning Method: problem based learning, practicum 2 X 50		<p>Material: Herbs and Spices Library: <i>Muchtadi, TR. 2013. Food Ingredient Science. PT Alfabeta. Jakarta</i></p> <hr/> <p>Material: Herbs and Spices Library: <i>Rahmi Y., TS Kusuma. 2020. Food Ingredient Science. UB Press. Poor</i></p>	8%

6	Explaining the List of Exchange Food Ingredients (DBMP)	<ol style="list-style-type: none"> 1.Explain the meaning of DBMP 2.Explain the classification of food ingredients based on DBMP 3.Explaining Group I 4.Explaining Group II 5.Explaining Group III 6.Explaining Group IV 7.Explaining Group V 8.Explaining Group VI 9.Explaining Group VII 10.Explaining Group VIII 11.Example of using calculations with DBMP 	<p>Criteria: Students get a score of 2 if the answer is correct, and zero if the answer is wrong</p> <p>Form of Assessment : Practice / Performance</p>	Learning Method: problem based learning 2 X 50		<p>Material: List of Food Ingredient Exchanges Reference: <i>Minister of Health Regulation no. 41 of 2014 concerning Guidelines for Balanced Nutrition</i></p>	8%
7	Describes the characteristics of refreshing ingredients and sweetening sugar	<ol style="list-style-type: none"> 1.Explain the meaning of sugar 2.Explain the physical and chemical characteristics of sugar 3.Explaining Granulated Sugar, Caster Sugar, Refined Sugar, Rock Sugar, Brown Sugar, Palm Sugar, Brown Sugar, Palm Sugar, Maple Syrup, Stevia Sugar, Honey (composition and characteristics of honey) 4.Explaining Artificial Sweeteners 5.Explain the meaning of refreshing ingredients 6.Explain the types of tea including White tea, Green Tea, Oolong tea, black tea and SNI for tea products 7.Explains the types of coffee (arabica, robusta), SNI Coffee, Coffee quality assessment 8.Explaining types of cocoa, types of chocolate, chocolate processing processes, SNI Chocolate 	<p>Criteria: Students get a score of 2 if the answer is correct, and zero if the answer is wrong</p> <p>Form of Assessment : Practice / Performance</p>	Learning Method: problem based learning, practicum 2 X 50		<p>Material: Refreshing ingredients and sweetening sugar. Reference: <i>Buckle, KA., Edwards, RA., Fleet GH., Wootton, M. 1987. Food Science. UI Press. Jakarta</i></p> <hr/> <p>Material: Refreshing ingredients and sweeteners. Reference: <i>Rahmi Y., TS Kusuma. 2020. Food Ingredient Science. UB Press. Poor</i></p> <hr/> <p>Material: Refreshing Ingredients and Sugar Sweetener Reference: <i>Muchtadi, TR. 2013. Food Ingredient Science. PT Alfabeta. Jakarta</i></p>	8%

8	Midterm exam		Form of Assessment : Test	2 X 50			10%
9	Describe the characteristics of Milk and Processed Products	<ol style="list-style-type: none"> 1.Explain the meaning of milk 2.Explain the physical properties and chemical composition of milk (milk structure, milk fat, milk protein, milk carbohydrates, minerals and vitamins, milk pigments) 3.Explain the factors that influence the composition of milk 4.Explain changes after milking 5.Explaining Milk Storage 6.Explain milk derivative products 7.Explains SNI for milk and SNI for milk derivative products 	<p>Criteria: Students get a score of 2 if the answer is correct, and a score of zero if the answer is wrong</p> <p>Form of Assessment : Practice / Performance</p>	Learning Method: Problem Based Learning, Practicum 2 X 50		<p>Material: Milk and its Processing References: <i>Buckle, KA., Edwards, RA., Fleet GH., Wootton, M. 1987. Food Science. UI Press. Jakarta</i></p> <p>Material: Milk and its Processing References: <i>Muchtadi, TR. 2013. Food Ingredient Science. PT Alfabeta. Jakarta</i></p> <p>Material: Milk and its Processing References: <i>Rahmi Y., TS Kusuma. 2020. Food Ingredient Science. UB Press. Poor</i></p>	5%
10	Explain the characteristics of Oils and Fats	<ol style="list-style-type: none"> 1.Explain the meaning of oil and fat 2.Explain the types of oils and fats 3.Explain the types of palmae that contain oil and fat (coconut and palm oil) 4.Explain the types of nuts that contain oil and fat (peanuts, soybeans) 5.Explain the types of cereals and seeds that contain oil and fat (corn, sunflower seeds, rice bran, olives, canola) 6.Explaining solid fats (Butter fat, beef tallow, lard, fish oil) 7.Explain the effect of storage on the quality of materials 8.Explaining SNI for oil 	<p>Criteria: Students will get a score of 2 if the answer is correct, and a score of zero if the answer is wrong</p> <p>Form of Assessment : Practice / Performance</p>	Learning Method: problem based learning, practicum 2 X 50		<p>Material: Oils and Fats Reference: <i>Muchtadi, TR. 2013. Food Ingredient Science. PT Alfabeta. Jakarta</i></p> <p>Material: Oils and Fats References: <i>Buckle, KA., Edwards, RA., Fleet GH., Wootton, M. 1987. Food Science. UI Press. Jakarta</i></p> <p>Material: Oils and Fats Reference: <i>Rahmi Y., TS Kusuma. 2020. Food Ingredient Science. UB Press. Poor</i></p>	8%

11	Explain the characteristics of Meat and Poultry	<ol style="list-style-type: none"> 1.Explaining the Definition of Meat 2.Explain the structure of meat (muscle tissue, fat tissue, connective tissue) 3.Explain the differences between beef, buffalo meat, pork, goat meat 4.Explain postmortem physiology (pH changes, muscle tissue rigor, protein solubility, water holding capacity) 5.Explain Postmortem Handling (aging of meat, curing meat) 6.Explain proper storage methods (cooling, freezing, packaging) 7.Explaining SNI for beef carcass quality 8.Explain the meaning of poultry 9.Explain the types of poultry 10.Describe poultry carcasses 11.Explain the structure and composition of poultry tissue 12.Explain postmortem physiology (pH changes, muscle tissue structure, protein solubility, water holding capacity) 13.Explain post mortem handling (withering poultry, freezing) 14.Explaining SNI for poultry carcass quality 	<p>Criteria: Students get a score of 2 if the answer is correct, and zero if the answer is wrong</p> <p>Form of Assessment : Practice / Performance</p>	<p>Learning Method: problem based learning, practicum 2 X 50</p>		<p>Material: Meat and Poultry Reference: <i>Buckle, KA., Edwards, RA., Fleet GH., Wootton, M. 1987. Food Science. UI Press. Jakarta</i></p> <hr/> <p>Material: Meat and Poultry Reference: <i>Muchtadi, TR. 2013. Food Ingredient Science. PT Alfabeta. Jakarta</i></p> <hr/> <p>Material: Meat and Poultry Reference: <i>Nugraheni, M. 2012. Knowledge of Animal Food Ingredients. Science House. Yogyakarta</i></p> <hr/> <p>Material: Meat and Poultry Reference: <i>Rahmi Y., TS Kusuma. 2020. Food Ingredient Science. UB Press. Poor</i></p>	8%
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12	Explain the characteristics of Meat and Poultry	<ol style="list-style-type: none"> 1.Explain the meaning of eggs 2.Explain the types of eggs 3.Explain the composition of eggs 4.Explain the functional properties of eggs (coagulation power, foaming power, emulsify power, crystallization control, coloring) 5.Explain the structure of eggs (process of egg formation, egg morphology) 6.Explain the parts of an egg 7.Explain egg irregularities 8.Explain egg storage 9.Explaining SNI for eggs 	<p>Criteria: Students will get a score of 2 if they can answer the question correctly, and a score of zero if they answer incorrectly</p> <p>Form of Assessment : Practice / Performance</p>	Learning Method: problem based learning, practicum 2 X 50		<p>Material: Eggs References: <i>Buckle, KA., Edwards, RA., Fleet GH., Wootton, M. 1987. Food Science. UI Press. Jakarta</i></p> <hr/> <p>Material: Eggs Library: <i>Muchtadi, TR. 2013. Food Ingredient Science. PT Alfabeta. Jakarta</i></p> <hr/> <p>Material: Eggs Reference: <i>Nugraheni, M. 2012. Knowledge of Animal Food Ingredients. Science House. Yogyakarta</i></p> <hr/> <p>Material: Eggs Library: <i>Rahmi Y., TS Kusuma. 2020. Food Ingredient Science. UB Press. Poor</i></p>	5%
13	Understand the characteristics of Fish and Other Marine Animals	<ol style="list-style-type: none"> 1.Explain the meaning of seafood 2.Explain the types of seafood 3.Explain the chemical composition of fish 4.Explain the post-harvest phase of fish and other marine animals 5.Explain the quality assessment of fish and other marine animals 6.Explain fish storage 	<p>Criteria: Students get a score of 2 if they answer correctly, and a score of zero if they answer incorrectly</p> <p>Form of Assessment : Practice / Performance</p>	Learning Method: problem based learning, practicum 2 X 50		<p>Material: Fish and other marine animals References: <i>Muchtadi, TR. 2013. Food Ingredient Science. PT Alfabeta. Jakarta</i></p> <hr/> <p>Material: Fish and other marine animals Reference: <i>Nugraheni, M. 2012. Knowledge of Animal Food Ingredients. Science House. Yogyakarta</i></p> <hr/> <p>Material: Fish and other marine animals References: <i>Rahmi Y., TS Kusuma. 2020. Food Ingredient Science. UB Press. Poor</i></p>	5%
14	Practical Fruit Vegetables, Sugar Sweeteners, Refreshing Ingredients, Milk, Meat, Fish, Spices, Cereals, Nuts, Oil		<p>Criteria: Students get a score of 2 if the answer is correct, and a score of zero if they are wrong</p> <p>Form of Assessment :</p>	Learning Method: 2 X 50 practicum		<p>Materials: Fruit Vegetables, Sugar Sweeteners, Refreshing Ingredients,</p>	0%

Practical Assessment,
Practice/Performance

Milk, Meat,
Fish, Spices,
Cereals,
Nuts, Oils
Library:
*Rahmi Y., TS
Kusuma.
2020. Food
Ingredient
Science. UB
Press. Poor*

Material:
Fruit
Vegetables,
Sugar
Sweeteners,
Refreshing
Ingredients,
Milk, Meat,
Fish, Spices,
Cereals,
Nuts, Oils
Library:
*Buckle, KA.,
Edwards,
RA., Fleet
GH.,
Wootton, M.
1987. Food
Science . UI
Press.
Jakarta*

Materials:
Fruit
Vegetables,
Sugar
Sweeteners,
Refreshing
Ingredients,
Milk, Meat,
Fish, Spices,
Cereals,
Nuts, Oils
Library:
*Muchtadi,
TR. 2013.
Food
Ingredient
Science. PT
Alfabeta.
Jakarta*

Material:
Fruit
Vegetables,
Sugar
Sweeteners,
Refreshing
Ingredients,
Milk, Meat,
Fish, Spices,
Cereals,
Nuts, Oils
Library:
*Warsito, H.,
Rindiani, F.
Nurdyansyah.
2015. Basic
Food
Science.
Nuha Medika.
Yogyakarta*

Material:
Fruit
Vegetables,
Sugar
Sweeteners,
Refreshing
Ingredients,
Milk, Meat,
Fish, Spices,
Cereals,
Nuts, Oils
Library:
*Nugraheni,
M. 2012.
Knowledge of
Animal Food
Ingredients.*

					<p>Science House. Yogyakarta</p> <p>Material: Fruit Vegetables, Sugar Sweeteners, Refreshing Ingredients, Milk, Meat, Fish, Spices, Cereals, Nuts, Oils Library: <i>Nugraheni, M. 2016. Knowledge of Vegetable Food Ingredients. Plantaxia.</i></p>	
15	<p>Practical Fruit Vegetables, Sugar Sweeteners, Refreshing Ingredients, Milk, Meat, Fish, Spices, Cereals, Nuts, Oil</p>		<p>Criteria: Students get a score of 2 if the answer is correct, and a score of zero if they are wrong</p> <p>Form of Assessment : Practical Assessment, Practice/Performance</p>	<p>Learning Method: 2 X 50 practicum</p>	<p>Yogyakarta Materials: Fruit Vegetables, Sugar Sweeteners, Refreshing Ingredients, Milk, Meat, Fish, Spices, Cereals, Nuts, Oils Library: <i>Rahmi Y., TS Kusuma. 2020. Food Ingredient Science. UB Press. Poor</i></p> <p>Material: Fruit Vegetables, Sugar Sweeteners, Refreshing Ingredients, Milk, Meat, Fish, Spices, Cereals, Nuts, Oils Library: <i>Buckle, KA., Edwards, RA., Fleet GH., Wootton, M. 1987. Food Science . UI Press. Jakarta</i></p> <p>Materials: Fruit Vegetables, Sugar Sweeteners, Refreshing Ingredients, Milk, Meat, Fish, Spices, Cereals, Nuts, Oils Library: <i>Muchtadi, TR. 2013. Food Ingredient Science. PT Alfabeta. Jakarta</i></p> <p>Material: Fruit Vegetables, Sugar Sweeteners, Refreshing Ingredients, Milk, Meat,</p>	5%

						Fish, Spices, Cereals, Nuts, Oils Library: <i>Warsito, H., Rindiani, F., Nurdyansyah. 2015. Basic Food Science. Nuha Medika. Yogyakarta</i> <hr/> Material: Fruit Vegetables, Sugar Sweeteners, Refreshing Ingredients, Milk, Meat, Fish, Spices, Cereals, Nuts, Oils Library: <i>Nugraheni, M. 2012. Knowledge of Animal Food Ingredients. Science House. Yogyakarta</i> <hr/> Material: Fruit Vegetables, Sugar Sweeteners, Refreshing Ingredients, Milk, Meat, Fish, Spices, Cereals, Nuts, Oils Library: <i>Nugraheni, M. 2016. Knowledge of Vegetable Food Ingredients. Plantaxia. Yogyakarta</i>	
16	Final exams		Form of Assessment : Test				10%

Evaluation Percentage Recap: Case Study

No	Evaluation	Percentage
1.	Practical Assessment	2.5%
2.	Practice / Performance	72.5%
3.	Test	20%
		95%

Notes

- 1. Learning Outcomes of Study Program Graduates (PLO - Study Program)** are the abilities possessed by each Study Program graduate which are the internalization of attitudes, mastery of knowledge and skills according to the level of their study program obtained through the learning process.
- 2. The PLO imposed on courses** are several learning outcomes of study program graduates (CPL-Study Program) which are used for the formation/development of a course consisting of aspects of attitude, general skills, special skills and knowledge.
- 3. Program Objectives (PO)** are abilities that are specifically described from the PLO assigned to a course, and are specific to the study material or learning materials for that course.
- 4. Subject Sub-PO (Sub-PO)** is a capability that is specifically described from the PO that can be measured or observed and is the final ability that is planned at each learning stage, and is specific to the learning material of the course.
- 5. Indicators for assessing** abilities in the process and student learning outcomes are specific and measurable statements that identify the abilities or performance of student learning outcomes accompanied by evidence.
- 6. Assessment Criteria** are benchmarks used as a measure or measure of learning achievement in assessments based on predetermined indicators. Assessment criteria are guidelines for assessors so that assessments are consistent and unbiased. Criteria can be quantitative or qualitative.

7. **Forms of assessment:** test and non-test.
8. **Forms of learning:** Lecture, Response, Tutorial, Seminar or equivalent, Practicum, Studio Practice, Workshop Practice, Field Practice, Research, Community Service and/or other equivalent forms of learning.
9. **Learning Methods:** Small Group Discussion, Role-Play & Simulation, Discovery Learning, Self-Directed Learning, Cooperative Learning, Collaborative Learning, Contextual Learning, Project Based Learning, and other equivalent methods.
10. **Learning materials** are details or descriptions of study materials which can be presented in the form of several main points and sub-topics.
11. **The assessment weight** is the percentage of assessment of each sub-PO achievement whose size is proportional to the level of difficulty of achieving that sub-PO, and the total is 100%.
12. TM=Face to face, PT=Structured assignments, BM=Independent study.