						Document Code

Universitas Negeri Surabaya
Faculty of Engineering
, Undergraduate Culinary Education Study Program

SEMESTER LEARNING PLAN

Courses	CODE	Course Family	Credit Weight			SEMESTER	Compilation Date
Food Chemistry	8321102088		T=2	P=0	ECTS=3.18	1	July 18, 2024

AUTHORIZATION	SP Developer	Course Cluster Coordinator	Study Program Coordinator
	....	....	Dr. Hj. Sri Handajani, S.Pd., M.Kes.

Learning model	**Project Based Learning**

Program Learning Outcomes (PLO)	**PLO study program that is charged to the course**
	Program Objectives (PO)
	PLO-PO Matrix

	P.O

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	This course discusses the structure and chemical properties of various components contained in food ingredients as well as the changes that occur during the food processing process. Through this course, undergraduate students in Culinary Education are expected to have analytical competence in food components which include water, carbohydrates, proteins, oils and fats, enzymes, and food additives, and can apply them in the process of making food based on the principles of food chemistry.

References	**Main :**

1. F.G.Winarno, 1997. Kimia Pangan dan Gizi. PT Gramedia,Jakarta
2. Ponis Tarigan.1996. Kimia Organik Bahan Makanan. Bandung: Alumni
3. Riswiyanto. 2002. Kimia Organik. Jakarta: Erlangga.

	Supporters:

Supporting lecturer	Dra. Hj. Siti Sulandjari, M.Si. 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	. Understanding the lecture contract: rules, RPS, assignments	1. Make a study contract 2. Print Food Chemistry RPS 3. Describe the type of task		Online discussion 2 X 50			0%

2	Understand basic chemical bonds and chemical reactions	1. Describe ionic bonds 2. Describe covalent bonds 3. Describe coordination bonds 4. Describe hydrogen bonds 5. Describe the addition reaction 6. Describe substitution reactions 7. Describe elimination reactions	**Criteria:** Declared mastery if the results of the work show more than 75% correctness	Model: cooperative Method: discussion and assignment 2 X 50			0%
3	Understand the chemical theory of water in food	1. Explain the structure, bonds, chemical properties and dissociation of water 2. Explain Explain Water in food (free and bound) 3. Explain the types of water (crystalline water, constitution, adsorption, imbibition) 4. Explain the types of water in food (types I – IV) 5. Explain the levels and activity of water in food and related food spoilage 6. Explain water activity (Aw) in relation to water balance,		Model: Cooperative Method: Discussion and assignment 2 X 50			0%
4	Understand the concept of solutions, types of solutions, solution concentrations and solution properties	1. Compare solutions, colloids and suspensions 2. Calculate the concentration of solution in % 3. Calculate the concentration of the molar dam solution 4. Calculate the concentration of the solution in ppm 5. Describe the properties of acids, bases and salts 6. Explain the degree of acidity of food ingredients		Model: Cooperative Method: Discussion and assignment 2 X 50			0%

5	Understand the classification of carbohydrates and their application in the food sector	1. Explain the classification of monosaccharides (hexoses and pentoses, aldoses and ketoses) 2. Explain the chemical structure of monosaccharides 3. Explain the meaning and examples of isomeric and epimer compounds 4. Explain the ring structure of furanose, pyranose and the types of alpha and beta eantiomers and their effect on the formation of glycosidic bonds 5. Explain the chemical structure of the oligosaccharide group and its use and application in the food industry 6. Explain the groups of polysaccharides (homopolysaccharides and heteropolysaccharides) 7. Explain the structure and chemical properties of amylose starch and amylopectin		2 X 50			0%
6	Understand the chemical reactions of carbohydrates	1. Explaining Mutarotation 2. Explaining Caramelization 3. Explain Crystallization 4. Explain Starch Hydrolysis 5. Explaining Starch Modification		2 X 50			0%
7	Understand the chemical reactions of carbohydrates	1. Explaining Pari Resistance (RS) 2. Explaining Gelatinization 3. Explaining Retrogradation 4. Explaining the Maillard Reaction	**Criteria:** Declared to have mastered the indicator if the task results are more than 75% correct	Model: Cooperative Method: Discussion, assignment 2 X 50			0%
8	Master the skills for meetings 2 to 7	Meeting indicators 2 to 7	**Criteria:** It is written on the UTS sheet	Test 2 X 50			0%
9	Understand about amino acids, peptides and proteins	1. Explain the concept of amino acids (acid-base properties of amino acids) 2. Explaining Peptides (polypeptides with high DM that occur naturally) 3. Explain the classification of proteins (simple and complex proteins)		Model: Cooperative Method: Discussion and assignment 2 X 50			0%
10	Understand about amino acids, peptides and proteins	1. Explain protein structure (primary, secondary and tertiary structure) 2. Explain the bonds in proteins (peptide, disulfide, hydrogen, hydrophobic, electrostatic bonds)	**Criteria:** It is stated that you have mastered the indicator if you have completed the task more than 75% correctly	Model: Cooperative Method: Discussion and Assignment 2 X 50			0%

No							
11	Understand the structure of enzymes, properties of enzymes, factors that influence enzyme work, various types of enzymes and enzymes in food processing	1. Explain the structure of enzymes 2. Explain the properties of enzymes 3. Explain the factors that influence the work of enzymes 4. Explain the catalytic action of enzymes 5. Identifying enzymes in food processing 6. Explain the inhibition of enzyme action 7. Identify types of enzymes based on their working capacity		Model: Cooperative Method: Discussion and assignment 2 X 50			0%
12	Understanding protein in food and protein damage	1. Explain the chemistry of milk proteins 2. Explain the chemistry of cheese proteins 3. Explain the chemistry of egg protein		Model: Cooperative Method: Discussion and assignment 2 X 50			0%
13	Understanding protein in food and protein damage	1. Explain protein denaturation in food 2. Explain the Browning (Maillard) reaction in food		Model: Cooperative Method: Discussion and assignment 2 X 50			0%
14	Understand the types, composition and properties of fats/lipids in food ingredients	1. Explain the classification of lipids (simple, mixed and derivative lipids) 2. Explain fatty acids (nomenclature, saturated and unsaturated, cyclic, branched and substituted) 3. Explaining glycerides (monoglycerides, diglycerides, triglycerides) 4. Explain the components and properties of Triglycerides 5. Explain Wax, phospholipids and sterols		2 X 50			0%
15	Understand the oil and fat processing process and oil damage during the processing process	1. Explain the extraction process, 2. Explain the refining process 3. Explain the bleaching process, 4. Explain the deodorization process, 5. Explain the degumming process, 6. Explains the process of free fatty acid removal 7. Explain the damage to fats due to processing: oxidation, rancidity, hydrogenation		2 X 50			0%
16							0%

Evaluation Percentage Recap: Project Based Learning

No	Evaluation	Percentage
		0%

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** ability in the process and student learning outcomes are specific and measurable statements that identify the ability 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.