

## MODULE HANDBOOK

Module Name	Food Chemistry
Module level	Bachelor
Abbreviation, if applicable	8420402167
Sub-heading, if applicable	-
Course included in the module, if applicable	-
Semester/term	7 <sup>th</sup> /Fourth Year
Module coordinator(s)	Dr. Prima Retno Wikandari, M.Si
Lecturer(s)	Prof. Dr. Lenny Yuanita, M.Si; Mirwa Adiprahara, S.Si., M.Si
Language	Indonesian
Classification within the Curriculum	Elective Course
Teaching format/class hours per week during the semester:	2 hours lecturers (50 min per hours)
Workload:	2 x 50 minutes lectures, 2 x 60 minutes structured activity, 2 x 60 minutes individual activity, 14 weeks per semester, 79,33 total hours per semester ~ 3.18 ECTS**
Credit points:	2 CU = 2 x 1.59 = 3.18 ECTS
Prerequisite course(s):	Biochemistry (Structure and Function of Biomolecules)
Targeted learning outcomes:	<ol style="list-style-type: none"> <li>1. Students capable to demonstrate knowledge related to theoretical concepts about structure, composition, and properties of food ingredient as well as the basic principle of the chemical and physical changes of food ingredients during processing and storage.</li> <li>2. Able to apply the knowledge obtained in the field of food chemistry, and have the initiative to resolve public issues in the food sector.</li> <li>3. Applying logical, critical, systematic and innovative thinking in the context of development or implementation of food science, that regards and applies humanities in accordance with food chemistry in solving problems</li> <li>4. Capable to make decisions based on data/information in order to complete their responsibility assignment and evaluate the performance that has been done both individually and in groups, have an entrepreneurial spirit with environmental insight</li> </ol>
Content:	<p><b>Introduction</b> scope of food chemistry, food composition, structure and properties, the positive and negative effect of food processing, the types of food processing</p> <p><b>Structure and properties of food</b></p> <ol style="list-style-type: none"> <li>a. structure of amino acid, peptide and protein, amfoter, salting out, salting in, protein solubility ,swelling, gelling, foaming, emulsifier</li> <li>b. structure of mono, di and polisaccharide, dietary fiber, FOS, inuline, solubility, mutarotation, gelling, emulsifier , stabilizer, thickening, edible film</li> </ol>

	<p>c. structure saturated and unsaturated fatty acid, visible and invisible fat, saponified and unsaponified lipid (serebrosida, sfingomilein, plasmogen, ester sterol), boiling point, melting point, cristal structure, plasticity, emulsifier</p> <p><b>Functional foods:</b> bioactive peptides, short chain fatty acids, poliunsaturated fatty acids, antioxidant, FOS, inuline</p> <p><b>Changes during processing and storage</b></p> <p>a. Denaturation. , hydrolisis, cross link, maillard reaction peptide formation.</p> <p>b. autooidation, hydrogenation, trans fatty acid, ranciditas</p> <p>c. carbohidrat hydrolisis, dehidation, caramelisation, maillard, swelling</p> <p><b>Food additive</b></p> <p>a. Definition, types and function BTM</p> <p>b. Regulation</p> <p><b>Problems solving in mall nutrition and mall consumption</b></p> <p>a. Protein mall nutrition</p> <p>b. Effect of mall consumption of lipid and carbohydrate to hyperglycemia and hypercholesrerolemik</p> <p>c. Effect of trans fatty acids, free radical, autooxidation</p> <p><b>Propose a pilot project of functional food product as an entrepreneurally spirit</b></p>										
Study / exam achievements:	<p>Students are considered to complete the course and pass if they obtain at least 40% of maximum final grade. The final grade (NA) is calculated based on the following ratio:</p> <table border="1" data-bbox="624 1182 1433 1424"> <thead> <tr> <th>Assessment Components</th> <th>Percentage of contribution</th> </tr> </thead> <tbody> <tr> <td>Participation</td> <td>20%</td> </tr> <tr> <td>Assignment</td> <td>30%</td> </tr> <tr> <td>Mid-semester test</td> <td>20%</td> </tr> <tr> <td>Final semester test</td> <td>30%</td> </tr> </tbody> </table>	Assessment Components	Percentage of contribution	Participation	20%	Assignment	30%	Mid-semester test	20%	Final semester test	30%
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Mid-semester test	20%										
Final semester test	30%										
Media:	Computer, LCD, White board										
Learning Methods	Individuals assignment, group assignment, discussion, presentation.										
Literature:	<p>Belitz, H-D., Grosch,W., Schieberle, P., 2009. Food Chemistry, 4<sup>th</sup>revised and extended ed.Springer-Verlag Berlin Heidelberg</p> <p>Schaschke, C.J., 2011. Food Processing. Ventus Publishing Aps</p> <p>Fennemas, Food Chemistry 2007. 4<sup>th</sup> Edition, edited by Srinivasan Damodaran, CRC Press .</p>										
Notes:	*1 CU in learning process = three periods consist of: (a) scheduled instruction in a classroom or laboratory (50 minutes); (b) structured activity (60 minutes); and (c) individual activity (60 minutes) according to the Regulation of Indonesia Ministry of Research, Technology, and Higher										

	Education No. 44 Year 2015 jo. the Regulation of Indonesia Ministry of Research, Technology, and Higher Education No. 50 Year 2018.
	**1 CU = 1,59 ECTS according to Rector Decree Of Universitas Negeri Surabaya No. 598/Un38/Hk/Ak/2019