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**SYLLABUS:**


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**Date / Revision** 23 May 2015 / 02 May 2017 / 22 February 2018  
**Faculty** Life Sciences (LS)  
**Study Program** Food Technology (FTE)

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**SUBJECT: Food Additives**


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**1 Basic Information**

<b>1.01</b>	<b>Subject Name</b>	<b>Food Additives</b>
<b>1.02</b>	<b>Semester</b>	6
<b>1.03</b>	<b>Level</b>	1
<b>1.04</b>	<b>SKS</b>	2
<b>1.05</b>	<b>Mandatory / Curriculum</b>	D-02
<b>1.06</b>	<b>Subject Code</b>	FOAD
<b>1.07</b>	<b>Subject Code</b>	FOAD
<b>1.08</b>	<b>Year</b>	2018 (6)
<b>1.09</b>	<b>Quality Control</b>	Final Test, OFSE, see evaluation
<b>1.10</b>	<b>Limitations</b>	Min 12 and Max 32 students in one class
<b>1.11</b>	<b>Combined with</b>	None
<b>1.12</b>	<b>Pre-requisite</b>	Chemistry, Food Chemistry, Biochemistry, Organic Chemistry, Food Nutritions
<b>1.13</b>	<b>Responsible</b>	Dr. Tutun Nugraha/ Mirza Rizqi Zulkarnain, STP, MSc.
<b>1.14</b>	<b>Revision</b>	15-05-2017/22-02-2018

**2 Description of Subject**

Food additives play more important roles in today's food processing industries. This comes as one of the impacts of the more complex demand of consumers in terms of convenience and better tastes of the food products as well as the increasing demands in terms of the nutritional values and functionality of foods that are sold in the markets. Furthermore, the development of new technologies in the field of food additives are having further impact on the evolution of food processing technology. This course provides students with knowledge of various types of food additives that are currently available in the industries. The functionality as well as the properties of each of these food additives are as diverse as the types of food that are available and the diversity of the end purpose of the consumption of the food by consumers.

### 3 Objectives

In this course, students will learn the diverse types of food additives, their functions and the properties of these additives, both in terms of chemical as well as physical properties. These properties will affect how these food additives will be put into the production lines and the unique processing that may be involved with the utilization of these additives. Thus students will also learn how these additives are integrated into the food processing technology.

### 4 Competency

After taking this course students will gain understanding of the following:

- Diverse food additives used in the food industries for various purposes
- Characteristics of food additives as linked to the physical and chemical properties of the additives as well as their functionality and mode of processing/utilization in the processing
- Food additives intake assessments, their risk and benefits, also some hypersensitivity reactions related to food additives usage.
- Food additives for various end purposes: nutritional additives, flavoring agents, flavor enhancers, sweeteners, antimicrobial agents, emulsifiers, commercial starches and food phosphates.

### 5 Learning Approach / Methodology

- Lectures/ Class contact (time-tabled) supplemented with interactive questions and answers to build the projects;
- Tutorial/Laboratory/Practice Classes: preview of materials, revision and/or reports writing;
- Student Study Effort: homework/assignment; preparation for test/quizzes/ examination.
- Writing assignments/presentations

### 6 Evaluation

5.1	Absence maximum	25%
5.2	Participation in Discussion	-
5.3	Homework / Classwork	40 Points
5.4	Presentation /Simulation	-
5.5	Daily Quiz	-
5.6	Final Examination	60 Points
	<b>Total</b>	<b>100 Points</b>

## 7 Text Book and Reference

<b>1</b>	<b>Main Text Book:</b> <ul style="list-style-type: none"> <li>L. Branen, M Davidson, S Salminen, J Thorngate III, Food Additives, Marcel Dekker Inc. <b>ISBN: 0-8247-9343-9.</b></li> </ul>
<b>2</b>	<b>Supplement Textbooks:</b> <ul style="list-style-type: none"> <li>The Chemistry of Food, Jan Velisek, 2014, Wiley-blackwell, <b>ISBN: 978-1-118-38381-0</b></li> </ul>

## 8 Content / Topics of Lecture

Wee	Content/ Topics of Lecturing	Text Book	Remark
1	<b>Introduction</b> <ul style="list-style-type: none"> <li>Types of additives: preservatives, color, nutrition, flavouring, texturizing, others</li> <li>Examples products and additives</li> <li>Balancing risk and benefits</li> <li>Legal and regulations</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 1	1 x 2 x 50 minutes
2	<b>Food Additives intake assessments</b> <ul style="list-style-type: none"> <li>Scope and purpose of food additive intake assessment</li> <li>Regulation of maximum levels of food additive</li> <li>Food consumption data: food balance sheets, household surveys, nutrition surveys, the use of food consumption data in food additive intake studies</li> <li>Excessive food additive intakes and population risk groups</li> <li>Variation in food additive intakes</li> <li>Disseminating information to consumers</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 2	1 x 2 x 50 minutes
3	<b>Risks and benefits of food additives</b> <ul style="list-style-type: none"> <li>Functions of food additives</li> <li>Usage of food additives</li> <li>Regulations and monitoring</li> <li>Risk and benefits assessment, categorizing and balancing</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 3	1 x 2 x 50 minutes
4	<b>Food additives and hypersensitivity</b> <ul style="list-style-type: none"> <li>Definitions and Prevalence of Hypersensitivity Reactions</li> <li>Mechanisms</li> <li>Reactions in the Skin</li> <li>Reactions in the Airways</li> <li>Other Reactions</li> <li>Test for Hypersensitivity Reactions</li> <li>Prediction of Allergy Risk</li> <li>Development of Tolerance and Treatment of Hypersensitivity</li> <li>Summary</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 4	1 x 2 x 50 minutes

5	<p><b>Nutritional additives</b></p> <ul style="list-style-type: none"> <li>• Vitamins: Vit A, Vit B (B6, B12), Vit C, Vit D, Vit E, Vit K, Thiamin, Riboflavin, Niacin, Pantothenic acid, Folate, Cholin, Carnitin, Inositol, Amino Acids, Fatty Acids</li> <li>• Minerals &amp; trace minerals: Ca, P, Mg, K, Na, Cl, Fe, Zn, Cu, I, Mn, dietary supplements</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 9	1 x 2 x 50 minutes
6	<p><b>Flavoring agents</b></p> <ul style="list-style-type: none"> <li>• History</li> <li>• Flavour: nature, creation and production</li> <li>• Functions of flavour</li> <li>• Applications of flavor</li> <li>• Regulations &amp; safety</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 13	1 x 2 x 50 minutes
7	<p><b>Flavor enhancer</b></p> <ul style="list-style-type: none"> <li>• Chemical properties</li> <li>• Functions in foods</li> <li>• Glutamate in foods</li> <li>• Biochemicals &amp; Toxicology</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 14	1 x 2 x 50 minutes
8	<b>MIDTERM SEMESTER BREAK</b>		
9	<p><b>Sweeteners</b></p> <ul style="list-style-type: none"> <li>• Non-nutritive sweeteners: sacharine, cyclamates, aspartame, acesulfame K, thaumatin, sucralose</li> <li>• Nutritive Sweeteners: fructose, xylitol, sorbitol, manitol, lactitol, lactulose, hydrogenated glucose syrup, malitol, isomalt, fructose syrup, fructose syrup</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 15	1 x 2 x 50 minutes
10, 11	<p><b>Antimicrobial Agents</b></p> <ul style="list-style-type: none"> <li>• Dimethyl Dicarbonates</li> <li>• Lysozyme</li> <li>• Natamycins</li> <li>• Nisin</li> <li>• Nitrites</li> <li>• Organic Acids</li> <li>• Parabens</li> <li>• Phosphates</li> <li>• Sulfites</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 20	2 x 2 x 50 minutes
12	<p><b>Emulsifiers</b></p> <ul style="list-style-type: none"> <li>• Emulsifier Chemistry</li> <li>• Emulsifier Function and Mechanism</li> <li>• Applications in Foods</li> <li>• Toxicology and Worldwide Regulations Concerning Use</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 23	1 x 2 x 50 minutes
13	<p><b>A Comprehensive Review of Commercial Starches and Their Potential in Foods</b></p> <ul style="list-style-type: none"> <li>• Starch Sources, Structures, Characteristics and Properties</li> <li>• Chemical and Physical Modification of Starch</li> <li>• Food Applications for Native and Modified Starch</li> <li>• A Starch Selection</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 24	1 x 2 x 50 minutes

14	<b>Food Phosphates</b> <ul style="list-style-type: none"> <li>• Phosphates Chemistry Relevant to Foods</li> <li>• Uses and Applications of Food Grade Phosphates</li> <li>• Nutritional Effects</li> </ul>	Branen, Davidson, Salminen, Thorngate, Chapter 25	1 x 2 x 50 minutes
15	<b>Review/Evaluation</b>		1 x 2 x 50 minutes
16, 17	<b>Final Examination</b>		