



## Course Specifications

<b>Course Title:</b>	<b>Chemistry of Food Components</b>
<b>Course Code:</b>	<b>2062203-3</b>
<b>Program:</b>	<b>Bachelor in Food Science and Nutrition</b>
<b>Department:</b>	<b>Food Sciences and Nutrition Department</b>
<b>College:</b>	<b>College of Science</b>
<b>Institution:</b>	<b>Taif University</b>

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## A. Course Identification

<b>1. Credit hours:</b> 3 Hours
<b>2. Course type</b>
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
<b>3. Level/year at which this course is offered:</b> 4 <sup>th</sup> Level/2 <sup>nd</sup> year
<b>4. Pre-requisites for this course (if any):</b> None
<b>5. Co-requisites for this course (if any):</b> None

### 6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	Traditional classroom	√	100%
2	Blended	---	---
3	E-learning	---	---
4	Distance learning	---	---
5	Other		

### 7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	---
4	Others (specify)	---
	<b>Total</b>	<b>60</b>

## B. Course Objectives and Learning Outcomes

### 1. Course Description

Introduction to food chemistry- water characteristics and importance in food systems – Carbohydrate (classification and structure)- Lipids (classification and nomenclature) – protein classification, structure and function – Enzyme (characteristics and structure) – food additives (colorants, preservative and flavorings agents) – vitamins ( structure and properties).

### 2. Course Main Objective

- Recognize the chemical characteristics of major and minor food components and its effect in food quality.
- Show the chemical structure and functions of food component in food systems.
- Explain the chemical interactions between food components during food processing and storage.

### 3. Course Learning Outcomes

CLOs		Aligned PLOs
1	<b>Knowledge and understanding</b>	
1.1	Recognize the structure and characteristics of major and minor food components	<b>K3</b>
1.2	Memorize the biochemical interaction between food components during food processing and storage	<b>K3</b>
1.3	Outline the basis and concepts of the biochemical and physical causes of alterations in food components	<b>K4</b>

CLOs		Aligned PLOs
<b>2</b>	<b>Skills:</b>	
2.1	Expect and solve the problems resulted from chemical interaction between food components during food processing and storage.	<b>S4</b>
2.2	Evaluate the role of food constituents in increasing the food quality and shelf life	<b>S1</b>
<b>3</b>	<b>Values:</b>	
3.1	Participate to work in groups and teamwork	<b>V1</b>
3.2	Support both oral and written excellence for data presentation and explanation of food chemistry related issues.	<b>V3</b>

### C. Course Content:

No	List of Topics	Contact Hours
1	Introduction to food chemistry	3
2	Water importance in food chemistry- The properties of water as solvent in food systems.	3
3	Simple sugars and other carbohydrates- Carbohydrate classification, nomenclature and reactions.	3
4	Polysaccharides major types of starch - The process of starch gelatinization. Modified starches and other polysaccharides used in foods.	3
5	Lipids: Lipid classification and nomenclature - Reactions of lipids (hydrogenation, oxidation).	3
6	Lipids as emulsifier -Proteins- Amino acid nomenclature.	3
7	Amino acid and protein interaction. External factors that influence protein systems in foods.	3
8	Enzymes: Classes of enzymes and enzyme kinetics - The role of the enzyme in food processing and food System	3
9	Food colorants and additives - Natural and synthetic pigments	3
10	Vitamins in food: Water soluble vitamins- Fat soluble vitamins	3
<b>Total</b>		<b>30</b>
<b>Experimental Topics</b>		
1	*Preparation of Molar and Normal solution.	3
2	The properties of water as solvent in food systems * Water properties and water activity.	3
3	*Qualitative tests for individual sugars. * Qualitative analysis of carbohydrates.	3
4	* Starch properties *Polysaccharide properties	3
5	* Physical analysis of lipids * Lipids chemical characteristics	3
6	* Qualitative analysis of amino acids	3
7	* Qualitative analysis of proteins * Functional properties of protein	3
8	* Enzymes properties.	3
9	* Food pigments characteristics.	3
10	* Water soluble vitamins criteria * Fat soluble vitamin criteria.	3
<b>Total</b>		<b>30</b>

## D. Teaching and Assessment

### 1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
<b>1.0</b>	<b>Knowledge and understanding</b>		
1.1	Recognize the structure and characteristics of major and minor food components	Lecture.	Written exam
1.2	Memorize the biochemical interaction between food components during food processing and storage	Lecture - Practical demonstrations	Written exam - Practical exam
1.3	Outline the basis and concepts of the biochemical and physical causes of alterations in food components	Lecture	Written exam
<b>2.0</b>	<b>Skills</b>		
2.1	Expect and solve the problems resulted from chemical interaction between food components during food processing and storage.	Write a short search	Written exam Report evaluation
2.2	Explain the role of food constituents in increasing the food quality and shelf life	Lecture - Practical demonstrations	Written exam Practical exam
<b>3.0</b>	<b>Values</b>		
3.1	Participate to work in groups and teamwork	Practical lessons	Practical exam
3.2	Support both oral and written excellence for data presentation and explanation of food chemistry related issues.	Practical experiments	Report evaluation

### 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignment and Interaction during lectures	Continues	10%
2	Midterm exam	5-6	20%
3	Weekly Lab. Reports	Continues	20%
4	Practical exam	11	10%
5	Final exam	12	40%

\*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

## E. Student Academic Counseling and Support

### Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- There are 6 h per week for this purpose and the students know these hours according to the time of professor who teach the course.
- Student satisfaction surveys are conducted for academic guidance.
- Develop an improvement plan for academic guidance based on the results of the questionnaire analysis.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	1. Food Chemistry: Principles and Applications ,3 rd Edition. 2012. Y.H.Hui Ed., Science Technology System, Sacramento, CA.ISBN 9781891796081 . 2. Food: The Chemistry of Its Components, T. P. Coultate , Fourth Edition, 2002, Royal Society of Chemistry. 3. Fennema's Food Chemistry, Fourth Edition, Owen R. Fennema et al., 2008, Royal Society of Chemistry.
<b>Essential References Materials</b>	- Journal of food science - Journal of Food Chemistry - Journal of Food Biochemistry - Chemistry of Food Analysis " Principles and Applications ", Prof. Dr. Mohamed Amen Abdulla-2002.

	- Food Chemistry, Damascus, Syria- 2010
<b>Electronic Materials</b>	1. Sciencedirect.com 2. PubMed. 3. Springer. <a href="https://www.nature.com/subjects/analytical_chemistry">https://www.nature.com/subjects/analytical_chemistry</a> <a href="https://www.royalsocietyofchemistry.org/">https://www.royalsocietyofchemistry.org/</a>
<b>Other Learning Materials</b>	<a href="http://www.britannica.com/EBchecked/topic/183000/electrochemicalanalysis">www.britannica.com/EBchecked/topic/183000/electrochemicalanalysis</a> <a href="http://www.chm.davidson.edu/vce/Spectrophotometry/index.html">www.chm.davidson.edu/vce/Spectrophotometry/index.html</a> <a href="http://www.fao.org">www.fao.org</a> – <a href="http://www.nutrition.org">www.nutrition.org</a> - <a href="http://www.sciencedirect">www.sciencedirect</a>

## 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	1) One Lecture Hall with comfortable seats (about 50 m <sup>2</sup> ) for 3 hours a week 2) One laboratory for 3 hours a week with internet facility.
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	Data show and Black Board
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	Chemical, reagents, indicators and lab. Tools (i.e. pipets, different Pyrex flasks, cylinders, filter paper,...etc)

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students, faculty, program leaders and Peer Reviewer	<ul style="list-style-type: none"> <li>• Continuous monitoring by directors of program and quality assurance unit (Direct).</li> <li>• Applying Questionnaires received from the Deanship of Academic Development for Student evaluation (indirect).</li> <li>• Evaluation of course report (indirect).</li> </ul>
Extent of achievement of course learning outcomes	Students, faculty, program leaders and Peer Reviewer	<ul style="list-style-type: none"> <li>• Applying Questionnaires for Student evaluation (indirect).</li> <li>• Evaluation of course report (indirect).</li> </ul>
Quality of learning resources	Faculty, program leaders, administrative staff, independent reviewers.	<ul style="list-style-type: none"> <li>• Continuous monitoring by directors of program and quality assurance unit (Direct).</li> <li>• Applying Questionnaires for Student evaluation (indirect).</li> <li>• Evaluation of course report (indirect).</li> </ul>

**Evaluation areas** (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)

**Evaluators** (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify))

**Assessment Methods** (Direct, Indirect)

## H. Specification Approval Data

<b>Council / Committee</b>	<b>Department council - Academic Development Committee</b>	
<b>Reference No.</b>	<b>Department council NO: 2</b>	<b>Subject NO: 1</b>
<b>Date</b>	<b>30 /02 /1444 H</b>	