



## Course Specifications

<b>Course Title:</b>	<b>Recycling of Food Industry Wastes</b>
<b>Course Code:</b>	<b>2064201-2</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> 2 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> 11 <sup>th</sup> Level / 4 <sup>nd</sup> year
<b>4. Pre-requisites for this course (if any):</b> Fruit and Vegetables Industry Technology 2064104-3
<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	Correspondence	---	---
5	Other	---	---

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

No	Activity	Contact Hours
1	Lecture	30
2	Laboratory/Studio	---
3	Tutorial	10
4	Others (specify)	---
	<b>Total</b>	<b>40</b>

## B. Course Objectives and Learning Outcomes

### 1. Course Description:

This course deals with recognition of the wastes resulted from food processing factories and their chemical and microbiological properties and the possibility of their use for production of economically and nutritionally valuable products-Properties and applications of fruits and vegetables industry wastes- Properties and applications of fish industry wastes- Properties and applications of flourmills wastes- Properties and applications of sugar industry wastes- Properties and applications of dairy industry wastes.

### 2 Course Main Objective:

- List the techniques of treatment of different types of wastes.
- Summarize the biogenic raw material produced from recycling of food industrial wastes.

### 3. Course Learning Outcomes:

CLOs		Aligned-PLOs
1	<b>Knowledge and understanding</b>	
1.1	Identify the economic importance and chemical constituents of food industrial wastes.	<b>K3</b>
1.2	Recognize the environmental aspects of food industrial wastes and their treatment.	<b>K2</b>
2	<b>Skills:</b>	

CLOs		Aligned-PLOs
2.1	Classify the food industrial wastes into the different categories.	S1
2.2	Design waste treatment techniques offering non-traditional source of raw material in food industry.	S1
<b>3</b>	<b>Values:</b>	
3.1	Represent ethical attitude in accordance with the highest ethical standards in public attitudes and personal	V1
3.2	Participate effectively in the team work	V1

### C. Course Content

No	List of Topics	Contact Hours
1	<b>Section 1:</b> <b>Introduction: Classification and characterization of food industrial wastes.</b> <ul style="list-style-type: none"> <li>• Definition, origin and type of food industrial wastes.</li> <li>• Needs for waste treatment: economic and environmental aspects.</li> <li>• Classification, composition and characterization of food industrial wastes.</li> <li>• Food industrial wastes as source of biogenic raw material and energetic utilization.</li> </ul>	6
2	<b>Section 2:</b> <b>Food Wastes Related to Specific Processing Industries:</b> <ul style="list-style-type: none"> <li>• Agricultural wastes</li> <li>• Wastes from fruit and vegetable processing industries.</li> <li>• Wastes from fish industries</li> <li>• Wastes from meat and poultry industries.</li> <li>• Wastes from sugar industries.</li> <li>• Wastes from dairy industries.</li> </ul>	12
3	<b>Section3:</b> <b>Waste disposal methods:</b> <ul style="list-style-type: none"> <li>• Methods of waste treatment: physical, chemical and biological.</li> <li>• Primary treatments: screening, sedimentation, skimming, floatation coagulation and flocculation, filtration, adsorption, chemical oxidation, membrane separation, ion exchange.</li> <li>• Treatment methods for liquid wastes.</li> <li>• Treatment methods of solid wastes.</li> </ul>	6
4	<b>Section4:</b> <b>Brief Case Studies:</b> <ul style="list-style-type: none"> <li>• Utilization of specific plant by-products for recovery of proteins, pectin, dietary fibers, antioxidants and colorants</li> </ul>	6
<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
1.0	<b>Knowledge and understanding</b>		
1.1	Identify the economic importance and food constituents of food industrial wastes.	Lecture	Written exam

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.2	Recognize the environmental aspects of food industrial wastes and their treatment.	Lecture	Written exam
<b>2.0</b>	<b>Skills</b>		
2.1	Classify food industrial wastes into the different categories.	Discussion	Written exam
2.2	Design waste treatment techniques offering non-traditional source of raw material in food industry.	Discussion	Oral evaluation
<b>3.0</b>	<b>Values</b>		
3.1	Represent ethical attitude in accordance with the highest ethical standards in public attitudes and personal	Group discussion	Evaluation the positive discussion from students
3.2	Adapt with computer and the internet facilities to collect the new information in this field.	Cooperative learning	Evaluation the presentation of each group

## 2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	Assignments, term paper, oral presentations, and interaction during lectures.	Continues	10%
2	Midterm exam	5-6	30%
3	Periodical short exams	8	10%
4	Final exam	12	50%

\*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.

## F. Learning Resources and Facilities

### 1. Learning Resources

<b>Required Textbooks</b>	- Recycling. - Environmental Science & Technology
<b>Essential References Materials</b>	- <a href="#">International Journal of Recycling of Organic Waste in Agriculture</a> - <a href="#">Resources, Conservation and Recycling</a> - Bio-cycle.
<b>Electronic Materials</b>	- <a href="https://www.recyclenow.com/recycling-knowledge/how-is-it-recycled/food-waste">https://www.recyclenow.com/recycling-knowledge/how-is-it-recycled/food-waste</a> - <a href="https://www.foodwastenetwork.org.uk/">https://www.foodwastenetwork.org.uk/</a>
<b>Other Learning Materials</b>	None

## 2. Facilities Required

Item	Resources
<b>Accommodation</b> (Classrooms, laboratories, demonstration rooms/labs, etc.)	- One Lecture hall with comfortable 60 seats (about 50 m <sup>2</sup> ).
<b>Technology Resources</b> (AV, data show, Smart Board, software, etc.)	- Data show and Smart board
<b>Other Resources</b> (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	- None

## G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Course evaluation by students organized every semester.	- Students	- Direct - Indirect
Learning resources	- Program Leaders - Staff Member - Students	- Indirect
Effectiveness of teaching and assessment	- Students	- Indirect

**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:

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