



**Utilization of Agro-industrial
By-products and Waste
Syllabus**

GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
DEPARTMENT	FOOD SCIENCE & NUTRITION		
PROGRAMME	UNDERGRADUATE		
COURSE CODE	ME914	SEMESTER	I
COURSE	Utilization of Agro-industrial By-products and Waste RESPONSIBLE: D. MAKRIS		
TEACHING ACTIVITIES		TEACHING HOURS PER WEEK	CREDIT UNITS
		LECTURES	3
		LABORATORY	3
COURSE TYPE	SCIENTIFIC AREA/SPECIFIC BACKGROUND/ SKILL DEVELOPMENT		
PREREQUISITES:	NO		
TEACHING AND EXAM LANGUAGE:	GREEK		
COURSE OFFERED TO ERASMUS STUDENTS	NO		
COURSE SITE (URL)			

LEARNING OUTCOME

Learning outcome



The objective of the course is the provision of knowledge pertaining to policies and scientific methods of management and valorisation of agri-food industry by-products and wastes. Particular emphasis is given in the avoidance of by-product/waste dumping generated during food processing and consumption, with the aim of reducing environmental aggravation. Furthermore, strategies and valorisation methodologies are also dealt with, to present routes of producing mainly high value-added products. Laboratory exercises intent to accustom students with practices related with agri-food by-product/waste valorisation as a strategy to produce high value-added products.

Upon successful completion of the course, students will be able to:

- *Have basic knowledge related with circular economy and associated domestic and international strategies*
- *Have knowledge on of the nature of agri-food wastes*
- *Have knowledge on avoidance/recycling/reuse of agri-food wastes.*
- *Have spherical knowledge on agri-food waste processing.*
- *Have spherical knowledge on on agri-food waste valorisation methods*

General skills

Upon completion of the course, the students will acquire the following skills:

- *Critical thinking and the link between theory and practical applications*
- *Search, analysis and combination of data and information with the use of cutting edge technologies*
- *Decision making*
- *Self-sufficient working*
- *Team working*
- *Advancement of free, creative and inferential thinking*
- *Development of connotative and divergent thinking*

Syllabus

1st week: Waste management and sustainability in the food industry
2nd week: Biorefining – basic principles
3rd week: Valorisation of food processing wastes
4th week: Enzymes, proteins and peptides
5th week: Polysaccharides
6th week: Lipid-soluble pigments and antioxidants
7th week: Water-soluble pigments and antioxidants
8th week: Fermentation technology
9th week: Production of alcohols and organic acids
10th week: Production of microbial lipids
11th week: Citrus processing wastes
12th week: Winemaking wastes
13th week: Olive oil production and cereal processing wastes

Laboratory course: 1. Introduction 2. Determination of sugar content in grape must residues with the phenol-sulfuric acid method. Calculation of potential alcoholic strength 3. Determination of total polyphenols in olive leaves (Folin-Ciocalteu) – Effect of solvent extraction. 4. Estimation of the reducing power of extracts (FRAP method) 5. Anthocyanin determination in fruit processing by-products. 6. Determination of total carotenoids in tomato processing by-products 7. Determination of total proteins in whey (Bradford method). 8. Overview – summary



TEACHING AND LEARNING METHODS - EVALUATION

TEACHING MODE	On campus. In laboratory courses, following a short demonstration by the teaching staff, students carry out the experiment. Furthermore, students get accustomed to writing of scientific reports, in which the experimental data are appropriately given and discussed.		
USE OF COMPUTER SERVICES	Lectures are delivered by power point presentations and other audio media		
TEACHING ORGANISATION	<i>Activity</i>	<i>Semester workload</i>	
	Lecture course	39	
	Laboratory course	39	
	Study	47	
	Sum	125	
STUDENT EVALUATION	The language of evaluation is Greek. The final grade is 50% the grade of the lecture course and 50% of the laboratory course. The exams of the lecture course include multiple choice questions. The exams of the laboratory course include exercises (50%) and reports (50%).		

RECOMMENDED BIBLIOGRAPHY

Gekas B., Balta-Brouma K.P. (2005). Food Industry & Environment. Tziola Eds. [ISBN: 960-418-057-6]