

## COURSE OUTLINE

### (1) GENERAL

<b>SCHOOL</b>	Agricultural Sciences		
<b>ACADEMIC UNIT</b>	AGRICULTURE		
<b>LEVEL OF STUDIES</b>	Undergraduate		
<b>COURSE CODE</b>	AGRI EX7	<b>SEMESTER</b>	7 <sup>th</sup> or 9 <sup>th</sup>
<b>COURSE TITLE</b>	<b>VALORISATION OF AGRICULTURAL RESIDUAL BIOMASS</b>		
<b>INDEPENDENT TEACHING ACTIVITIES</b> <i>if credits are awarded for separate components of the course, e.g. lectures, laboratory exercises, etc. If the credits are awarded for the whole of the course, give the weekly teaching hours and the total credits</i>	<b>WEEKLY TEACHING HOURS</b>	<b>CREDITS</b>	
<b>Lectures</b>	2		
<b>Tutorials</b>	2		
Laboratory	0		
<b>TOTAL</b>	<b>4</b>	<b>5</b>	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
<b>COURSE TYPE</b> <i>general background, special background, specialised general knowledge, skills development</i>	specialised general knowledge,		
<b>PREREQUISITE COURSES:</b>	There are no prerequisite courses. However, students must have basic knowledge of General and Inorganic Chemistry, Organic Chemistry, Agricultural Physical Chemistry Arboriculture and Weedology		
<b>LANGUAGE OF INSTRUCTION and EXAMINATIONS:</b>	Greek .-For Erasmus students in English		
<b>IS THE COURSE OFFERED TO ERASMUS STUDENTS</b>	Yes		
<b>COURSE WEBSITE (URL)</b>	<a href="https://eclass.upatras.gr/courses/">https://eclass.upatras.gr/courses/</a>		

### (2) LEARNING OUTCOMES

#### Learning outcomes

*The course learning outcomes, specific knowledge, skills and competences of an appropriate level, which the students will acquire with the successful completion of the course are described.*

*Consult Appendix A*

- *Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area*
- *Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B*
- *Guidelines for writing Learning Outcomes*

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

- Consider residual biomass as a viable source of income
- To know basic methods of utilization of residual biomass.
- To know products that can be produced from its utilization
- To combine knowledge from other fields with the aim of the best and most economical utilization of redundant biomass.
- To evaluate the quality and effectiveness of the produced products
- Search, gather, analyze and evaluate bibliographic data
- To design methods for the small scale utilization of agricultural residues for the production of plant protection products, soil improvers, animal feed, adsorbents, biofuels

• To adapt the exploitation methods to the physical and economic geography of the place

**General Competences**

Taking into consideration the general competences that the degree-holder must acquire (as these appear in the Diploma Supplement and appear below), at which of the following does the course aim?

- |   |   |
|---|---|
| <i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i> | <i>Project planning and management</i>  |
| <i>Adapting to new situations</i>   | <i>Respect for difference and multiculturalism</i>  |
| <i>Decision-making</i>  | <i>Respect for the natural environment</i>  |
| <i>Working independently</i>  | <i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i> |
| <i>Team work</i>  | <i>Criticism and self-criticism</i>   |
| <i>Working in an international environment</i>  | <i>Production of free, creative and inductive thinking</i>                                      |
| <i>Working in an interdisciplinary environment</i>  | <i>.....</i>  |
| <i>Production of new research ideas</i>   | <i>Others...</i>  |
|   | <i>.....</i>  |

At the end of this course the student will have further developed the following general skills:  
*Search, analysis and synthesis of data and information, also using the necessary technologies*  
*Adaptation to new situations*  
*Decision making*  
*Autonomous work*  
*Teamwork*  
*Generating new research ideas*  
*Respect for the natural environment*  
*Exercise criticism and self-criticism*  
*Promotion of free, creative and inductive thinking*

**(3) SYLLABUS**

1. 1 Introduction. Presentation of the thematic units of the course
2. Extraction methods for the production of vitamin preparations and biofuels
3. Residual biomass: Weeds, wild vegetation, nettle, equisetum
4. Residual biomass: Residues from olive pruning and olive leaves during olive collection
5. Residual biomass of canning and juice making.
6. Residual biomass from pits and skins of fruits and nuts.
7. Production of vitamin herbal preparations for human use: Methods and control.
8. Production of herbal preparations with phytoprotective action: Production and application methods.
9. Production of biofuels using primary material and/or extraction residues
10. Collection of wild olive leaves from the area and extraction (percolation) to produce value-added products
11. Methods of production of aromatic extracts/distillates
12. Methods of production of adsorbents
13. Integrated processes.

**(4) TEACHING and LEARNING METHODS - EVALUATION**

<b>DELIVERY</b> <i>Face-to-face, Distance learning, etc.</i>	Face to face deliveries.
<b>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</b> <i>Use of ICT in teaching, laboratory education, communication with students</i>	<ul style="list-style-type: none"> <li>• Use of ICT (power point) in Teaching</li> <li>• Video presentation</li> <li>• Collection of biomass from the surrounding area and presentation of forms of its utilization</li> <li>• Use of ICT in Communication with students (Learning process)</li> </ul>

	support through the electronic platform e-class).	
<p><b>TEACHING METHODS</b> The manner and methods of teaching are described in detail. Lectures, seminars, laboratory practice, fieldwork, study and analysis of bibliography, tutorials, placements, clinical practice, art workshop, interactive teaching, educational visits, project, essay writing, artistic creativity, etc. The student's study hours for each learning activity are given as well as the hours of non directed study according to the principles of the ECTS</p>	<b>Activity</b>	<b>Semester workload</b>
	Lectures	26
	Tutorials	26
	Study and literature survey	20
	Exams and small projects	20
	Unguided study	33
	Course total	<b>125</b>
<p><b>STUDENT PERFORMANCE EVALUATION</b> Description of the evaluation procedure Language of evaluation, methods of evaluation, summative or conclusive, multiple choice questionnaires, short-answer questions, open-ended questions, problem solving, written work, essay/report, oral examination, public presentation, laboratory work, clinical examination of patient, art interpretation, other Specifically-defined evaluation criteria are given, and if and where they are accessible to students. 1</p>	<p>1. The main assessment criteria focus on understanding and correlating the knowledge that students gain from the course with knowledge from other courses. The evaluation is continuous and dynamic. It mainly includes short project work, solving problems or answering open questions. Exams are conducted orally or in writing or a combination of the two, with or without pre-examination of the key topics of the course, with or without progressions and by other inventive methods, depending on the dynamics and the needs of the audience</p>	

### (5) RECOMMENDED LITERATURE in Greek

- ΔΙΑΧΕΙΡΙΣΗ ΟΡΓΑΝΙΚΩΝ ΑΠΟΒΛΗΤΩΝ ΜΕ ΚΟΜΠΟΣΤΟΠΟΙΗΣΗ ΚΑΙ ΕΠΙΛΟΓΗ ΚΑΤΑΛΛΗΛΩΝ ΔΟΜΙΚΩΝ ΥΛΙΚΩΝ  
[https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwish\\_k2rv9AhUhYPEDHeanC34QFnoECAIQAAQ&url=http%3A%2F%2Fikee.lib.auth.gr%2Frecord%2F297593%2Ffiles%2FGRI-2018-21426.pdf&usq=AOvVaw2ixbtg6sfQIcO0mEqyMVft](https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwish_k2rv9AhUhYPEDHeanC34QFnoECAIQAAQ&url=http%3A%2F%2Fikee.lib.auth.gr%2Frecord%2F297593%2Ffiles%2FGRI-2018-21426.pdf&usq=AOvVaw2ixbtg6sfQIcO0mEqyMVft)
  - Papadaki M. (2020) Waste biomass suitable as feedstock for biofuels production. John Wiley & Sons Ltd. (Chapter 2).
- Scientific Journals**
- Antioxidants
  - Journal of Natural Medicines (<https://www.springer.com/journal/11418>)
  - Natural Medicine Journal
  - Biofuels
  - Materials: Special Issue "Adsorbents and Their Applications"  
[https://www.mdpi.com/journal/materials/special\\_issues/sorbent\\_sorption](https://www.mdpi.com/journal/materials/special_issues/sorbent_sorption)