UNIVERSITATEA DE ŞTIINŢE AGRICOLE ŞI MEDICINĂ VETERINARĂ CLUJ-NAPOCA
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**No_____from _____** **Form code USAMV–CN-0706010210**

# SUBJECT OUTLINE

## 1. Information on the programme

| | |
|---|---|
| 1.1. Higher Education Institution | University of Agricultural Sciences and Veterinary-Medicine Cluj-Napoca |
| 1.2. Faculty | Food Science and Technology |
| 1.3. Department | Food Science |
| 1.4. Study field | Food Science |
| 1.5. Level field[1)] | Master |
| 1.6. Specialization/ Study Program | Food Safety and Consumer Protection |
| 1.7. Form of education | Full time |

## 2. Information on the discipline

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 2.1. Name of the course | **Food waste exploitation** | | | | | | | |
| 2.2. Course leader | **Prof. PhD Sonia Socaci, Lecturer PhD Anca Fărcaș** | | | | | | | |
| 2.3. Coordinator of seminary/laboratory activity/project | **Lecturer PhD Anca Fărcaș** | | | | | | | |
| 2.4. Year of study | **I** | 2.5. Semester | **II** | 2.6. Type of evaluation | Summative | 2.7. Course regime | Content[2] | DD |
| | | | | | | | Level of compulsory[3] | DO |

## 3. Total estimated time (teaching hours per semester)

| | | | | | |
|---|---|---|---|---|---|
| **3.1. Number of hours/week – frequency form** | 4 | of which : 3.2. course | 2 | 3.3. seminary/ laboratory/ project | 2 |
| **3.4. Total hours in the curricula** | 56 | of which: 3.5.course | 28 | 3.6.seminary/laboratory | 28 |
| **Distribution of time** | | | | | Hours |
| **3.4.1.. Study based on handbook, notes, bibliography** | | | | | 30 |
| **3.4.2. Extra documentation in the library, on specific electronic platforms and on field** | | | | | 12 |
| **3.4.3. Preparation of seminaries/ laboratories/ projects, themes, papers, portfolies and essays** | | | | | 30 |
| **3.4.4.Tutorial** | | | | | 22 |
| **3.4.5. Examination** | | | | | 20 |
| **3.4.6. Other activities** | | | | | 5 |
| **3.7. Total hours of individual study** | 119 | | | | |
| **3.8. Total hours per semester** | 175 | | | | |
| **3.9. Number of ECTS[4]** | 7 | | | | |

## 4. Prerequisites (if applicable)

| | |
|---|---|
| 4.1. of curriculum | Food chemistry, food control and safety |
| 4.2. of competences | Identification, description and appropriate use of specific concepts of food science and food safety |

## 5. Conditions (if applicable)

| | |
|---|---|
| 5.1. of course development | Projector, ppt presentation |
| 5.2. of seminary/laboratory/ project development | Laboratory with appropriate analytical equipment, glassware, consumables |

**6. Specific competences acquired**

| | |
|---|---|
| Professional competences | C4.1. Identification and use of scientific research methods in the field of agri-food sciences<br>C 4.2. An integrated approach to food science and technology from a social, economic, ethical and cultural point of view<br>C4.4. Use of evaluation criteria and methods for optimizing agri-food processes |
| Transversal competences | CT1<br>Realization of complex, interdisciplinary, individual projects<br>CT2<br>Realization of complex, interdisciplinary projects, with the coordination of a team |

**7. Subject objectives** (as a result of the specific acquired competences)

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|---|---|
| 7.1. Subject general objectives | Arguing the need to re-evaluate the potential of food waste and by-products to be exploited in the food industry in order to achieve the goal of "zero waste" |
| 7.2. Specific objectives | Highlighting the importance of waste and by-products in the food industry as a source of bioactive compounds; methods of extraction and purification of bioactive compounds; how to exploit the recovered compounds; development/design of added-value products |

**8. Contents**

| **8.1.COURSE**<br>**Number of hours – 28** | Teaching methods | Notes (1 lecture = 2 hours) |
|---|---|---|
| Introductory notions - terminology, sources of waste and by-products, management and recovery strategies, sustainability of the agri-food industry | Lecture, heuristic conversation, debate, algorithmic, case study, directed observation | 2lectures |
| Classification of target compounds - bioactive compounds from cereals, fruits and vegetables, roots and tubers, oilseeds, dairy by-products | | 3lectures |
| Universal strategies for the recovery of bioactive compounds | | 2 lectures |
| Conventional methods of extraction and purification of micro- and macro-molecules | | 2 lectures |
| Modern methods of extraction and purification of micro- and macro-molecules | | 2 lectures |
| Applications of recovered bioactive compounds in the development of value-added products | | 3 lectures |

| **8.2. PRACTICAL WORK**<br>**Number of hours – 28** | | 1 lab work (2 hours / work) |
|---|---|---|
| Case studies - evaluation of the possibility of capitalization of the main wastes and agri-food by-products. | Conversation, argumentation, debate | 3 labs |
| Case studies - extraction and purification of bioactive compounds from waste and agri-food by-products. | Debate, algorithmic, case study, heuristic conversation | 3 labs |
| Case studies - characterization of bioactive compounds recovered from waste and agri-food by-products | Learning by discovery, debate, case study, conversation, argumentation | 3 labs |
| Case study - design of value-added products based on recovered bioactive compounds | | 2 labs |
| | | 2 labs |

| | | |
|---|---|---|
| Case study - characterization of products developed based on recovered bioactive compounds<br>Knowledge verification colloquium | | 1 lab |

*Compulsory Bibliography:*

1. Galanakis C., Food waste recovery – processing technologies and industrial techniques, Academic Press Elsevier, 2015
2. Sonia A. Socaci et al., 2017, Antioxidant compounds recovered from food wastes, in Functional Food – Improve Health through Adequate Food, Intech, Croația, ISBN 978-953-51-3440-4, p. 3-21, DOI: 10.5772/intechopen.69124
3. Anca C. Fărcaş et al., 2017, Exploitation of Brewing Industry Wastes to Produce Functional Ingredients, în Brewing Technology, Intech, Croația, ISBN 978-953-51-3342-1, p. 138-156, DOI: 10.5772/intechopen.69231
4. Socaci Sonia A., et al., 2017, Food Wastes as Valuable Sources of Bioactive Compounds, în Functional Food-Development of Superfood and its Role in Medicine, Intech, Croația, ISBN 978-953-51-2942-4, Print ISBN 978-953-51-2941-7, p 75-93, DOI: http://dx.doi.org/10.5772/66115

*Facultative Bibliography:*

1. Waldron K., Handbook of food waste management and co-product recovery in food processing, volume 1, Woodhead Publishing, 2007.
2. Waldron K., Handbook of food waste management and co-product recovery in food processing, volume 2, Woodhead Publishing, 2009
3. A. Fărcaş, Sonia A. Socaci, Zoriţa Diaconeasa, 2020, Introductory Chapter: From Waste to New Resources în Food Preservation and Waste Exploitation, Intech, Croația, ISBN: 978-1-78985-426-8, DOI: 10.5772/intechopen.89442

**9. Correlations between the subject against the expectations of the epistemic community representatives, of the professional associations and employers' representatives in the domain**

Course content is congruent with the applications of professional national specific companies.
In order to identify ways of modernization and continuous improvement of teaching and course content with the current issues and practical problems, teachers attend the different conferences/workshops/seminars/round tables, where they meet with specialists from the private sector of food industry and with teachers from other higher education institutions in the country. Meetings aimed identifying the needs and expectations of employers in the field and to coordinate the curricula with similar programs in other higher education institutions.

**10. Evaluation**

| Type of activity | 10.1. Evaluation criteria | 10.2. Evaluation methods | 10.3. Percent of the final grade |
|---|---|---|---|
| **10.4. Course** | Logic, correct and coherent application of the concept learned | Continuous evaluation | 50% |
| **10.5. Seminary/Laboratory** | Ability to appropriate interpret the result obtained from food safety and control studies/analyses | Continuous assessment / project | 50% |
| **10.6. Minimal standard of performance** | | | |
| Solving a concrete problem / case study regarding the quality and quality control of food products including the argumentation of the applied methods, techniques, procedures and / or instruments.<br>Carrying out an individual project by efficiently using relevant and current documentation sources and resources (including internet, databases, online courses, etc.)<br>Obtaining the pass mark at the knowledge verification at the end of the laboratory works is a condition for obtaining an overall passing grade. | | | |

[1] Level of study- to be chosen one of the following - Bachelor/Post graduate/Doctoral

[2] Course regime (content) – for bachelor level it will be chosen one of the following - **DF** (fundamental subject), **DD** (subject in the domain), **DS** (specific subject), **DC** (complementary subject).

[3] Course regime (compulsory level) - to be chosen one of the following - **DI** (compulsory subject), **DO** (optional subject), **DFac** (facultative subject)
[4] One ECTS is equivalent with 25-30 de hours of study (didactical and individual study).

Filled in on
08.09.2021

Course coordinator
**Prof. dr. Sonia Socaci**
Socaci Sonia
**Lecturer Anca Fărcaş**

Laboratory work/seminar coordinator
**Lecturer Anca Fărcaş**

Subject coordinator
**Prof. dr. Sonia Socaci**
Socaci Sonia

Approved by the
Department on
22.09.2021

Head of the Department
**Prof. dr. Ramona Suharoschi**

Approved by the Faculty
Council on
28.09.2021

Dean
**Prof. dr. Elena Mudura**