

Annex 6

DISCIPLINE DESCRIPTION

1. Information on the study programme

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| 1.1 Academic institution | UNIVERSITY OF ORADEA |
| 1.2 Faculty | FACULTY OF ENVIRONMENTAL PROTECTION |
| 1.3 Department | ENGINEERING OF FOOD PRODUCTS |
| 1.4 Field of study | CONTROL AND EXPERTISE OF FOOD PRODUCTS |
| 1.5 Cycle of study | BACHELOR |
| 1.6 Study programme/Qualification | CONTROL AND EXPERTISE OF FOOD PRODUCTS/ ENGINEER |

2. Information on the discipline

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|---------------------------------------|--|--------------|----|------------------------|-----|--------------------------|---|
| 2.1 Name of discipline | FOOD ADDITIVES AND INGREDIENTS IN THE FOOD INDUSTRY | | | | | | |
| 2.2 Course holder | Simona Ioana VICAS | | | | | | |
| 2.3 Seminar/Laboratory/Project holder | Simona Ioana VICAS | | | | | | |
| 2.4 Year of study | II | 2.5 Semester | IV | 2.6 Type of evaluation | EX. | 2.7 Regime of discipline | C |

(C) Compulsory; (O) Optional; (E) Elective

3. Total estimate time (hours per semester of didactic activities)

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|---|-----|-----------------------------|----|--|-------|
| 3.1 Number of hours per week | 4 | out of which: 3.2 course | 2 | out of which 3.3 seminar/laboratory/project | 1 |
| 3.4 Total hours in the curriculum | 42 | out of which: 3.5 course | 28 | out of which 3.6 seminar/laboratory/project | 14 |
| Time allotment | | | | | hours |
| Study assisted by manual, course support, bibliography and notes | | | | | 25 |
| Additional documentation in the library/ on specialised electronic platforms and in the field | | | | | 23 |
| Preparation of seminars/laboratories/ topics/reports, portfolios and essays | | | | | 10 |
| Tutorship | | | | | |
| Examinations | | | | | |
| Other activities..... | | | | | 14 |
| 3.7 Total hours of individual study | 58 | | | | |
| 3.9 Total hours per semester | 100 | | | | |
| 3.10 Number of credits | 4 | | | | |

4. Prerequisites (where appropriate)

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| 4.1 curriculum | Knowledge of organic chemistry, biochemistry, analytical chemistry |
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| 4.2 competences | The ability to work after a protocol laboratory, to make assumptions and observations, to make charts and tables based on the results obtained in the laboratory |
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5. Conditions (where appropriate)

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| 5.1. related to course | Classroom, equipped with laptop, projector and adequate software |
| 5.2. related to seminar/laboratory/ project | Laboratory equipped with laboratory instruments, spectrophotometer, reagents, solutions, glass, materials, projector |

| 6. Specific competences acquired | |
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| Professional competences | <p>Description and use of basic concepts, theories and methods used in food expertise related to chemical compounds that determine the quality and traceability of food products, the transformations that they undergo during processing, transport and storage, the apparatus and methods for determining and analysis of these compounds and the relevant legislation (knowledge provided by the disciplines of general, inorganic, organic chemistry, food chemistry, biochemistry, analytical chemistry, instrumental analysis, microbiology, hygiene, food additives, food quality control)</p> <p>Explanation and interpretation of concepts, methods and models used in food expertise, using basic knowledge on chemical compounds that determine the quality and traceability of food products, the transformations that they undergo during their processing, transport and storage, the methods for the determination and analysis of these compounds and relevant legislation</p> <p>Assessment of the characteristics, performance and limitations of some methods and equipment used in food expertise</p> <p>Description and use of basic concepts, theories and methods of management and marketing in the food industry, methods of food quality management and methods to design and launch a new product on the market (information provided by the disciplines of management, marketing, commodities, accounting, food quality control).</p> <p>Application of basic principles and methods for solving the problems related to the management and marketing in the food industry and the implementation of quality management systems of food products</p> |
| Transversal competences | |

7. Objectives of discipline (coming from the specific competences acquired)

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| 7.1 General objective | Familiarize students with the theory and practice on the use of food additives, synergistic effect of using additives and toxicological aspects related to each additive. The course content and practical activities are so organized as to be specific to the field of control engineering and processing agricultural products. |
| 7.2 Specific objectives | Familiarize students with the theoretical notions about the main food additives (preservatives, antioxidants, colorants, |

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| | <p>acidifiers etc.).</p> <p>Familiarize students with the mechanisms of action of food additives.</p> <p>The ability of students to apply certain laboratory methods for identifying food additives.</p> <p>Knowledge of legislation on food additives.</p> |
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8. Content*/

| 8.1 Course | Methods of teaching | No. of hours/Remarks |
|--|--|----------------------|
| The definition of food additive. Classification of food additives. Codification of food additives. Terms of use of food additives. | Exposure, discussion, PowerPoint presentations | 2 |
| Toxicological evaluation of food additives. The legislation on food additives. Codex Alimentarius. | Exposure, discussion, PowerPoint presentations | 2 |
| Food preservatives. Overview. Role. Classification. Organic preservative additives. Food preservatives (E200-E240). | Exposure, discussion, PowerPoint presentations | 2 |
| Food preservatives. Inorganic food preservatives. Food preservatives (E249-E290). | Exposure, discussion, PowerPoint presentations | 2 |
| Oxidation of foodstuffs. | Exposure, discussion, PowerPoint presentations | 2 |
| Factors that affect the oxidation of oils. | Exposure, discussion, PowerPoint presentations | 2 |
| Antioxidants. Definition. Classification. Mechanisms. | Exposure, discussion, PowerPoint presentations | 2 |
| Synthetic antioxidants. Natural antioxidants. | Exposure, discussion, PowerPoint presentations | 2 |
| Natural and synthetic food dyes. | Exposure, discussion, PowerPoint presentations | 2 |
| Enzymatic and non-enzymatic browning food (Maillard reaction). | Exposure, discussion, PowerPoint presentations | 2 |
| Flavors. Flavors and flavor enhancers. Relationships between chemical structure and aromatic qualities. | Exposure, discussion, PowerPoint presentations | 2 |
| Acidifiers. | Exposure, discussion, | 2 |

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| | PowerPoint presentations | |
| Natural sweeteners and sweeteners. | Exposure, discussion, PowerPoint presentations | 2 |
| Enzymes used in food industry | Exposure, discussion, PowerPoint presentations | 2 |
| Bibliography Branen Larry, P. Davidson Michael, Seppo Salminen, John H. Thorngate III, Food Additives, Second Edition Revised and Expanded, 2001, Marcel Dekker, New York • Basel Socaciu C., Curs de chimie alimentara si aditivi alimentari, Cluj-Napoca, 1997 Tofana M., Aditivi alimentari Interactiunea cu alimentul, Ed. AcademicPres, Cluj Napoca, 2006 Banu C., -coordonator, Manualul inginerului de industrie alimentara. Vol. I si II, Ed Tehnica, Bucuresti, 1998 Banu C., -coordonator, Aditivi si ingrediente pentru industria alimentara, Editura Tehnica, 2000. Vicas S.I. - Aditivi alimentari –curs, Ed. Univ. Oradea, 2015, ISBNe 978-606-10-1663-1 The courses are uploaded to the e-learning platform of the University of Oradea, which can be accessed at https://e.uoradea.ro | | |
| 8.2 Seminar | Methods of teaching | No. of hours/ Remarks |
| | | 2 |
| 8.3 Laboratory | | |
| General rules on work protection in laboratory. | Exposure, discussion | 1 |
| Preparation the food samples in order to make physico-chemical analysis. | Explanations, exemplification, dialogue, case study, videos | 1 |
| Method for the solutions preparation in the laboratory. Elements of calculation. | Explanations, exemplification, dialogue, case study | 1 |
| General remarks on food additives. | Explanations, exemplification, dialogue, case study | 1 |
| Ingredients. Determination of sodium chloride. Mohr method. | Students performing the experimental section with the professor's assistance. | 1 |
| Qualitative and quantitative determination of preservatives. Identification of SO ₂ and its derivatives (E220-228). | Students performing the experimental section with the professor's assistance. | 1 |
| Preservatives. Determination of salicylic acid. | Students performing the experimental section with the professor's assistance. | 1 |
| Preservatives. Determination of sodium nitrite in different food products | Students performing the experimental section with the professor's assistance. | 1 |
| Antioxidants. Determination of ascorbic acid by titrimetric method. | Students performing the experimental section with | 1 |

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| | the professor's assistance. | |
| Antioxidants. Determination of antioxidant activity by DPPH method (spectrophotometric method) of foodstuff. | Students performing the experimental section with the professor's assistance. | 2 |
| Antioxidants. Determination of antioxidant capacity of different food by DPPH method. | Students performing the experimental section with the professor's assistance. | 1 |
| Food colorants. The separation of food dye by thin layer chromatography (TLC) . | Students performing the experimental section with the professor's assistance. | 1 |
| Acidulants. Determination of acetic acid by the titrimetric method. Processing of experimental results. | Students performing the experimental section with the professor's assistance. | 1 |
| Enzymes. Determination of enzymatic activity of polyphenol oxidase. The implication of the enzyme in the browning process of foods. | Students performing the experimental section with the professor's assistance. | 1 |
| Laboratory test. The presentation of report regarding to certain food additive. | Testing the theoretical and practical knowledge acquired by the student in the field of food additives | 1 |
| Bibliography Vicas S.I., Morna A. –Aditivi alimentari –caiet de lucrări practice, Ed. Univ. Oradea, 2015, ISBNe 978-606-10-1664-8. Tofana M., Socaci S., Aditivi alimentari, Indrumator de laborator, Editura Mega, 2011. Oranescu E., Aditivi alimentari, necesitate si risc, Editura Agir, Bucuresti, 2008. The laboratories are uploaded to the e-learning platform of the University of Oradea, which can be accessed at https://e.uoradea.ro | | |

* The content, respectively the number of hours allocated to each course / seminar / laboratory / project will be detailed during the 14 weeks of each semester of the academic year.

9. Corroboration of discipline content with the expectations of the epistemic community, professional associations and representative employers from the field corresponding to the study programme

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| <ul style="list-style-type: none"> ▪ The content of the course "Food additives" is consistent with what is done in other Universities in the country at Food Engineering profiles ▪ By acquiring theoretical concepts and practical aspects included in discipline, students acquire substantial knowledge according to the skills required for possible occupations provided in the Grila – RNCIS ▪ In order to improve and upgate the content of the courses, the professors participate in various online refresher courses. |
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10. Evaluation

| Type of activity | 10.1 Evaluation criteria | 10.2 Evaluation methods | 10.3 Share in the final grade |
|------------------|---|-------------------------|-------------------------------|
| 10.4 Course | The exam is oral. Verification tests are given at the end of each course, and the results of them count toward 20% of | Oral exam | 70% |

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| | the total grade. The logical, accurate, and cohesive application of the learned concepts will be evaluated during assessment of students. | | |
| 10.5 Seminar | | | |
| 10.6 Laboratory | The efforts brought by each student to the practical laboratory activity during the semester will be recorded during all scheduled laboratory sessions, and the results are supplemented by the oral report that is presented during the laboratory colloquium by the student (word document + Power Point) and whose topic will be determined at the beginning of the semester. | | 30% |
| 10.7 Project | | | |
| 10.8 Minimum standard of performance | | | |
| Acquisition of acceptable-level scientific knowledge given in classes in addition to practical work. | | | |

Date of completion

Signature of course holder**

Signature of seminar
laboratory/project holder **

Prof. dr. Simona Ioana Vicas,
(svicas@uoradea.ro)

Prof. dr. Simona Ioana Vicas,
(svicas@uoradea.ro)

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Date of approval in the department

Signature of the Head of Department

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Lecturer eng. Adrian Timar, PhD

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Dean signature

Assoc. Prof. dr. Cristina Maerescu,