**SUBJECT DESCRIPTION**

**1. Information on the study programme**

| | |
|---|---|
| 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 | **TECHNOLOGY OF AGRICULTURAL PRODUCTS PROCESSING/ENGINEER** |

**2. Information on the discipline**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 2.1 Name of discipline | | | **COLLOIDAL CHEMISTRY** | | | | |
| 2.2 Course holder | | | Associate prof. dr.Purcărea Cornelia | | | | |
| 2.3 Seminar/Laboratory/Project holder | | | Lecturer dr.Anamaria Morna | | | | |
| 2.4 Year of study | II | 2.5 Semester | 4 | 2.6 Type of evaluation | E | 2.7 Regime of discipline | C |

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

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

| | | | | | |
|---|---|---|---|---|---|
| 3.1 Number of hours per week | 4 | out of which: 3.2 course | 2 | out of which 3.3 seminar/laboratory/project | 2 |
| 3.4 Total hours in the curriculum | 56 | out of which: 3.5 course | 28 | out of which 3.6 seminar/laboratory/project | 28 |
| Time allotment | | | | | hours |
| Study assisted by manual, course support, bibliography and notes | | | | | 20 |
| Additional documentation in the library/ on specialised electronic platforms and in the field | | | | | 20 |
| Preparation of seminars/laboratories/ topics/reports, portfolios and essays | | | | | 10 |
| Tutorship | | | | | 10 |
| Examinations | | | | | 4 |
| Other activities..... | | | | | |
| **3.7 Total hours of individual study** | **74** | | | | |
| **3.9 Total hours per semester** | **130** | | | | |
| **3.10 Number of credits** | **5** | | | | |

**4. Prerequisites** (where appropriate)

| | |
|---|---|
| 4.1 curriculum | Organic chemistry, Agrifood biochemistry, Additives of food |
| 4.2 competences | Computer skills |

**5. Conditions** (where appropriate)

| | |
|---|---|
| 5.1. related to course | Projector |
| 5.2. related to seminar/laboratory/ project | Laboratory equipment and reagents mandatory for laboratory protocol |

| 6.Specific competences acquired | |
|---|---|
| Professional competences | **C1. Operation of equipment in food production units.**<br>C1.1. Description and use of basic concepts, theories and methods for food engineering on the structure and properties of food components and contaminants, the transformations that they undergo during processing, the devices, equipment and technologies in food industry (knowledge provided by disciplines such as: general, inorganic, organic chemistry, food chemistry, biophysics, biochemistry, physical and colloidal chemistry, devices, equipment and technologies in the food industry)<br>C1.3. Application of basic principles and methods in food engineering to solve technological problems related to the operation of the food industry equipment.<br>**C3.** Operation of monitoring and automation systems for the processes in food industry and for the food quality control and expertise laboratories<br>▪ C3.2. Explanation and interpretation of basic concepts, methods and models based on monitoring and automation systems addressed to the processes in the food industry and to the food quality control and expertise laboratories.<br>**C4. Quality control of food, raw and auxiliary materials.**<br>C4.1. Description and use of basic concepts, theories and methods used in quality control of food products, on the chemistry of compounds that determine food quality, the transformations that they undergo during processing, transport and storage, the apparatus and methods for determining and analyzing of these compounds (knowledge provided by the disciplines of general, inorganic, organic chemistry, food chemistry, biochemistry, analytical chemistry, instrumental analysis, microbiology, hygiene, food additives, food quality control)<br>**C5. Expertise of food, raw and auxiliary materials.**<br>C5.1. 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) |

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

| | |
|---|---|
| 7.1 General objectives | • Familiarize students with the main colloids and emulsifiers used in the food industry, issues of their chemical structure, physicochemical properties, mechanisms of action and information on toxicological conditions and their utilisation |
| 7.2 Specific objectives | • Exemplify the use of colloids in food |

**8. Contents***

| 8.1 Curs | Metode de predare | Nr. Ore / Observaţii |
|---|---|---|
| 1.Introduction in colloidal chemistry. What are the colloids. Clasification and properties | ppt presentation | 2 |
| 2.Hydrocolloids. Lyophilic colloidal system. Clasification of hydrocolloids | ppt presentation | 2 |
| 3. Olysaccharides as hydrocolloids. Starch and modified starch | ppt presentation | 2 |
| 4.Celulose. Dextran | ppt presentation | 2 |
| 5. Mano-galactans Guar gum, Carruba. | ppt presentation | 2 |
| 6. Sulfated galactan. Agar, Carageenan | ppt presentation | 2 |
| 7. Polyuronides - Pectin. Arabic gum. Tragacantha gum. Alginate, Xhantan gum | ppt presentation | 2 |
| 8.Proteins as hydrocolloids. Characteristic | ppt presentation | 2 |
| 9. Vegetal protein as hydrocolloids | ppt presentation | 2 |
| 10.Animal protein as hydrocolloids. | ppt presentation | 2 |
| 11. Emulsification. Emulsions. Classification. Property. | ppt presentation | 2 |
| 12.Emulsifiers. The role of emulsifiers in the food industry. Classification. Mechanism of action. | ppt presentation | 2 |
| 13.Main agrifood emulsifiers | ppt presentation | 2 |
| 14.Efficience The role of emulsifiers in the food industry. | ppt presentation | 2 |
| Bibliografie | | |

1. .Banu C- *Aditivi şi ingrediente pentru industria alimentară*, Ed. Tehnică Bucureşti 2000;
2. .Banu C., - *Manualul inginerului de industrie alimentară*, Editura Tehnică Bucureşti, p.345-368, 2002
3. .Banu C., coordonator – *Tratat de industrie alimentară, probleme generale, vol. I.* Editua ASAB, 2008.
4. .Jianu I, Delia Dumbravă - *Extracte şi aditivi agroalimentari*. Timisoara, 1997
5. .Pârvu D., - Hidrocoloizi şi emulgatori în industria agroalimentară.Ed Eurostampa Timişoara, 1999.
6. Purcărea C. Chiș A – Coloizi în industria alimentară, 2012, Editura Universității din Oradea

| | Metode de predare | Nr. Ore / Observaţii |
|---|---|---|
| 8.3 Laborator | | |
| 1 General laboratory safety rules and regulations for biochemistry laboratories | Signed the tabel for labor protection; aplication | 2 |
| 2.Colloidal system; Colloidal solution obtaining; Colloids viscosity; | Aplication, experiments | 2 |
| 3. Viscosity determination in some gums in different condition | Aplication, experiments | 2 |
| 4. Glucosan – Strach identification and quantitative determination | Aplication, experiments | 2 |
| 5.Dextrins – Obtaining dextrins with starch hydrolysis | Aplication, experiments | 2 |
| 6. Agar – Solidification depending on the pH **a**nd Temperaturr<br>Presentation of the methodology of choice of topics for essay writing | Aplication, experiments | 2 |
| 7. Poliuronides. Pectines | Aplication, experiments | 2 |
| 8. Determination of esterification degree in pectines | Aplication, experiments | 2 |
| 9. Milk protein – Milk coagulation - izoelectric point | Aplication, experiments | 2 |
| 10. Test -hydrocolloids<br>Emulsions - methods of making emulsions; Getting mayonnaise | Aplication, experiments | 2 |
| 11.Emulsions – Highlighting emulsifiers action | Aplication, experiments | 2 |
| 12.Emulsions- Extraction and identification of yolk lecithin | Aplication, experiments | 2 |
| 13. Test - emulsions | Aplication, experiments | 2 |
| 14. Essay presentation | Videoproiector, laptop, ppt | 2 |

References

1. .Purcarea C.Vicaş S. - Coloizi in industria alimentara , Lucrari practice. Uz intern. 2009
2. Chis A., Morna A., Indrumător laborator coloizi. 2013.
3. ***Colecţia de standarde - industria alimentară şi calitatea apei
4. *** LEGIS – program informatic referitor la legislatia din Romania
5. *** www.codexalimentarius.net

* 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**

Students will gain the necessary knowledge about the role and use of colloids as a food additive, for different food groups

**10. Evaluation**

| Type of activity | 10.1 Evaluation criteria | 10.2 Evaluation methods | 10.3 Share in the final grade |
|---|---|---|---|
| 10.4 Cours | The way in wich responded to the test | Written examination- Test with 9 questions | 60% |
| 10.6 Laboratory | • Mode of execution / computing practical | • Summative Evaluation based on continuous assessment ofon practical | 20% |

| | | | |
|---|---|---|---|
| | examples<br>• presentation | operational activity în laboratory and additional themes.<br>• Report presentation of a food, nomination colloids contained and their role (ppt presentation)<br>Note:<br>1. The topics of essays are selected based on the concepts taught in the course, laboratory methodology and references; will refer to a specific food product to be analyzed and presented as photographic image and communicates în weeks 7 and 8, to avoid overlap;<br>2. Essay must be send by e-mail in the 13 week in ppt and will be prezented in week 14 | 20% |
| 10.8 Standard minim de performante:<br>at least 5 answers to the written exam test ; at least 5 grad at laboratory activity and essay | | | |

Date of completion

01.02.2019 .

Signature of the course holder

Associate professor
Dr Purcărea Cornelia
cpurcarea@uoradea.ro

Signature of laboratory holder

Lecturer
Dr Anamaria Morna
anamaria_simut@yahoo.co.uk

Date of approval in the department
.....

Signature of the Head of Department

Lecturer Dr ing.
Adrian Timar
atimar@uoradea.ro

Dean Signature
Prof univ dr. Chereji Ioan
ichereji@uoradea.ro