

DISCIPLINE 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	MASTER
1.6 Study programme/Qualification	FOOD SAFETY AND SECURITY / ENGINEER

2. Information on the discipline

2.1 Name of discipline	OPTIC AND CHROMATOGRAPHIC METHODS IN FOOD INDUSTRY					
2.2 Course holder	Senior Lecturer Eng. Adriana Chiş, PhD					
2.3 Seminar/Laboratory/Project holder	Senior Lecturer Eng. Adriana Chiş, PhD					
2.4 Year of study		2.5 Semester		2.6 Type of evaluation		2.7 Regime of discipline
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(C) Compulsory; (O) Optional; (E) Elective

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

3.1 Number of hours per week	3	out of which: 3.2 course	1	out of which 3.3 seminar/laboratory/project	2
3.4 Total hours in the curriculum	42	out of which: 3.5 course	14	out of which 3.6 seminar/laboratory/project	28
Time allotment					hours
Study assisted by manual, course support, bibliography and notes					30
Additional documentation in the library/ on specialised electronic platforms and in the field					30
Preparation of seminars/laboratories/ topics/reports, portfolios and essays					25
Tutorship					10
Examinations					4
Other activities: documentation on laboratory optical and chromatographically techniques in food laboratory in Bihor County					30
3.7 Total hours of individual study	112				
3.9 Total hours per semester	154				
3.10 Number of credits	6				

4. Prerequisites (where appropriate)

4.1 curriculum	BA graduated whit Analytical Chemistry, Organic Chemistry and Biochemistry disciplines in curriculum
4.2 competences	Intimate knowledge of Analytical Chemistry, Organic and Inorganic Chemistry , food composition, Word, Excel, PowerPoint utilisation

5. Conditions (where appropriate)

5.1. related to course	Projector, screen, internet connection
5.2. related to laboratory	Laboratory devices and chemical reagents used for experiments in accord with discipline curriculum

6. Specific competences acquired	
Professional competence	- The exposure of concepts of high theoretical and practical level and in the field of foods through optical and chromatographic methods - The proper use of optical and chromatographic type in the food field - Identification of optimal customized methods in relation with the type of food analysed through optical and chromatographically methods - Correct interpretation and explanation with scientifically arguments of the analytic results obtained through the application of the optical and chromatographic methods - Assessment of specific methods presented in the specialized scientific literature in relation with the determination of the features of foods through optical and chromatographic methods - Obtaining the ability to elaborate a plan of optical and chromatographic determinations for the research of a target food group
Transversal competences	- The elaboration a specialized words in English regarding the results obtained through the application of optical and chromatographic analytical methods - Use of efficient methods and techniques of study along the entire life, for the continuous personal and professional training and development

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

7.1 General objective	- Assimilation by the master students of latest optical and chromatographically methods used in food industry control - Assimilation by the master students of checking on-line scientific information in this field of research
7.2 Specific objectives	Examples of appliance of named methods in food control

8. Content*/

8.1 Course	Methods of teaching	No. of hours/Remarks
1- Fundamental principles of optical methods	Interactive lecture and PowerPoint presentation	2
2 - Optical methods in food control 2.1 - UV-Vis and NIR spectroscopy 2.2 – Atomic absorption and emission spectroscopy; Inductive Coupled Plasma spectroscopy v		8
3- Fundamental principles of chromatography methods 3.1 – Samples preparation – Separation in liquid and solid phase; Micro extraction		2
4 – Chromatography methods in food control 4.1 – Thin Layer Chromatography 4.2 – Gas Chromatography 4.3 – Liquid Chromatography 4.4 – Ion Chromatography; Gel Chromatography 4.5 – Mass spectroscopy as detection in Chromatography		15
5 – Instrumental analysis of smell and colour in food		1
Bibliography 1. Cordoș E., Frențiu T., Rusu Ana-Maria, Ponta Michaela, Fodor A., 1998, Analiza prin spectrometrie atomică, Institutul Național de Optoelectronică București 2. Gocan S, 1998, Cromatografia de înaltă performanță, Partea I. Cromatografia de gaze, Editura Dacia, Cluj-		

Napoca - Gocan S, 2002, Cromatografia de înaltă performanță, Partea II. Cromatografia de lichide pe coloană, Editura Risoprint, Cluj-Napoca - Gocan S.și Simona Cobzac, 2006, Metode moderne de prelucrare a probelor organice, Editura Risoprint, Cluj-Napoca - Jercan Elena, 1982, Analiza cromatografică, Editura Academiei RSR, București - Multon, J. L., 1997, Analysis and Control Methods for Food and Agricultural Products, Analysis of Food Constituents (Analysis and Control Methods for Foods and Agricultural Products - Neacșu H. I. și Janstsch L., Chimie analitică și instrumentală, 2006, Editura Academic pres & AcademicDirect Cluj-Napoca - Nielssen Suzanne (ed.), 2003, Food Analysis Third Edition, Springer Science. USA, <i>Kluwer Academic, New York</i> - Otles S (Ed), 2008, Handbook of Food Analysis instruments, CRC Press, Taylor & Frances Group - Pietrzyk D. și C. Frank, 1989, Chimie analitică, Editura Tehnică, București - Tadeo, J. L., (ed.), 2008, Analysis of Pesticides in Food and Environmental Samples, <i>CRC Press, Taylor & Frances Group Boca Raton , London, New York</i> *** LEGIS – program informatic referitor la legislatia din Romania *** www.codexalimentarius.net		
	Methods of teaching	No. of hours/ Remarks
8.3 Laboratory	Interactive lecture and practical applications	
Work protection in optic and chromatograph laboratory		2
Devices in optic spectroscopy and chromatograph methods		2
Calibration curves is spectroscopy		2
Anions determination from food and water by spectroscopic methods		4
Antioxidant components from food determination by spectroscopic methods		4
Enzymatic activity determination by spectroscopic methods (catalase, diastase)		2
Freshness parameter of honey – HMF- determination by UV by spectroscopic methods		2
Food samples mineralisation for metals determination		2
Food samples prepatation for chromatography: liquid extraction for pesticides		2
Qualitative and cantitative interpretation of gas chromatograms		2
Food component determination by HPLC		2
Paper presentation	Projector, laptop, ppt presentation	2
Bibliography		
- Alexa, Ersilia, 2003, Contaminanți în produse vegetale, Ed. Eurobit, Timișoara - Ana, Alex. C. 2002, Manual de lucrari practice in oenologie, Galati: Editura Fundatiei Universitare "Dunarea de Jos" Galati - Chircan, I., Toporan, Daniela, 2005, Indrumator pentru lucrari practice în industria cărnii și a peștelui, Ed. Sitech, Craiova - Hura, Carmen, 2006, Ghid de laborator – Metode de analiză pentru produse alimentare, <i>Ed. Cermi, Iași</i> - Jianu I., Alexa Ersilia, 1998, Cromatografia în strat subțire în analiza și controlul produselor agroalimentare, Editura Eurobit, Timișoara - Nour, Violeta, 2008, Metode de analiză și control în industria cărnii și a produselor din carne, Ed.Sitech, Craiova - Rotaru, O. și M. Mihaiu, 2002, Igiena veterinară a produselor alimentare – Patologie prin alimente, Editura Todesco, Cluj-Napoca *** colecția de standarde pentru produse alimentare prin www.asro.ro *** norme comunitare pentru siguranța alimentară prin www.efsa.com *** www.elsevier.com *** www.springer.com *** www.amazon.com *** LEGIS – program informatic referitor la legislatia din Romania *** www.codexalimentarius.net		

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

Master students will acquire knowledge and practical abilities for quality control activities of foods by optic and chromatograph methods

* 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.

10. Evaluation

Type of activity	10.1 Evaluation criteria	10.2 Evaluation methods	10.3 Share in the final grade
10.4 Course	Test answer and problem solving	Write test – 8 questions and a problem	60%
10.6 Laboratory	• Execution and calculation of practical determinations • Elaboration and sustain of the paper	Global evaluation • - Continuous evaluation based on laboratory practical activities • - Presentation of a paper referring to an optic or chromatograph deetermination in food including drinkable water or waste water from food industry Note: - the paper subject will be choose by the student based on the preposed bibliography or any other available sources and are to be communicated during 9 and 10th week in order to avoid similar subject - The paper is submitted by e-mail in doc (printed) and ppt form during the 13th week and will be presented in the 14th week during the laboratory classes	20% 40%
10.8 Minimum standard of performance: minimum 5 questions of the test and minimum 5 grade in laboratory activities			

Date of completion

Signature of course holder**

Signature of seminar/ laboratory **

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Date of approval in the department

Signature of the Head of Department

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** - Name, first name, academic degree and contact details (e-mail, web page, etc) will be specified