



UNIVERSITY OF WEST ATTICA

SCHOOL OF FOOD SCIENCES

DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY

**LIST OF UNDERGRADUATE COURSES FOR THE
ACQUISITION OF DIGITAL SKILLS**

ACADEMIC YEAR 2023-2024

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Part A: BASIC CYCLE PROGRAM

1. List of Undergraduate Courses for acquisition of digital skills

Based on Topic 5 of the Assembly 18/18-10-2023 of the Department of Food Science and Technology entitled "Definition of courses of the undergraduate study programs of the Department, which fall into the area of IT and computer operation" taking into account:

1. The provisions of Law 4521/2018 (F.E.K. 38/A'/02.03.2018) "Establishment of the University of Western Attica and other provisions", as applicable
2. The provisions of Law 4009/2011 (F.E.K. 195/A'/6.9.2011) "Structure, Operation, Ensuring the Quality of Studies and Internationalization of Higher Education Institutions", as applicable
3. The provisions of Law 4485/2017 (F.E.K. 114/A'/04.08.2017) "Organization and operation of higher education, regulations for research and other provisions", as applicable

the five (5) compulsory and three (3) elective courses of the Undergraduate Study Program of the Department of Food Science and Technology that fall within the area of informatics and computer management were defined:

S/N	Course title	ECTS	Semester	Παρατηρήσεις
1	Information Technology Applications	4	1	Compulsory
2	Marketing Food Products	4	3	Compulsory
3	Food Engineering II	7	4	Compulsory
4	Food Processing II	7	5	Compulsory
5	Instrumental Food Analysis	8	6	Compulsory
6	New Food Product Development	3	7	Elective
7	Precision Nutrition	3	7	Elective
8	Computational Chemistry and Cheminformatics in Food Science	3	7	Elective

2. Detailed Undergraduate Course Description for the acquisition of digital skills

The detailed description of the courses follows, being an extract from the appendix of the Study Guide of the Department of Food Science and Technology:

COURSE OUTLINE

(1) GENERAL

SCHOOL	SCHOOL OF FOOD SCIENCES		
ACADEMIC UNIT	DEPARTMENT OF FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	1061-1062	SEMESTER	1
COURSE TITLE	INFORMATION TECHNOLOGY APPLICATIONS		
INDEPENDENT TEACHING ACTIVITIES <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>	WEEKLY TEACHING HOURS	CREDITS	
LECTURES	2		
LABORATORY EXERCISES	1		
TOTAL	3	4	
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Background/General Knowledge/Skills Development		
PREREQUISITE COURSES:	..		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)			

(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, students will be able to:

- To use the Excel program and more specifically to be familiar with:
 - - cell management
 - - management of functions (logical, statistical, economic, etc.)
 - -creation of graphical expressions
 - - use of macros
 - -creation of statistics
 - - creation of tables
- To use the Powerpoint program and more specifically to be familiar with:
 - -creation and management of presentation
 - -insert graphical representations of tables and graphics
- -use of multimedia (video and audio)
- To use the Word program and more specifically to be familiar with:
 - - text formatting
 - -inserting image tables and graphs
 - -introduction of mathematical equations
 - -insert reference (captions, footnotes contents, etc.)
 - -bibliography introduction

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?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking

Others...

Adaptation to new situations.
 Autonomous work.
 Working in an international environment.
 Teamwork
 Working in an international environment
 Project planning and management

(3) SYLLABUS

COURSE CONTENT

Description: Learning Excel , Word, Powerpoint programs

More specifically, the course content includes:

1.Excel

Cell management, Formatting, Protect cells, Functions Statistical, reasonable, informative, economic, date-time, Graphs, Column/row chart, Scatter chart, Pie chart , Conditional configuration and data validation , formatting, Filters, Macros, Statistics

2.Powerpoint

Create a presentation, Insert slides, Slide drawings, Ordinance, Presentation Management, Insert effects, Insert graphs, tables, and graphics, Enter data into tables, Tables interconnected (with Excel), Insert/change graph title, Manage graph caption, Insert a picture, Image editing (crop, rotate), Use media, Insert video, Insert audio

3.Word

Format text, Fonts (bold, italic, color, etc.), Paragraphs (indentation, spacing, etc.), Columns, Page layout, Insert tables, pictures, and graphs, Merge/split table cells, Import images from computer / internet, Graph management (caption, titles, etc.), Introduction of mathematical equations, References, Image/table captions, Footnotes, Table of Contents, Index, Literature, Bibliography, Management (import, edit)

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Educational material is available, information via the Web & communication with students and via e-mail.	
TEACHING METHODS <i>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</i>	Activity	Semester workload
	Lectures 2 hours	78
	Laboratory 1 hour	39
COURSE TOTAL		117
STUDENT PERFORMANCE EVALUATION <i>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.</i>	Written examination on issues of graded difficulty, including <ul style="list-style-type: none">• solving problems & exercises• comprehension questions. Students have access to both the criteria and the results of the examinations through the department's website and/or the e-class.	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Greek

- 1.Βιβλίο [94700753]: 7 ΣΕ 1 WINDOWS 10 - OFFICE 2019 / MICROSOFT 365, ΓΚΛΑΒΑ ΜΑΙΡΗ [Λεπτομέρειες](#)
- 2.Βιβλίο[122079399] Μαθαίνετε εύκολα Microsoft Office 2021, Ξαρχάκος Κωνσταντίνος Ι., Καρολίδης Δημήτριος Α. [Λεπτομέρειες](#)
- 3.βιβλίο[**112690771**] Πλήρης Οδηγός Microsoft Office 365 και Office 2019
Beskeen David W., Cram Carol M., Friedrichsen Lisa, Wermers Lynn

English

- 1.Kevin Wilson, *Essential PowerPoint 2016*, Elluminet Press
- 2.Jeff L Hutchinson, *Comprehensive Excel 2016 - A Step-By-Step Training Guide*, Create Space Publishing

3. *Jeff L. Hutchinson, Excel 2016 Advanced Features, Create Space Publishing*

4. *Lisa A. Bucki, Microsoft Word 2013 Bible The Comprehensive Tutorial Resource, Wiley*

COURSE OUTLINE

(1) GENERAL

SCHOOL	FOOD SCIENCES		
ACADEMIC UNIT	FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	3051	SEMESTER	3
COURSE TITLE	MARKETING FOOD PRODUCTS		
INDEPENDENT TEACHING ACTIVITIES <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>		WEEKLY TEACHING HOURS	CREDITS
LECTURES		3	4
TOTAL		3	4
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	SPECIAL BACKGROUND		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES (essays)		
COURSE WEBSITE (URL)			

(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*

The purpose of the course is to understand:

- the basic principles of marketing and how they apply to the food industry.
- the ability to recognize the key concepts of value creation and differentiation
- the limitations of the concept of marketing as a basic business principle
- the key communication methods and ensure value to consumers.
- the marketing research tools as well as the use of primary and secondary data
- the way and mechanisms of decision-making

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?

<p><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></p> <p><i>Adapting to new situations</i></p> <p><i>Decision-making</i></p> <p><i>Working independently</i></p> <p><i>Team work</i></p> <p><i>Working in an international environment</i></p> <p><i>Working in an interdisciplinary environment</i></p> <p><i>Production of new research ideas</i></p>	<p><i>Project planning and management</i></p> <p><i>Respect for difference and multiculturalism</i></p> <p><i>Respect for the natural environment</i></p> <p><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></p> <p><i>Criticism and self-criticism</i></p> <p><i>Production of free, creative and inductive thinking</i></p> <p>.....</p> <p><i>Others...</i></p> <p>.....</p>
<ul style="list-style-type: none"> • Decision-making • Working independently • Teamwork • Criticism and self-criticism • Search for, analysis and synthesis of data and information, with the use of the necessary technology • Project planning and management • Respect for the natural environment • Production of free, creative and inductive thinking • Showing social, professional and ethical responsibility and sensitivity to gender issues • Production of new research ideas • Empower presentation skills 	

(3) SYLLABUS

<p>Description:</p> <p>Does the subject of the course focus on 4 main axes?</p> <ol style="list-style-type: none"> 1. Fundamental Principles of Marketing 2. Creating value for Customers - Consumers 3. Communication - Content creation 4. Planning and Marketing Strategy <p>Through case studies, emphasis is placed on Marketing in the food sector. In more detail, the content of the course includes:</p> <ul style="list-style-type: none"> • Introduction to Marketing & its Fundamentals <p>Marketing and operations The marketing environment Consumer's behavior B2B level marketing Marketing, Ethics and Society Marketing Research (Primary, Secondary data, Process stages, use of research tools) Market segmentation, targeting and product placement. Creating value for Customers/Consumers.</p> <ul style="list-style-type: none"> • Products and value. <p>Value through brand, through service, through relationships, through innovation, through price. Marketing communication Types of marketing communication Digital marketing Content creation</p>
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- **Planning and Marketing Strategy**

Marketing Planning
 Competition analysis
 Product life cycle, development

- *Presentation skills in a business environment*

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face to face, distance -synchronous e-learning when necessary.	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of IT technologies in the collection of secondary data - information from relevant electronic bases - repositories. Presentation of semester work using a presentation application (eg Microsoft Powerpoint). Communication with students via e-class, teams, e-mail.	
TEACHING METHODS <i>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</i>	Activity	Semester workload
	Lectures	54
	Study & Analysis of literature	10
	Study and discuss cases in class	15
	Writing and Presentation of Papers	38
	Course total	117
STUDENT PERFORMANCE EVALUATION <i>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.</i>	<ul style="list-style-type: none"> • Language evaluation: Greek • Method of evaluation: Participation in study groups Written essay Presentation & oral examination 	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Principles and practice of marketing. David Jobber & Fiona Ellis-Chadwick, Ninth edition. McGraw-Hill Education.

COURSE OUTLINE

(1) GENERAL

SCHOOL	FOOD SCIENCES		
ACADEMIC UNIT	FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	4011-4012	SEMESTER	4
COURSE TITLE	FOOD ENGINEERING II		
INDEPENDENT TEACHING ACTIVITIES <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>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Laboratory Exercises		3	
Total		6	7
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	<i>special background, Specialized</i>		
PREREQUISITE COURSES:	3011 Food Engineering I		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(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*

After successful completion of the course students will:

- Be able to apply the basic principles and the laws of heat and mass transfer to the food engineering operations.
- Be able to set up and solve the appropriate heat and mass balances for the above operations.
- Understand the mechanical separation processes and to specify the parameters that influence the operation of the equipment used.
- Be able to experimentally determine the basic characteristic factors that are involved in the above processes.

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?

<p><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></p> <p><i>Adapting to new situations</i></p> <p><i>Decision-making</i></p> <p><i>Working independently</i></p> <p><i>Team work</i></p> <p><i>Working in an international environment</i></p> <p><i>Working in an interdisciplinary environment</i></p> <p><i>Production of new research ideas</i></p>	<p><i>Project planning and management</i></p> <p><i>Respect for difference and multiculturalism</i></p> <p><i>Respect for the natural environment</i></p> <p><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></p> <p><i>Criticism and self-criticism</i></p> <p><i>Production of free, creative and inductive thinking</i></p> <p>.....</p> <p><i>Others...</i></p> <p>.....</p>
<ul style="list-style-type: none"> • Search for, analysis and synthesis of data and information, with the use of the necessary technology • Decision-making • Working independently • Team work • Working in an interdisciplinary environment 	

(3) SYLLABUS

<p>Heat exchangers design and optimization.</p> <p>Mass diffusion and transfer (1st & 2nd Fick's laws), moisture transmission in foods (sorption & desorption curves).</p> <p>Mass and Energy balances, application examples in food engineering operations.</p> <p>Food rheology (Newtonian and non-Newtonian fluids, viscoelastic behavior).</p> <p>Mechanical separations (sedimentation, centrifugation, filtration, membrane separation).</p> <p>Heating, cooling and freezing of foods.</p> <p>Food engineering operations (drying, evaporation, distillation, extraction and crystallization).</p>

(4) TEACHING and LEARNING METHODS - EVALUATION

<p style="text-align: center;">DELIVERY</p> <p style="text-align: center;"><i>Face-to-face, Distance learning, etc.</i></p>	Face-to-face	
<p style="text-align: center;">USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY</p> <p style="text-align: center;"><i>Use of ICT in teaching, laboratory education, communication with students</i></p>	Use of Information Technologies in Teaching, Laboratory Education and Communication. Presentations using powerpoints. Information via web (e-class).	
<p style="text-align: center;">TEACHING METHODS</p> <p><i>The manner and methods of teaching are described in detail.</i></p> <p><i>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.</i></p> <p><i>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</i></p>	<p>Activity</p>	<p>Semester workload</p>
	Lectures	117
	Laboratory Exercises	78
	Course total	195

STUDENT PERFORMANCE EVALUATION

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.

Lab reports,
Problem Solving,
Case Studies,
Final examination.

(5) SUGGESTED LITERATURE

- Suggested bibliography:

Νικόλαος Π. Ζόγκζας, 2017, «Βασικές Αρχές Μηχανικής Τροφίμων», εκδόσεις Τζιόλα.
Mc Cabe, Warren L., Smith, Julian C., Harriot, Peter, 2002, «Βασικές Διεργασίες Χημικής Μηχανικής», εκδόσεις Τζιόλα.
Singh R. P., Heldman R. D., 2016, «Εισαγωγή στη Μηχανική Τροφίμων», Εκδόσεις Παρισιανού.
Σαραβάκος, Γ.Δ., 1979, «Τεχνική Θερμικών Διεργασιών» Β' εκδ., εκδόσεις Ε.Μ.Π., Αθήνα.
Σαραβάκος, Γ.Δ., 1984, «Τεχνική Σωματιδίων - Μηχανικοί Διαχωρισμοί», Β' εκδ., εκδόσεις Ε.Μ.Π., Αθήνα.
Foust, A. S., Wenzel, L. A., Clump, C. W., Maus, L. & Anderson, L.B., 1980, *Principles of Unit Operations*, 2nd ed., John Wiley & Sons.
Fryer P. J., Pyle D. L., Rielly C.D., 1997, «Chemical Engineering for the Food Industry», Blackie A. & P., Chapman & Hall, London.
Harper, C.J., 1976, *Elements of Food Engineering*, AVI Publishing Co., Westport, Connecticut.
Heldman, R.D., and Lund, B.D., 2007, *Handbook of Food Engineering*, CRC Press, Taylor & Francis Group, Boca Raton, London New York.
Singh, R.P. and Heldman, R.D., 2009, *Introduction to Food Engineering*, 4th ed., Academic Press, San Diego.
Toledo, R.T., 2007, *Fundamentals of Food Process Engineering*, 3rd ed., Van Nostrand Reinhold, New York.
Valentas, J.K., Rotstein, E., and Singh R.P., 1997, *Handbook of Food Engineering Practice*, CRC Press, Boca Raton, New York.

COURSE OUTLINE

(1) GENERAL

SCHOOL	FOOD SCIENCES		
ACADEMIC UNIT	FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	5011-5012	SEMESTER	5
COURSE TITLE	FOOD PROCESSING II		
INDEPENDENT TEACHING ACTIVITIES <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>		WEEKLY TEACHING HOURS	CREDITS
Lectures		3	
Laboratory Exercises		3	
Total		6	7
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	<i>special background, Specialized</i>		
PREREQUISITE COURSES:	4031 Food Processing I		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(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*

After successful completion of the course students will:

- Understand the basic principles and applications of the main methods of food processing and preservation.
- Be able to describe the methods of food processing with emphasis to the preservation of foods and to the calculations for design-operation of the food processing installations.
- Be familiar with the methods of food preservation which involve heat and mass transfer, low temperatures and irradiation.
- Understand the basic principles of the design methods for these processing methods.
- Understand the factors which influence the characteristics and the quality of the products.
- Be familiar with the equipment used.

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?

<p><i>Search for, analysis and synthesis of data and information, with the use of the necessary technology</i></p> <p><i>Adapting to new situations</i></p> <p><i>Decision-making</i></p> <p><i>Working independently</i></p> <p><i>Team work</i></p> <p><i>Working in an international environment</i></p> <p><i>Working in an interdisciplinary environment</i></p> <p><i>Production of new research ideas</i></p>	<p><i>Project planning and management</i></p> <p><i>Respect for difference and multiculturalism</i></p> <p><i>Respect for the natural environment</i></p> <p><i>Showing social, professional and ethical responsibility and sensitivity to gender issues</i></p> <p><i>Criticism and self-criticism</i></p> <p><i>Production of free, creative and inductive thinking</i></p> <p>.....</p> <p><i>Others...</i></p> <p>.....</p>
<ul style="list-style-type: none"> • Search for, analysis and synthesis of data and information, with the use of the necessary technology • Decision-making • Working independently • Team work • Working in an interdisciplinary environment 	

(3) SYLLABUS

<p>The theory lectures cover the following subjects:</p> <p>Water activity of foods. Food drying. Concentration of liquid foods. Extrusion. Frying. High pressure processing. Food fermentations. Food preservation through the addition of preservatives. Ohmic heating. Processing with pulsed electric fields, oscillating magnetic fields. Hurdle technology.</p> <p>Laboratory exercises deal with the subjects:</p> <p>Thermal processing of foods. Food refrigeration. Food freezing. Water activity of foods. Food drying. Concentration of liquid foods. Extrusion. Frying. Food fermentations. Food preservation through the addition of preservatives.</p>

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY	Face-to-face	
<i>Face-to-face, Distance learning, etc.</i>		
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY	Use of Information Technologies in Teaching, Laboratory Education and Communication. Presentations using powerpoints. Information via web (e-class).	
<i>Use of ICT in teaching, laboratory education, communication with students</i>		
TEACHING METHODS	<i>Activity</i>	<i>Semester workload</i>
<i>The manner and methods of teaching are described in detail.</i>	Lectures	117
<i>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.</i>	Laboratory Exercises	91
<i>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</i>		
	Course total	208

STUDENT PERFORMANCE EVALUATION

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.

- Lab reports,
- Problem Solving,
- Case Studies,
- Final examination.

(5) SUGGESTED LITERATURE

- Suggested bibliography:

Λάζος Ε., Λάζου Α. (2016). Επεξεργασία τροφίμων: 2, Διεργασίες συντηρήσεως με φυσικοχημικές, βιολογικές, νέες & αναδυόμενες τεχνολογίες. ΕΚΔΟΣΕΙΣ ΠΑΠΑΖΗΣΗ

Rahman MS (2007) Handbook of Food Preservation, Second Edition. Food Science and Technology. CRC Press

Ramaswamy HS, Marcotte M (2006) Food Processing: Principles and Applications. CRC Press

Brennan JG, Grandison AS (2011) Food Processing Handbook. John Wiley & Sons

Fellows PJ (2009) Food Processing Technology - Principles and Practice (3rd Edition). Woodhead Publishing

Karel M, Lund DB (2003) Physical Principles of Food Preservation. Marcel Dekker

Saravacos GD, Maroulis ZB (2010) Food Process Engineering Operations. Taylor and Francis

Barbosa-Cánovas GV, Vega-Mercado H (2010) Dehydration of Foods. Springer

Mujumdar AS (2006) Handbook of Industrial Drying. CRC/Taylor & Francis

- Related academic journals:

Journal of Food Processing and Preservation

Food and Bioproducts Processing

Journal of Food Science

Innovative Food Science and Emerging Technologies

LWT - Food Science and Technology

Trends in Food Science & Technology

European Food Research and Technology

Critical Reviews in Food Science and Nutrition

Comprehensive Reviews in Food Science and Food Safety

COURSE OUTLINE

(1) GENERAL

SCHOOL	FOOD SCIENCE σ		
ACADEMIC UNIT	FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	6011-6012	SEMESTER	6
COURSE TITLE	INSTRUMENTAL FOOD ANALYSIS		
INDEPENDENT TEACHING ACTIVITIES <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>		WEEKLY TEACHING HOURS	CREDITS
<i>lectures</i>		3	
<i>tutorial</i>		1	
<i>laboratory exercises</i>		2	
<i>Total</i>		6	8
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	<i>specialised, skills development</i>		
PREREQUISITE COURSES:	5031-5032 CHEMICAL COMPOSITION AND FOOD QUALITY		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greeks		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	No		
COURSE WEBSITE (URL)			

(2) LEARNING OUTCOMES

<p>Learning outcomes</p> <p><i>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.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i> <p>This course will be concerned with the theory and practice of instrumental methods for the separation, identification and quantitative analysis of chemical substances. Satisfactory completion of this course will afford students a working knowledge of analytical instrumentation typically employed in chemical and food research laboratories. It will also provide the student with an appreciation of the relative strengths and limitations of different instrumental based analysis methods.</p> <p>Specific Course Learning Objectives Include:</p> <p>Learn how to select an appropriate instrumental method.</p> <p>Assess sources of error in chemical and instrumental analysis and account for errors in data analysis.</p> <p>Understand the theory behind chemical instruments</p> <p>Recognize interferences in chemical and instrumental analysis.</p> <p>Comprehend the concept of and perform instrument and method calibration.</p> <p>Integrate a fundamental understanding of the underlining physics principles as they relate to specific instrumentation used for atomic, molecular, and mass spectrometry, spectroscopy and chromatography.</p> <p>Understand and be able to apply the theory and operational principles of analytical instruments.</p> <p>Distinguish between qualitative and quantitative measurements and be able to effectively compare and critically select methods for elemental and molecular analyses.</p>

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?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
.....
Others...
.....

Analysis and synthesis of data and information, using the necessary technologies
Working independently
Team work
Production of new research ideas

(3) SYLLABUS

Course Objectives

Introduction to the analytical process, Basic electronics, Signals and noise, Introduction to Spectroscopic Methods, Components of Optical Systems,

Molecular Spectroscopy – Electronic transitions, Introduction to UV-Vis molecular spectroscopy, Beers Law, absorbance, and transmittance, Applications of UV-Vis spectroscopy, Spectrophotometers: wavelength selectors detectors configurations and sources

Fluorescence, phosphorescence and chemiluminescence

Molecular Spectroscopy – Vibrational excitation, IR absorption spectroscopy, Applications of Infrared Spectrometry, Infrared spectroscopy instrumentation

Atomic Spectroscopy, An Introduction to Optical Atomic Spectroscopy, Atomic absorption spectroscopy, Atomic Emission Spectroscopy

Non-spectrometric techniques. Polarimetry. Identification of optically active compounds.

Separation Science, Introduction to chromatography, Fundamentals of chromatographic separations, Gas chromatography, High performance liquid chromatography

Laboratory Objectives:

Spectrophotometric determination of sorbic acid in wine.

Spectrophotometric determination of total phenolics in infusions. Spectrophotometric determination of wine color.

Structure Determination and Identification of Chemical Compounds by Infrared Spectrophotometry. Measurement and Study of the IR Spectra of Simple Organic Compounds – Bands of Characteristic Groups.

Fluorimetric determination of quinine in tonic waters.

Fluorophotometric determination of sodium in water.

Polarimetric determination of sugars.

Determination of fatty acids by GC-FID.

Determination of lipid classes in food fat by Iatroscan TLC-FID.

Determination of phenolic acids by HPLC-DAD

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face-to-face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of Information Technologies in Teaching, Laboratory Education and Communication. Presentations using powerpoints. Information via web (e-class).	
TEACHING METHODS <i>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</i>	Activity	Semester workload
	Lectures	117
	Tutorial	28
	Laboratory Exercises writing of projects using statistical programs, Writing and presenting a literature review	60
	Course total	205
STUDENT PERFORMANCE EVALUATION <i>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.</i>	Assessment methods they can use: Multiple Choice Test, Short Answer Questions, Development Questions, Problem Solving, Written Assignment, Report, Oral Examination, Public Presentation, Laboratory Thesis	

(5) ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

Principles of Instrumental Analysis (6th Edition) by Skoog, Holler and Crouch

- *Related academic journals:*

Analytica Chimica Acta, Analytical Letters, Analytical and Bioanalytical Chemistry

Journal of Food Composition and Analysis , Food Chemistry, Food Analytical Methods

COURSE OUTLINE

(1) GENERAL

SCHOOL	FOOD SCIENCES		
ACADEMIC UNIT	FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	7051	SEMESTER	7
COURSE TITLE	NEW FOOD PRODUCT DEVELOPMENT		
INDEPENDENT TEACHING ACTIVITIES <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>		WEEKLY TEACHING HOURS	CREDITS
LECTURES		2	2
TOTAL		2	2
<i>Add rows if necessary. The organisation of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	SPECIALISED GENERAL KNOWLEDGE		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK (and ENGLISH)		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	YES		
COURSE WEBSITE (URL)	https://fst.uniwa.gr/announcements/analytiko-programma-proptychiakon-spoydon/		

(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 completion of the course the student will

- Know the current state of art regarding innovative food product on the market
- Know how to evaluate the consumer needs towards nutrition and distinguish trends
- Be able to electronically compose an innovative recipe, based on its ingredients by using valid Food composition tables
- Be able to create food labels by following EU and national regulations

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?

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

(3) SYLLABUS

<p>Introduction to the many aspects of the food product development approach:</p> <ol style="list-style-type: none"> 1. Current and future innovative approaches 2. The consumer need and the market trends 3. Steps of the food product development 4. Super Market Safari 5. Focus Groups – Brainstorming for a new idea 6. Assessing consumer trends with digital questionnaires 7. Food composition tables for the nutrient value calculation 8. Recipes conduction (digital) and available tools on the market 9. EU and national Regulations regarding nutrient and health claims 10. Sensoric analysis 11. Food Science issues of the product development

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face to Face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of ICT in teaching, communication with students via platform (eclass) and emails	
TEACHING METHODS <i>The manner and methods of teaching are described in detail.</i> <i>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.</i>	Activity	Semester workload
<i>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</i>	<i>Lectures</i>	50
	<i>study and analysis of bibliography,</i>	6
	<i>interactive teaching</i>	7
	<i>essay writing,</i>	15

	Course total	78
<p>STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i></p> <p><i>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</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<p>Language of evaluation is Greek (and English in case of Erasmus student participation), methods of evaluation is, written examination comprising multiple choice questionnaires, short-answer questions, open-ended questions. Additionally, assessment of written essay upon public presentation</p>	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography:

Έρευνα και Ανάπτυξη νέων προϊόντων και Επιχειρηματικών Σχεδίων

Κωδικός Βιβλίου στον Εύδοξο: 68403328

Έκδοση: 1/2017

Συγγραφείς: Σφλώμος Κωνσταντίνος, Βαρζάκας Θεόδωρος

ISBN: 978-618-83264-4-6

Τύπος: Σύγγραμμα

- Related academic journals:

- Current Opinion in Food Science <https://www.journalguide.com/journals/current-opinion-in-food-science>
- Food Culture & Society <https://www.journalguide.com/journals/food-culture-and-society>
- Food Quality and Preference <https://www.journalguide.com/journals/food-quality-and-preference>

COURSE OUTLINE

(1) GENERAL

SCHOOL	FOOD SCIENCES		
ACADEMIC UNIT	FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	7054	SEMESTER	7
COURSE TITLE	PRECISION NUTRITION		
INDEPENDENT TEACHING ACTIVITIES <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>	WEEKLY TEACHING HOURS	CREDITS	
Lectures	2	3	
Total	2	3	
COURSE TYPE <i>general background, special background, specialised general knowledge, skills development</i>	Specialized, general knowledge		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	Greek (and ENGLISH)		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes		
COURSE WEBSITE (URL)	https://fst.uniwa.gr/announcements/analytiko-programma-proptychiakon-spoydon/		

(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*

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?

*Search for, analysis and synthesis of data and information,
with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas*

*Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and
sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
.....
Others...
.....*

Search for, analysis and synthesis of data and information,

- with the use of the necessary technology
- Adapting to new situations
- Decision-making
- Working independently
- Production of free, creative and inductive thinking
- know to recognize the evidence-based knowledge to applying precision nutrition

(3) SYLLABUS

1. Introduction to precision nutrition
2. Dietary assessment methods – Nutrition Epidemiology
3. Evaluating eating habits
4. National, European and International dietary guidelines (food and nutrient level)
5. The science of -omics in Nutrition
6. Metabolic markers in nutrition, microbiome
7. Applied nutrigenetics – personalized nutrition
8. Prevention and treatment of nutrition related diseases
9. Weight control and eating habits
10. Apps and tools for nutrition, dieting
11. Nutritional intervention
12. Bioethics and society
13. Case studies – applied nutrigenetics

(4) TEACHING and LEARNING METHODS - EVALUATION

DELIVERY <i>Face-to-face, Distance learning, etc.</i>	Face to face	
USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i>	Use of ICT in teaching, communication with students via platform (eclass) and emails.	
TEACHING METHODS <i>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</i>	Activity	Semester workload
	Lectures	50
	study and analysis of bibliography,	6
	interactive teaching	7
	essay writing	15
	Total	78
STUDENT PERFORMANCE EVALUATION <i>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.</i>	Language of evaluation is Greek (and English in case of Erasmus student participation), methods of evaluation is, written examination comprising multiple choice questionnaires, short-answer questions, open-ended questions. Additionally, assessment of written essay upon public presentation	

(5) ATTACHED BIBLIOGRAPHY

- Suggested bibliography: (in Greek)

1. Precision Nutrition, The Science and Promise of Personalized Nutrition and Health, 1st Edition - November 1, 2023, Editors: David Heber, Zhaoping Li, José Ordovas, Paperback ISBN: 9780443153150
2. Nutrients, Special Issue Reprint, Precision Nutrition, Edited By: Andreu Palou, Barbara Reynés, mdpi.com/books/pdfview/book/7381, ISBN 978-3-0365-7484-4 (hardback), ISBN 978-3-0365-7485-1 (PDF)
3. <https://foodinsight.org/personalized-nutrition-ready-for-prime-time/>
4. <https://nutritionforprecisionhealth.org/>

Related scientific journals

- Nutrients
- The Journal of Nutrition
- Current Nutrition Reports
- Nutrition Today
- Journal of Nutrition and Health
- Advances in Nutrition
- The proceedings of the nutrition society
- International journal of food science and Nutrition

COURSE OUTLINE

(1) GENERAL

SCHOOL	FOOD SCIENCES		
ACADEMIC UNIT	FOOD SCIENCE AND TECHNOLOGY		
LEVEL OF STUDIES	UNDERGRADUATE		
COURSE CODE	7055	SEMESTER	7
COURSE TITLE	COMPUTATIONAL CHEMISTRY AND CHEMINFORMATICS IN FOOD SCIENCE		
INDEPENDENT TEACHING ACTIVITIES <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>	WEEKLY TEACHING HOURS	CREDITS	
Lectures	2	3	
TOTAL	2	3	
<i>Add rows if necessary. The organization of teaching and the teaching methods used are described in detail at (d).</i>			
COURSE TYPE <i>general background, special background, specialized general knowledge, skills development</i>	Special background, skills development		
PREREQUISITE COURSES:	-		
LANGUAGE OF INSTRUCTION and EXAMINATIONS:	GREEK		
IS THE COURSE OFFERED TO ERASMUS STUDENTS	Yes (project, essay writing)		
COURSE WEBSITE (URL)	..		

(2) LEARNING OUTCOMES

<p>Learning outcomes</p> <p><i>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.</i></p> <p><i>Consult Appendix A</i></p> <ul style="list-style-type: none"> • <i>Description of the level of learning outcomes for each qualifications cycle, according to the Qualifications Framework of the European Higher Education Area</i> • <i>Descriptors for Levels 6, 7 & 8 of the European Qualifications Framework for Lifelong Learning and Appendix B</i> • <i>Guidelines for writing Learning Outcomes</i>
<p>After the end of this course, students will be able to:</p> <ul style="list-style-type: none"> • understand the basic principles that refer to the scope of computational chemistry and cheminformatics, with a particular emphasis on Food Science, • possess the theoretical scientific background of computational chemistry techniques, to apply them for the study of bioactive compounds existing in food products, • manage chemical compounds' databases (e.g. ZINC20 https://zinc.docking.org/) as well as specific platforms (e.g. FooDB https://foodb.ca/, FermFoodb https://webs.iitd.edu.in/raghava/fermfoodb/index.php), Dr. Duke's Phytochemical & Ethnobotanical Databases https://phytochem.nal.usda.gov/) which compile data related to the chemical composition, properties and biological activity of food products, • apply computational chemistry and cheminformatics software's/tools for the three-dimensional representation of food chemical compounds, for the prediction of their physicochemical properties, their toxicity and their binding mode to protein targets.

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?

Search for, analysis and synthesis of data and information, with the use of the necessary technology
Adapting to new situations
Decision-making
Working independently
Team work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas

Project planning and management
Respect for difference and multiculturalism
Respect for the natural environment
Showing social, professional and ethical responsibility and sensitivity to gender issues
Criticism and self-criticism
Production of free, creative and inductive thinking
.....
Others...
.....

- Search for, analysis and synthesis of data and information, with the use of the necessary technology
- Decision-making
- Working independently
- Team work
- Working in an interdisciplinary environment
- Production of new research ideas
- Production of free, creative and inductive thinking

(3) SYLLABUS

Course Objectives

The aim of the course is the students become familiar with the basic principles and tools of computational chemistry and cheminformatics with applications in Food Science. The course attempts to provide the required scientific background to students, including the following sections:

- Introduction to computational chemistry and cheminformatics
- Online food ingredient resources. Handling and retrieval of information
- Management and preparation of chemical compound databases (chemo-libraries)
- Theoretical background of computational chemistry tools
- Application of specific software's for the design of three-dimensional illustrations of chemical compounds
- Prediction of structural and physicochemical parameters of food components, by performing specific software's
- Quantitative structure-activity relationship models (QSAR models)
- Applications of computational techniques in food products, to correlate the activity of food ingredients with physicochemical-structural parameters
- Computational Chemistry Techniques: Virtual Screening chemo-libraries, Pharmacophore model, Molecular Docking studies, Molecular Dynamics Simulations
- Combinatorial techniques for the discovery of novel bioactive compounds against biological targets.
- Exploration of mechanisms bioactivity.

Additionally, the course teaching includes practical applications of computational chemistry and cheminformatics software's in targeted examples associated with Food Science.

(4) TEACHING and LEARNING METHODS - EVALUATION

<p>DELIVERY <i>Face-to-face, Distance learning, etc.</i></p>	<p>Face to face / Additionally with distance learning</p>	
<p>USE OF INFORMATION AND COMMUNICATIONS TECHNOLOGY <i>Use of ICT in teaching, laboratory education, communication with students</i></p>	<p>Use of Information Technologies in Teaching, Laboratory Education and Communication. Informing students via Web, communication with students via e-mail.</p>	
<p>TEACHING METHODS <i>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.</i></p> <p><i>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</i></p>	<p>Activity</p>	<p>Semester workload</p>
	<p>Lectures</p>	<p>40</p>
	<p>Study and analysis of bibliography</p>	<p>10</p>
	<p>Essay writing</p>	<p>28</p>
	<p></p>	<p></p>
	<p></p>	<p></p>
	<p></p>	<p></p>
	<p></p>	<p></p>
<p></p>	<p></p>	
<p>Course total</p>	<p>78</p>	
<p>STUDENT PERFORMANCE EVALUATION <i>Description of the evaluation procedure</i></p> <p><i>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</i></p> <p><i>Specifically-defined evaluation criteria are given, and if and where they are accessible to students.</i></p>	<ul style="list-style-type: none"> • Public presentation • Written work • Multiple choice questionnaires, Short-answer questions, Open- ended questions 	

(5) ATTACHED BIBLIOGRAPHY

- *Suggested bibliography:*

1. *Lecturers' notes, which will be given to students and posted on the UNIWA Open eClass asynchronous distance learning and e-learning platform.*
2. *Chontzopoulou Eleni, Kiriakidi Sofia, Zoumpoulakis Panagiotis, Mavromoustakos Thomas, Principles in Computational Chemistry (2021), KALLIPOS open academic editions*
3. *Harvey Jeremy, Computational Chemistry (2018), Oxford University Press*

- *Related academic journals:*

ChemMedChem

Journal of Chemical Information and Modeling