STUDY PROGRAM

Αειφορική Γεωργία και Επιστήμη Τροφίμων

DEPARTMENT

School of Agriculture

A9
Course Outlines

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1st Semester

Calculus for agriculture and food science

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS101	SEMESTER	1st Semester
COURSE TITLE	Calculus for agriculture and food science		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon completion of this course, students will be able to:

Understand and apply basic mathematical concepts used in agricultural and biological sciences
Use functions and graphs to model real-world agricultural phenomena
Apply differential and integral calculus to problems related to growth, optimization, and change

Solve elementary linear algebra problems with applications in data analysis and modeling
Develop analytical and quantitative reasoning skills necessary for advanced coursework

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an interdisciplinary environment
Respect for the natural environment
Critical thinking

3. COURSE CONTENT

Real numbers and algebraic expressions.
Linear and nonlinear equations.
Definition and types of functions (polynomial, rational, exponential, logarithmic, trigonometric functions).Graphical representation of a function and interpretation. Applications of functions in agricultural and biological contexts.
Sequences and Series of numbers.
Limit and continuity of a function. Practical interpretation of limits in applied problems.
Elements of Differential Calculus: Derivative of a function, rules and techniques of differentiation. Higher-order derivatives.
Applications of Differential Calculus [study of a function and its graphical representation, rates of change, growth models, and optimization problems (maxima and minima)]. Applications of derivatives in agricultural and biological contexts.
Elements of Integral Calculus: Indefinite integral, definite Integral, fundamental theorem of Calculus, rules and techniques of integration. Applications of Integral Calculus (area under curves, curve lengths, surfaces after rotation, accumulated quantities).
Numerical integration (trapezoidal, Simpson). Applications of integrals in agricultural and biological contexts.
Elements of Differential Equations: Dynamic systems, definition and order, ordinary differential equations, first-order differential equations, linear differential equations, homogeneous differential equations, separable equations. Applications of Differential Equations in agricultural and biological contexts.
Elements of multivariable Calculus: Functions of two variables, surface plots, contour plots and level curves, partial derivatives.
Applications of multivariable Calculus in agricultural and biological contexts.
Elements of Linear Algebra: Vectors and matrices, matrix operations, determinants and systems of linear equations.
Applications of matrices in agricultural data analysis.
Elements of Combinatorics: Basic counting principles, permutations, permutations of all elements, combinations.
Elements of Probability Theory: Random experiment, definitions of Probability, rules of Probability, conditional Probability, Bayes Theorem.

Mathematical Modeling in Agriculture (simple mathematical models, examples from crop growth, population dynamics, and resource optimization).

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching Use of ICT in Laboratory Teaching Use of ICT in Communication with Students Use of ICT in Student Assessment Moodle platform: elearning.auth.gr: educational materials available to students along with exercises and projects. AuTH open courses and teachers' personal webpages. Teaching with electronic presentations (slides, video, multimedia, educational software etc.) Laboratories/workshops using computer systems especially on the use of Statistical and Mathematical Software. Communication via elearning.aut.gr and email. Final test grading assisted by electronic means (e.g. on line quizzes).
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	65
BibliographyAnalysis	50
Seminars	4
Tutoring	25
StudyCreation	14
writingProject	6
Examinations	4
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Concluding Assessment Written Exam with Multiple Choice Questions Written Exam with Short Answer Questions Written Exam with Extended Answer Questions Written Exam with Problem Solving **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Summative) • ShortAnswerQuestions (Summative) • EssayDevelopmentQuestions (Summative) • ProblemSolving (Summative) • Presentation (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

-

Additional bibliography for study

Stewart, J. (2016). Calculus: Early transcendentals (8th ed.). Cengage Learning. Boston, MA, United States
Edelstein-Keshet, L. (2005). Mathematical models in biology. SIAM. Philadelphia, PA, United States.

Barnett, R. A., Ziegler, M. R., & Byleen, K. E. (2014). Applied calculus for business, economics, life sciences, and social sciences (12th ed.). Pearson Education. Boston, MA, United States.

Boylestad, R. L. (2012). Introductory differential equations (9th ed.). John Wiley & Sons. Hoboken, NJ, United States.

General Chemistry

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS102	SEMESTER	1st Semester
COURSE TITLE	General Chemistry		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Danzer, K. (2007). Analytical chemistry: Theoretical and metrological fundamentals. Springer Berlin Heidelberg. https://doi.org/10.1007/b103950
Vančik, H. (2014). Basic organic chemistry for the life sciences. Springer International Publishing. https://doi.org/10.1007/978-3-319-07605-8

General Skills Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Practical application of knowledge Search, analysis and synthesis of data and information, ICT Use Adaptation to new situations Decision making Autonomous work Equity and Inclusion Critical thinking Promoting free, creative and inductive reasoning	

3. COURSE CONTENT

Atomic Theory and Bonding: Students learn about the structure of atoms, the periodic table, chemical bonds (ionic and covalent).
Chemical Reactions: The course covers stoichiometry, reaction rates, chemical equilibrium, and redox reactions. Ionic and acid-base equilibria, pH calculations, and buffer solutions
Thermodynamics and Kinetics: Foundational principles of chemical thermodynamics and kinetics are introduced, including enthalpy and free energy.
Properties of matter: Properties of gases, liquids, and solids, solutions, intermolecular forces.
Acids and Bases: The chemistry of acids and bases, including ionic equilibrium, is a core component.
Coordination Chemistry: Some courses may introduce the basics of coordination compounds, which are relevant to understanding how metals function in soil and biological systems.
Basic Analytical Chemistry: Laboratory techniques Sample preparation, Gravimetric analysis, Volumetric analysis (titrations acid-base, redox to determine the concentration of a solution), basic Instrumental methods.
Introduction to the chemistry of biomolecules: Nomenclature of organic compounds, structure, properties of basic organic compounds focusing on the amino acids, peptides, proteins, enzymes, carbohydrates and lipids.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description**

– Use of ICT in teaching
– Use of ICT in Teaching, in Laboratory Education
– Use of ICT in communication with students
– Use of ICT in evaluation of students

TEACHING ORGANIZATION
The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	26
Laboratory	39
Other	30
writingProject	28
BibliographyAnalysis	42
Examinations	3
Total	**168**

STUDENT EVALUATION
Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description
Methods: Formative – Written exam with short-answer questions – Written exam with essay development questions – Written exam with multiple-choice questions – Written exam with problem-solving – Presentation in audience – Essay for field exercise

Student Evaluation Languages
English

Student evaluation methods

- ShortAnswerQuestions (Formative)
- EssayDevelopmentQuestions (Formative)
- MultipleChoice (Formative)
- ProblemSolving (Formative)
- PublicPresentation (Formative)
- WrittenAssignment (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Danzer, K. (2007). Analytical chemistry: Theoretical and metrological fundamentals. Springer Berlin Heidelberg. https://doi.org/10.1007/b103950

Vančik, H. (2014). Basic organic chemistry for the life sciences. Springer International Publishing. https://doi.org/10.1007/978-3-319-07605-8

Informatics

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS103	SEMESTER	1st Semester
COURSE TITLE	Informatics		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Knowledge
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

By the end of this course, students will be able to:
Describe the basic concepts of computer science and explain the role of digital technologies in modern agriculture.
Understand the architecture and functioning of computer systems, including hardware components, operating systems, and peripheral devices.
Use essential software tools such as word processors, spreadsheets, presentation software, and databases to support agricultural tasks.
Apply spreadsheet analysis techniques (formulas, functions, charts, data management) to solve problems relevant to agricultural production and research.

Manage and analyse agricultural data using basic data processing tools and introductory statistical functions.
Understand the principles of networks and the Internet, including cloud services, online collaboration tools, and digital communication.
Apply good practices of digital security and data protection, including safe browsing, file management, backup, and cybersecurity awareness.

Recognise key digital technologies in agriculture and farm management information systems (FMIS).
Work collaboratively using digital platforms, demonstrating effective communication, sharing, and project management skills.
Evaluate digital tools and software for their suitability, accuracy, and usefulness in addressing agricultural problems.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Autonomous work

3. COURSE CONTENT

Introduction to Informatics
Role of informatics in agricultural science
Basic concepts: data, information, systems
ICT applications in agriculture
Computer Systems and Hardware
Components of a computer (CPU, memory, storage, I/O devices)
Operating systems
Peripheral devices used in agriculture (sensors, GPS receivers, mobile devices)
Software Tools for Agricultural Tasks
Word processing and report preparation
Spreadsheet fundamentals (data entry, formatting, formulas)
Presentation software for academic and professional use
Introduction to database concepts
Spreadsheet Analysis for Agriculture
Functions, formulas, lookup tables
Data sorting, filtering, and validation
Charts and visualisation techniques
Application examples: budgeting, yield calculations, farm datasets
Introduction to Data Management and Analysis

Types of agricultural data
Basic statistics using digital tools
Data cleaning and organisation
Simple automation (macros, scripts)
Computer Networks and the Internet
Fundamentals of networks (LAN, WAN, protocols)
Cloud computing and online collaboration
Email, communication tools, and academic platforms
Digital ethics and responsible online behaviour
Cybersecurity and Data Protection
Threats, malware, and safe browsing
Password management and authentication
Backup strategies and data recovery
Data privacy and GDPR basics (relevant to agricultural data)
Digital Technologies in Modern Agriculture
Precision agriculture
Remote sensing and imagery
Farm Management Information Systems (FMIS)
Internet of Things (IoT) in agriculture
Practical Workshops and Case Studies
Hands-on exercises with spreadsheets, GIS, online tools
Digital solutions for farm planning and monitoring
Small project integrating course skills

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Teaching Use of ICT in Laboratory Education Use of ICT in Communication with students Use of ICT in Evaluation of students Use of powerpoint. Laboratory exercises on the computer lab. Communication via email and online exams.
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.	

Activity	Workload/semester
Lectures	65
BibliographyAnalysis	13
InteractiveLearning	39

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
writingProject	48
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Method Formative Student Evaluation Languages English Computer Assisted Exam 100% **Student Evaluation Languages** English **Student evaluation methods** • ComputerExamination (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

O'Leary, T. J., O'Leary, L. I., & O'Leary, D. (2024). Computing Essentials 2025 (2024 Release). McGraw-Hill Higher Education. ISBN 9781265700171

Bioethics, Governance and Animal Welfare in Agri-Food Systems

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS104	SEMESTER	1st Semester
COURSE TITLE	Bioethics, Governance and Animal Welfare in Agri-Food Systems		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

The learning outcomes of the course, concerning knowledge acquired (K), skills developed (S), and abilities cultivated (A) are summarized below.
Following successful completion of the course, students will be able to:
Introduce the core principles of bioethics and their relevance to sustainability (K).
Explain the Sustainable Development Goals (SDGs) as a global framework for development.
Assess governance frameworks in alternative food supply chains (K)
Identify key SDGs related to agrifood systems (S).
Explore the ethical dimensions of selected SDGs related to food, agriculture, and farming systems (K, A).

Define bioethics and explain its relevance to sustainable development (K).
Examine trade-offs and ethical dilemmas in achieving sustainability in agrifood systems (K, S).
Analyze complex dilemmas in agrifood systems (K, S)
Understand the rythmetic role of NGOs and agricultural cooperatives in the agri food chain (K, A)
Analyze and ethically evaluate real-world bioethical dilemmas in contemporary agriculture, including technological innovation, intensification, animal welfare, and sustainability trade-offs, using established ethical frameworks (K, S).
Assess the role of bioethics in shaping public trust, social acceptance, and stakeholder engagement in agri-food systems, with emphasis on transparency, accountability, and participatory governance (K, A).
Be familiar with the E.U. regulations for food safety and welfare policies (K, S).
Understand animal sensory systems that modulate animal behavior and evolutionary behavioral biology (K, S)
Observe and evaluate ethological patterns of the intensively raised farm animals (K, S).
Develop and implement specialized welfare protocols for the livestock Industry (S, A).
Assess the efficiency of the welfare protocols (A)
Disseminate the results of effective husbandry practices to stakeholders (A)

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Decision making
Autonomous work
Teamwork
Project design and management
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

The syllabus of the course will cover the following thematic sections:
Bioethics in Agriculture: Ethical Governance Frameworks in Crop and Livestock Production.
From Farm to Markets: Civil Society, Agricultural Cooperatives and Fair Food Supply Chain.
17 United Nations Sustainable Development Goals: A systems approach to Food and Agriculture.
Global Food Governance and Market Transformations. International Organizations and Trade Ethics (NGOs, FAO, WTO).
European and National Legislation (directives) on bioethics and animal welfare.
Applied Ethics and Bioethical Dilemmas in Contemporary Agriculture
Bioethics, Public Trust, and Social Acceptance of Agri-Food Systems
Bioethics, Sustainability and Accountability in Agricultural and Livestock Enterprises: Governance Tools for Ethical Decision-Making

Managing Welfare, Technology and Stakeholder Expectations.
Methods of assessment welfare index by the evaluation of the ethological patterns. Integration of welfare assessments into farm management decisions to enhance productivity, animal health, and product quality.
Implementation of the welfare protocol especially on the intensive livestock units. Presentation of the five Freedoms axiom and the concept of the three Rs. An introduction to the various means animals uses to send signals to each other and how these signals are influenced by the environment and social context.
Presentation of exogenous and endogenous stimuli that affect physiological, biochemical and other functional parameters which in turn determine the welfare status of the animals (especially farm animals). Different ethological patterns among various species. Grazing behavioral pattern. Maternal behavioral pattern. Social activities and behavioral responses among males and females. Abnormal behavior and behavioral patterns under captivity (red deer - Cervus elaphus-, wildboar - Sus scrofa- and brown bear - Ursus arctus).
Communication strategies for advising farmers and stakeholders on the implementation of welfare improvements and compliance with legislation.
Visit to livestock and wield animals units.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching (digital presentations, audiovisual material) Use of ICT in Laboratory Teaching (digital presentations, audiovisual material, web searching) Use of ICT in Communication with Students Use of ICT in Student Assessment
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	65
StudyVisits	16
BibliographyAnalysis	17
writingProject	36
StudyCreation	17
Other	11
Examinations	6
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** - **Student Evaluation Languages** English **Student evaluation methods** • EssayDevelopmentQuestions (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

Additional bibliography for study

1. D. M. Broom and A.F. Fraser. Domestic Animal Behaviour and Welfare. 4Th Ed. CAB International 2007. ISBN: 9781845932879
2. K. A. Houpt. Domestic Animal Behavior. 4Th Ed. Culinary and Hospitality Industry Publications Services, 2005.
3. Beauchamp, Tom L., and R. G. Frey (eds), The Oxford Handbook of Animal Ethics, Oxford Handbooks (2011); online edn, Oxford Academic, https://doi.org/10.1093/oxfordhb/9780195371963.001.0001.
4. Thompson, B.P (2020). Food and Agricultural Biotechnology in Ethical Perspective, Springer, https://doi.org/10.1007/978-3-030-61214-6
5. Vinnari, E. 2023. Sustainable governance and management of food systems: Ethical perspectives" BRILL 2023. https://books.google.gr/books?id=97BxEQAAQBAJ
Textbook Title: ANIMAL BEHAVIOR
Year Published: 5/2019 Authors: Rubenstein R. Dustin, Alcock John ISBN: 9781605358949
Publisher: Oxford University Press

The sociology of food: cultural and social dimensions of Mediterranean Gastronomy

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS105	**SEMESTER**	1st Semester
COURSE TITLE	The sociology of food: cultural and social dimensions of Mediterranean Gastronomy		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	3	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Knowledge
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

The learning outcomes of the course, concerning knowledge acquired (K), skills developed (S), and abilities cultivated (A) are summarized below.
After successful completion of the course, students will be able to:
Explain how Food Democracy operates (K).
Explore how sustainable agritourism is driving change for people, the planet and prosperity in the Mediterranean (K/S)
Acknowledge the Med Gastronomy's deep social and cultural relevance as an intangible cultural heritage of humanity (K)
Identify and evaluate UNESCO's food designations, considering social sustainability challenges and power dynamics (K, S).
Apply principles of ethical food systems (K, S).

Conduct analytical assessments of traditional food systems, integrating economic, environmental, and social-impact criteria with attention to equity and resilience (K, S).
Analyze the role of gastronomy (K, S).
Design resilient food systems that empower rural women (S).
Develop and evaluate tools for promoting the Mediterranean Gastronomy (S).
Safeguarding the Mediterranean's rich cultural and natural heritage, positioning the region as a leader in sustainable development (A)
Develop and test value propositions for locally grounded food systems (S, A).
Make informed decisions under uncertainty, using evidence, participatory analysis for transformative action (A).
Collaborate effectively in interdisciplinary teams (A).

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Decision making
Autonomous work
Teamwork
Project design and management
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

The course focuses on covers the relationship between food and society, examining topics like food production, distribution, and consumption from sociological perspectives as well as the transformation of agrifood systems to be more sustainable, resilient, and equitable based on the Mediterranean gastronomy rooted in cultural and ethical practices. Key content areas include how food is shaped by social factors like class, gender, and ethnicity; the impact of globalization on food systems; especially in the Mediterranean and the symbolic, cultural, and political meanings of Med gastronomy. Course also analyze social issues related to food, such as inequality, sustainability, and the rise of social movements like fair trade, slow food and urban agriculture.
(1st- 2nd week) Food and social structure:
How class, gender, race, ethnicity, age, and religion influence food choices and habits.
The role of food in creating and reinforcing social inequalities.
How food is used as a marker of identity and social status.
Critical analysis of alternative food movements, such as slow food, farm-to-table, and fair trade.
(3rd and 4th week) Food production and distribution:
The social and political dynamics of modern food systems, from farm to fork.
The sociology of labor in agriculture and food processing.

Issues of food security, hunger, and access, including the concept of "food deserts" and zero food miles
The impact of globalization on food systems
(5th and 6th week) Food consumption and culture in the Mediterranean:
The symbolic meanings of food, including rituals, traditions, and celebrations.
The role of food in family and community life.
The sociology of taste and how it relates to social class.
The transformative role of agritourism and the Mediterranean gastronomy
(7th to 11th week) EU geographical indications system (PGI, PDOs etc) food and wine- linked to the cultural gastronomy and the territory of the Mediterranean region
Cultural heritage: PDO and PGI products are tied to generations of history, tradition, and specific production methods, often stemming from local and indigenous varieties.
Regional identity: These designations reinforce the unique identity of Mediterranean regions by highlighting their specific products, such as Greek feta cheese or Italian Parmigiano Reggiano.
Link between food and place: The systems connect food to the land, climate, and local flora and fauna, which is a cornerstone of the Mediterranean diet's philosophy. For example, the unique flavor of Greek feta is directly linked to the diverse local flora grazed by the sheep and goats.
Sustainable practices: The PDO/PGI system encourages sustainable agriculture and safeguards biodiversity, as seen in initiatives promoting eco-districts and organic farming in Mediterranean regions.
Economic value: By protecting these products, the EU system provides economic benefits to farmers and rural communities, while guiding consumers toward authentic goods.
(12th -13th week) Project's presentation

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching (digital presentations, audiovisual material) Use of ICT in Laboratory Teaching (digital presentations, audiovisual material, web searching) Use of ICT in Communication with Students Use of ICT in Student Assessment
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	39
FieldExercise	10
BibliographyAnalysis	30
StudyCreation	50
writingProject	36

Activity	Workload/semester
Examinations	3
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

Written Exam with Multiple Choice Questions (Formative, Summative) Written Exam with Short Answer Questions (Formative, Summative) Written Exam with Extended Answer Questions (Formative, Summative) Written Assignment (Formative, Summative) Oral Exams (Formative, Summative) Performance / Staging (Formative, Summative) Written Exam with Problem Solving (Formative, Summative)

Student Evaluation Languages

English

Student evaluation methods

- MultipleChoice (Formative, Summative)
- ShortAnswerQuestions (Formative, Summative)
- EssayDevelopmentQuestions (Formative, Summative)
- WrittenAssignment (Formative, Summative)
- OralExam (Formative, Summative)
- Other (Formative, Summative)
- ProblemSolving (Formative, Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

-

Additional bibliography for study

Poulain, Jean Pierre. (2017). The Sociology of Food: Eating and Place of Food in Society. Bloomsbury
Partalidou, M. & De Matteis, L. 2024. Sustainable agritourism: an opportunity for agrifood systems transformation in the Mediterranean – Technical brief. Rome, FAO.
https://www.oneplanetnetwork.org/programmes/sustainable-food-systems/sfs-med-platform
Agriculture in Mediterranean Europe Between Old and New Paradigms (2013). Dionisio Ortiz Miranda|Eladio Vicente Arnalte Alegre|Ana Maria Moragues Faus. (Research in Rural Sociology and Development, 19). Emerald

Mediterranean Biodiversity, Climate Change and Circular Economy

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS106	**SEMESTER**	1st Semester
COURSE TITLE	Mediterranean Biodiversity, Climate Change and Circular Economy		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	4	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successfully completing the course, students will be able to:
1. Know the basic principles and definition of biodiversity.
2. Recognize the basic Mediterranean species of high economic and ecological importance
3. Describe the unique features of temperate latitudes that support Mediterranean cultivation, farming and aquaculture
4. Discriminate invasive from alien species
5. Evaluate the effect of invasive species in the local biocommunities.
6. Recognize the potential and benefits of circular economy in food production systems.
7. Analyze the environmental risks from different forms of climate change in the physiology of plants and animals

8. Explain the terms “heat stress”, “biological pollution” and “biofouling”
9. Make decisions taking into consideration Natura 2000 network, Ramsar Convention and other protected areas regulations
10. Know the basic Mediterranean local plant verities, indigenous farm animal breeds and endemic species

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Module 1: Biodiversity, evolution, local adaptation and conservation biology
Module 2. Invasive, endemic and endangered species in the Mediterranean. IUCN red list of threatened species
Module 3: The effect of climate change on living organisms – heat stress and productivity reduction
Module 4: Interactions of Mediterranean environment, ecological management and sustainability
Module 5: Basic principles of circular economy
Module 6: Main cultivated, farmed and cultured species in the Mediterranean – benefits and risks
Module 7: Stress, Oxygen - Metabolism - Energetics, Homeostasis
Module 8: Introductions and environmental risks
Module 9: Waste and by products reuse and management
Module 10: Mediterranean ecosystems sustainability, risks and management
Module 11: Natura 2000 network, Ramsar Convention and protected areas regulations
Module 12: Introduction to Mediterranean production systems
Module 13: Project assignment

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD	Face to face

<table>
<tr><td>Face to face, Distance learning, etc.</td><td></td></tr>
<tr><td>USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)
Use of ICT in Teaching, in Laboratory Education, in Communication with students</td><td>USE OF ICT
• Use of ICT in Teaching
• Use of ICT in Laboratory Education
• Use of ICT in Communication with students
Description
Use of ICT in Teaching, in Laboratory Education and in students projects assignment</td></tr>
<tr><td>TEACHING ORGANIZATION
The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards</td><td>
<table>
<tr><th>Activity</th><th>Workload/semester</th></tr>
<tr><td>Lectures</td><td>39</td></tr>
<tr><td>Laboratory</td><td>13</td></tr>
<tr><td>BibliographyAnalysis</td><td>77</td></tr>
<tr><td>writingProject</td><td>13</td></tr>
<tr><td>StudyCreation</td><td>23</td></tr>
<tr><td>Examinations</td><td>3</td></tr>
<tr><td>Total</td><td>168</td></tr>
</table>
</td></tr>
<tr><td>STUDENT EVALUATION
Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed</td><td>Description
• Final written exam – 60% • Project / Laboratory work – 30% • Participation and assignments – 10%
Student Evaluation Languages
English

Student evaluation methods
• EssayDevelopmentQuestions (Summative)
• LaboratoryReport (Summative)
• WrittenAssignment ()</td></tr>
</table>

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

Additional bibliography for study

• The Biology of Mediterranean-Type Ecosystems (Biology of Habitats Series) Illustrated Edition by Karen J. Esler (Author), Anna L. Jacobsen (Author), R. Brandon Pratt (Author), Publisher: Oxford University Press
• The Mediterranean Sea, Stefano Goredo, Zvy Dubinsky, Editors, Its history and present challenges, Publisher: Springer

2nd Semester

Physics applied in Agrifood sector

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS201	SEMESTER	2nd Semester
COURSE TITLE	Physics applied in Agrifood sector		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, students will acquire comprehensive knowledge of
Apply basic physics principles (mechanics, thermodynamics, electromagnetism, optics) to agricultural and food-related systems.
Explain how physical laws govern soil behavior, water flow, heat transfer, and plant-environment interactions.
Understand soil–water–plant interactions using physical models (hydraulics, diffusion, capillarity).
Understand light interception, photosynthesis, and effect of light on crop growth and development

Apply radiation and optics to agricultural imaging and crop monitoring.
Explain physical processes in food preservation, including phase transition phenomena.
Interpret signals from measurement instruments used in precision agriculture and food quality assessment.
Understand the fundamental principles of colloids and interfacial phenomena in agro-food systems and will be able to relate these principles to the structure, stability, and functional properties of food products.
Integrate physical models to solve real-world agrifood challenges, from soil management to food quality and shelf-life.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Search, analysis and synthesis of data and information, ICT Use
Autonomous work
Teamwork
Production of new research ideas
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

The course provides students with an in-depth understanding of:
1. Soil Physical Phases & Structure
2. Soil Water: Suction, Potential, Movement
3. Soil Air, Gas Exchange & Soil Thermal Regime
4. Water Transport in Plants & Biophysics of Xylem
5. Light, Radiation & Photosynthetic Physics
6. Plant Mechanical Properties & Biomechanics
7. Fundamental Physicochemical Principles in Food Systems
8. Thermodynamics of Food Systems
9. Biopolymers
10. Water in Foods – Activity, Phase Transitions
11. Reaction Kinetics and Shelf-Life Prediction
12. Colloids and Interfaces in Agro-Food Systems
13. Rheology & Texture of Foods

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face

USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)

Use of ICT in Teaching, in Laboratory Education, in Communication with students

USE OF ICT

- Use of ICT in Teaching
- Use of ICT in Communication with students

Description

e-learning.auth.gr: educational materials available to students and communication with the students
Teaching with electronic presentations (slides, video, etc.)

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Seminars	13
Laboratory	13
FieldExercise	8
BibliographyAnalysis	22
writingProject	24
StudyCreation	46
Examinations	3
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

80% Written Examinations 10% Project Work 10% Project Presentation Assessment Methods: Written Examination with Multiple Choice Questions Written Examination with Short Answer Questions Written Assignment Public Presentation Students are informed of the detailed evaluation criteria via the e-learning platform

Student Evaluation Languages

English

Student evaluation methods

- MultipleChoice (Formative)
- ShortAnswerQuestions (Formative)
- WrittenAssignment (Formative)
- PublicPresentation (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

-

Additional bibliography for study

Fundamental Principles of Environmental Physics 2025. By Abel Rodrigues, Raul Albuquerque Sardinha, Gabriel Pita
Principles of Environmental Physics: Plants, Animals, and the Atmosphere 2013. 4th Edition, by John Monteith, Mike Unsworth
Physical Chemistry of Foods, 2003. By Pieter Walstra.
Food Physics, 2023. By Ludger O. Figura, Arthur A. Teixeira.

Statistics and Biometry

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS202	SEMESTER	2nd Semester
COURSE TITLE	Statistics and Biometry		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon completion of this course, students will be able to:
Recognize the role, importance, and significance of "variability" and "uncertainty" in the world we live in, and understand how Statistics - Biometry can contribute to making better decisions under conditions of uncertainty (through real life practical examples and discussion).
2. Acquire knowledge of a wide range of statistical concepts, techniques, and tools that are useful in statistical and biometrical applications (from theory to real life applications and case studies).
3. Develop critical thinking regarding the application of Statistics and Biometry in the Biological Sciences (through real life practical examples and discussion, working on case studies and projects).

4. Acquire knowledge a) regarding the decisions that must be made during the design and establishment of an experiment and b) regarding the available options and methodological approaches for the statistical analysis of experimental data (from theory to real life applications and case studies, working on projects).
5. Develop practical skills and competencies in performing statistical analyses. Develop critical thinking abilities concerning the biological significance and interpretation of statistical results (from theory to real life applications and case studies, working on projects).
6. Develop the ability to present experimental results in a form suitable for dissemination within the scientific community (from theory to real life applications and case studies, working on projects).

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

About Data:

Data, Information, Knowledge; variables; probability distributions; variability; population; sample; census and sampling surveys; sampling methods (random and non-random); sample representativeness; sample size.

Principles of Scientific Research:

Experimental studies. Correlational studies. Types of research hypothesis. Types of variables (nominal, ordinal, interval, ratio, binary with 0/1 coding, continuous, discrete).

Descriptive Statistics:

Absolute and relative frequencies; cumulative absolute and relative frequencies; variance and standard error of proportions; minimum, maximum, range, mean, median, mode; variability–variance–dispersion; standard deviation; coefficient of variation (CV); standard error of the mean; quartiles (Q1=Q25, Q2=Q50, Q3=Q75); interquartile range; semi-interquartile range. Weighted means; harmonic and geometric means. Data transformations (log, z-scores). Coefficients of skewness and kurtosis.

Presentation of Results:

Tables with frequencies or other statistical indicators (one-way and two-way). Graphs (bar charts, line charts, box plots, histograms, scatter plots), simple and comparative.

Probability Theory:

The concept of probability; set theory; combinations, permutations, arrangements and other tools; estimation and calculation of probabilities; laws and theorems; probability algebra; probability distributions; random variables (types of variables, expectations–expected values).

Theoretical Distributions:

For discrete random variables: Bernoulli, Binomial, Poisson, Multinomial. For continuous random variables: Normal, Standard Normal,Uniform, Exponential, Log-normal.

Statistical or Empirical Distributions:

Chi-square distribution, t-distribution, F-distribution. Determination of critical/theoretical values.

Confidence Intervals:

For the mean of a population; for a population proportion; for population variability/variance. For the difference of means between two populations (3 cases: two for independent samples, one for paired samples). For the difference of two population proportions (independent samples). For the ratio of two population variances/variabilities (independent samples). Assumptions and presuppositions. Calculation of the Minimum Required Sample Size.

Hypothesis Testing (Statistical Tests):

For a population mean; for a population proportion; for population variability/variance. For the difference of means between two populations (3 cases: 2 for independent samples, 1 for paired samples). For the difference of two population proportions (2 cases: 1 for independent samples, 1 for paired or correlated samples). For the ratio of two population variances/variabilities (independent samples). Chi-square independence test, chi-square test of homogeneity, chi-square goodness-of-fit test. Assumptions and presuppositions. Type I error, Type II error, Type 0 or Type II½ error, statistical power.

Exploring the Association Between Two Variables:

For categorical variables: Chi-square test, contingency tables of absolute and relative frequencies, association coefficients (Cramer's V, Pearson's phi). For quantitative variables: scatter plots, correlation coefficients (Pearson, Spearman). Simple linear regression. Assumptions and presuppositions.

Analysis of Variance (ANOVA):

One-way ANOVA. Two-way ANOVA. ANOVA table. Multiple comparisons of means. Assumptions and presuppositions.

Non-parametric Tests:

Mann–Whitney test, Wilcoxon test, Kruskal–Wallis test. Assumptions and presuppositions.

Experimental Designs/Conducting Experiments:

Introduction to agricultural experimentation. Purpose of agricultural experimentation. Field experiments, greenhouse experiments, laboratory experiments. Randomization, replication, formation of experimental groups, experimental units and observation units. Methodology for establishing agricultural experiments. Introduction to analysis of variability. Statistical significance tests. Experimental error. Completely randomized design. Mean comparisons. Randomized complete block design. Latin square design. Factorial experiments. Main effects and factor interactions. Introduction to linear correlation. Introduction to regression analysis. Data transformations. Examples and applications. Demonstration of statistical software. Practical training in designing field experiments.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching Use of ICT in Laboratory Teaching Use of ICT in Communication with Students Use of ICT in Student Assessment Moodle platform: elearning.auth.gr: educational materials available to students along with exercises and projects. AuTH open courses and teachers' personal webpages. Teaching with electronic presentations (slides, video, multimedia, educational software etc.) Laboratories/workshops using computer systems, especially in the use of Statistical and Mathematical Software. Communication via elearning.aut.gr and email. Final test grading assisted by electronic means (e.g. on line quizzes).

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	65
BibliographyAnalysis	50
Seminars	4
Tutoring	25
StudyCreation	14
writingProject	6
Examinations	4
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

Assessment Language: English Concluding Assessment Written Exam with Multiple Choice Questions Written Exam with Short Answer Questions Written Exam with Extended Answer Questions Written Exam with Problem Solving

Student Evaluation Languages

English

Student evaluation methods

- MultipleChoice (Summative)
- ShortAnswerQuestions (Summative)
- EssayDevelopmentQuestions (Summative)
- ProblemSolving (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

-

Additional bibliography for study

Steel, R., Torrie, J. H., & Dickey, D. A. (1997). Principles and procedures of statistics. New York: McGraw-Hill Book.
Gomez, K., & Gomez, A. (1984). Statistical Procedures for Agricultural Research. Singapore: John Willey & Sons.
Clewer, A. G., & Scarisbrick, D. H. (2001). Practical Statistics and Experimental Design for Plant and Crop Science. Chichester: John Wiley & Sons.

Sustainable Field Crop Production

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS203	SEMESTER	2nd Semester
COURSE TITLE	Sustainable Field Crop Production		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon completion of this course, students will:
1. Be familiar with the species, the structure and the function of the most important field crops that are important for human nutrition.
2. Learn the physiology of field crops.
3. Understand how the environment affects the development of the field crops (climate, soil).
4. Identify the noxious weeds of field crops and comprehend the principles of integrated weed management.
5. Understand the importance of fertilization and plant nutrition for crop plants.
6. Know the agricultural practices and the cropping systems applied in field crops.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

1. Introduction (Agriculture as an art and science, agriculture and human nutrition, origin of crop plants, classification of crop plants with different criteria)
2. Structure and physiology of field crops
3. Environment and development of plants – Climate (solar radiation, temperature, rainfall and other precipitation, wind, light, evapotranspiration, photoperiod, the agricultural climate of Mediterranean and distribution of crops)
4. Environment and development of plants - soil, Weeds and biotic factors. 5. Growth, development and yield of crops.
6. Crop rotation.
7. Soil tillage.
8. Plant nutrition and fertilization.
9. Seed and seeding.
10. Cropping systems (monoculture, intercropping, conservation agriculture, sustainable agriculture)
11. Cropping systems (Integrated crop production, organic agriculture, precision agriculture, new technologies in agriculture, good agricultural practices, environmental indices, application of good agricultural practices).
12. Brief presentation of the main field crops that are important for Greece. The products and the quality of these products.
13. Brief presentation of the alternative crops such as aromatic and medicinal plants, energy crops that are important for Greece. The products and the quality of these products.

Practical classes:
1. Seed identification of field crops

2. Identification of field crops at different growth and developmental stage
3. Seed germination, seed quality characteristics that are used for seed control and fertilization.
4. Weed identification of winter and summer species.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students **Description** Use of ICT in Course Teaching Use of ICT in Laboratory Teaching Use of ICT in Communication with Students Use of ICT in Student Assessment elearning.auth.gr : educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.aut.gr and emails,… Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	49
FieldExercise	12
Seminars	4
StudyVisits	14
StudyCreation	14
writingProject	6
Examinations	4
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Process Description: 70% Written Examinations 20% Laboratory Report 10% Project Presentation Assessment Methods: Written Exam with Multiple Choice Questions Written Exam with Short Answer Questions Written Exam with Extended Answer Questions Written Exam with Problem Solving Written Assignment Presentation in audience Report **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Summative) • ShortAnswerQuestions (Summative) • EssayDevelopmentQuestions (Summative) • ProblemSolving (Summative) • LaboratoryAssignment (Summative) • PublicPresentation (Summative) • WrittenAssignment (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Acquaah G. 2011. Principles of Crop Production: Theory, Techniques, and Technology, PHI Learniong Private Limited,
Anderson, W.P. 2007. Weed Science: Principles and Applications. Third edition, West Publishing Co. 388 p.
Monaco, J.T., S.C. Weller and F.M. Ashton. 2002. Weed Science: Principles and Practices, 4th ed. John Wiley and Sons, Inc. New York. 671 p.

Living Systems and Molecular Biology

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS204	SEMESTER	2nd Semester
COURSE TITLE	Living Systems and Molecular Biology		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Knowledge
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon completion of this course, students will:
Describe the characteristics, structure, and function of living organisms.
Explain molecular and cellular processes such as metabolism, photosynthesis, and cell division.
Understand the principles of genetics and heredity.
Explain the mechanisms of evolution and natural selection.
Identify major groups of organisms and their evolutionary relationships.
Analyze ecological interactions between organisms and their environments.
Apply scientific reasoning and evaluate biological data.

Conduct basic laboratory experiments using proper techniques and safety protocols.
Identify the various components of the cellular machinery that retain and express the genetic information stored in the cells of living organisms.- Understand the basic methods and approaches used in molecular biology.- Explain the role played by the molecular components of the genetic mechanism.- They use their knowledge about the structure and function of macromolecules in the interpretation of biological phenomena such as growth, development and responses to biotic and abiotic stimuli.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Introduction to Biology.
Biological macromolecules (carbohydrates, lipids, proteins, nucleic acids)
Cell Structure and Function
Energy and Metabolism
Membrane Dynamics & Cell Communication
Cell Cycle & Cell Division
DNA Structure & Gene Expression
DNA mutations, repair mechanisms, transposons and DNA polymorphisms
Biotechnology & Genomics
genomic analysis, -omic technologies and bioinformatics
Introduction to Evolution
Diversity of Life: Microorganisms
Diversity of Life: Plants
Diversity of Life: Animals

Molecular Cytogenetics
Genetic modification & GMO organisms
Genome editing technology

Lab sessions
Scientific method & microscopy, Pipetting, spectrophotometry, gel electrophoresis
Properties of water
Enzymes and reaction rates
DNA extraction & PCR
Gene expression analysis (RT-qPCR or reporter assays)
Bacterial transformation or CRISPR-based editing
Protein purification & enzyme kinetics
Bioinformatics: genome annotation & sequence analysis
Systems biology: network modeling in Python or MATLAB

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students **Description** Use of ICT in Course Teaching Use of ICT in Laboratory Teaching Use of ICT in Communication with Students Use of ICT in Student Assessment elearning.auth.gr : educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.aut.gr and emails,… Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	55
Tutoring	22
writingProject	23
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Formative or Concluding, Multiple Choice Test, Short Answer Questions, Problem Solving, Written Assignment, Presentation in audience, Laboratory Report **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Formative) • ShortAnswerQuestions (Formative) • EssayDevelopmentQuestions (Formative) • ProblemSolving (Formative) • WrittenAssignment (Formative) • PublicPresentation (Formative) • LaboratoryAssignment (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Concepts of Biology — Samantha Fowler, Rebecca Roush & James Wise (Open Textbook Library)
Biology 2e — Mary Ann Clark, Jung Choi & Matthew Douglas (OpenStax)
Life: The Science of Biology — David E. Sadava et al.
iGenetics - Μια Μεντελική Προσέγγιση, Peter J. Russell. ISBN: 978-960-88412-8-4, Εκδοτικός Οίκος: Ακαδημαϊκές Εκδόσεις (33133214)

Food Chemistry

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS205	**SEMESTER**	2nd Semester
COURSE TITLE	Food Chemistry		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** General Chemistry **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, students are expected to be able to explain the chemical composition of foods and the properties of major constituents such as water, proteins, carbohydrates, and lipids. They will be familiar with the micronutrients present in foods, such as vitamins and minerals, as well as with the components that influence organoleptic characteristics and the additives commonly used in food products. They will understand the technological, nutritional, and analytical significance of these constituents and be able to describe their role in the transformations that occur during food processing, cooking, and storage.

General Skills Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Equity and Inclusion
Respect for the natural environment
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Water in food systems (structure and properties; water activity)
Proteins (amino acid/protein structure; denaturation; functional properties)
Lipids (structure and classification; lipid oxidation mechanisms)
Carbohydrates (mono-, di- saccharides; sweeteners; dietary fiber; chemical reactions during processing)
Vitamins and Minerals (water- and fat-soluble vitamins; essential minerals and trace elements; bioavailability)
Colourants (chemical structure; stability during heating, pH, storage)
Flavourings
Food additives (preservatives, stabilizers; emulsifiers)

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description**

– Use of ICT in teaching
– Use of ICT in communication with students
– Use of ICT in evaluation of students

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	65
BibliographyAnalysis	75
Seminars	10
writingProject	15
Examinations	3
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

Methods: Formative – Written exam with short-answer questions – Written exam with essay development questions – Written exam with multiple-choice questions – Written exam with problem-solving – Presentation in audience – Essay for field exercise Students are informed about the assessment methods during the first lecture and via the e-learning platform.

Student Evaluation Languages

English

Student evaluation methods

- ShortAnswerQuestions (Formative)
- MultipleChoice (Formative)
- EssayDevelopmentQuestions (Formative)
- ProblemSolving (Formative)
- PublicPresentation (Formative)
- WrittenAssignment (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Zeece, M. Introduction to the Chemistry of Food, 2020 (Academic Press, ISBN: 9780128117262)
Belitz, Grosch & Schieberle, Food Chemistry, 4th ed./2009 (HEAL-Link Springer ebooks, ISBN: 9783540699347)

Agricultural Economics

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS206	SEMESTER	2nd Semester
COURSE TITLE	Agricultural Economics		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	3	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Students are expected, upon successful completion of the course, to understand the role of the agrifood sector on the agricultural and national economy, the principles of economics and agricultural economics and the markets structure at national and international level in the whole agrifood sector.
By the end of the course, students will be able to:
Understand the main principles of economics and core economic concepts such as scarcity, choice, opportunity cost, supply, demand, and market equilibrium, and their specific relevance to agriculture.
Analyze market dynamics and how market forces determine prices for agricultural products and interpret the factors that cause price fluctuations.

Understand production theory, analyze production functions, calculate costs (fixed, variable, total), and apply models of profit maximization for a farm enterprise.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Autonomous work
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Introduction to Agricultural Economics. Basic concepts and principles of economic production. structure and current trends in agriculture in Greece, the EU and globally. Agricultural production factors. Production costs, cost of manufacturing and economic results. Agricultural production and prices and agriculture's reliance on natural resources. Agricultural markets and structure. Alternative food supply chains. Competition issues. The role of agricultural cooperatives in empowering small farmers in the agrifood supply chain.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching Use of ICT in Communication with Students elearning.auth.gr : educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) workshops on computer systems, communication via elearning.auth.gr and emails Final test grading assisted by electronic means

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Seminars	15
Other	40
FieldExercise	40
writingProject	31
Examinations	3
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

Written Exam with Multiple Choice Questions (Formative) Written Exam with Short Answer Questions (Formative) Written Exam with Extended Answer Questions (Formative) Oral Exams (Formative) Written Assignment (Formative, Summative)

Student Evaluation Languages

English

Student evaluation methods

- MultipleChoice (Formative)
- ShortAnswerQuestions (Formative)
- EssayDevelopmentQuestions (Formative)
- OralExam (Formative)
- WrittenAssignment (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Handbook of Agricultural Economics (2022). Christopher B. Barrett, David R. Just, Science Direct eds, ISBN: 9780323988858
Andrew Barkley - Paul W. Barkley (2013), Principles of Agricultural Economics, Routledge eds, ISBN-13: 978041554070

3rd Semester

Agrometeorology

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS301	SEMESTER	3rd Semester
COURSE TITLE	Agrometeorology		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Explain the structure and physical properties of the atmosphere and describe their significance for agricultural environments and crop–atmosphere interactions.
Apply the fundamental principles and equations of atmospheric thermodynamics to interpret temperature dynamics, stability conditions, radiation processes, and energy exchanges relevant to agriculture.
Identify and interpret key meteorological variables—temperature, wind, humidity, solar and terrestrial radiation, precipitation—and

evaluate their influence on microclimate, crop development, and animal response.
Analyze satellite data and modern remote-sensing products to extract agro-meteorological information and support regional-scale assessments.
Interpret soil temperature dynamics, soil heat flux, and surface energy balance, assessing their implications for seedbed conditions, germination, and early crop growth.
Operate and evaluate data from meteorological and climatic stations and instruments, including field sensors and automated monitoring systems used in agricultural meteorology.
Process, elaborate, and critically analyze meteorological datasets, including time series, climatic normals, and geospatial data, to derive meaningful agroclimatic indicators.
Explain evaporation, transpiration, and evapotranspiration processes and assess their role within broader soil–plant–atmosphere interactions.
Determine and classify regional climates, utilizing established climate classification systems, Earth's climatic regions, and long-term meteorological datasets.
Describe and assess the climate of Greece, identifying its agroclimatic characteristics, regional variability, and relevance for crop distribution.
Apply methods to predict crop yield using meteorological data, employing empirical, statistical, and model-based approaches.
Develop evidence-based strategies for frost protection and management of weather-related risks, integrating meteorological knowledge with practical decision tools.
Critically evaluate scientific literature in agrometeorology and synthesize complex atmospheric and climatic information into well-reasoned conclusions and recommendations.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Decision making
Autonomous work
Working in an interdisciplinary environment
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Structure and physical properties of the atmosphere. Thermodynamic of the atmosphere. Satellite data. Temperature, wind, hygrometric parameters, solar and terrestrial radiation. Soil temperature. Soil heat flux. Energy balance. Precipitation. Meteorological and climatic stations and instruments. Analysis of meteorological data. Evaporation, transpiration and evapotranspiration. Climate. Climate classification. Earth's climatic regions. The climate of Greece. Microclimate. Climate impact on plants and animals. Climate change and its impact on agriculture. Bioclimatic indices (heat index, drought index). Frost protection. Prediction of crop yield by using

meteorological data.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** elearning.auth.gr : educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.aut.gr and emails,... Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Description of the procedure: Assignment, and final written exams in English. Assessment methods: Written Exam with Multiple Choice Questions (Formative, Summative) Written Assignment (Formative, Summative) **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Formative, Summative) • WrittenAssignment (Formative, Summative)

Activity	Workload/semester
Lectures	65
writingProject	35
BibliographyAnalysis	65
Examinations	3
Total	**168**

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Donald Ahrens, C., & Henson, R. (2015). Meteorology today: An introduction to weather, climate and the environment.
Mölders, N., & Kramm, G. (2014). Lectures in meteorology (Vol. 591). Cham: Springer.

Computer Programming and Optimization Methods

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS302	SEMESTER	3rd Semester
COURSE TITLE	Computer Programming and Optimization Methods		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

to recognize and understand the different types of data and structures of a programming language
to handle and combine the appropriate programming structures and data types.
to design scripts and functions for use on various scientific topics.
to formulate and solve an optimization problem
to understand the optimisation algorithms
to elaborate and apply optimization methods in a programming environment.

General Skills Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Practical application of knowledge Search, analysis and synthesis of data and information, ICT Use Decision making Autonomous work Working in an interdisciplinary environment Promoting free, creative and inductive reasoning	

3. COURSE CONTENT

Introduction to the process of programming. Algorithms, Flowcharts and Pseudocodes. Introduction to the MATLAB programming environment. Data types and operators. Built-in Functions. Vectors, Matrices and Arrays, Input/Output Data files, Branching statements and Loops. M-files (functions, scripts). Results Plotting. Introduction to Optimization Methods. Linear Programming. Metaheuristics and evolutionary algorithms. Application examples.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students **Description** elearning.auth.gr : educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.aut.gr and emails,… Final test grading assisted by electronic means

TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	65
writingProject	35
BibliographyAnalysis	65
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Assignment, and final written exams in English. Assessment methods: Written Exam with Multiple Choice Questions (Formative, Summative) Written Assignment (Formative, Summative) **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Formative, Summative) • WrittenAssignment (Formative, Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Attaway, S. (2018). MATLAB: A practical introduction to programming and problem solving (5th ed.). Butterworth-Heinemann.
Yang, X.-S. (2019). Optimization techniques and applications with MATLAB. Wiley.

Principles of Genetics

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS303	SEMESTER	3rd Semester
COURSE TITLE	Principles of Genetics		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	4	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

- Understand the principles of Genetics in relation to phenomena and manifestations in the life of plants and animals
- Connect theory with practice through experiential participation in laboratory exercises and examples
- Become familiar with solving exercises and designing experiments for understand the heritability of various qualitative and quantitative traits
- Evaluate the genetic value of cultivated plants and farmed animals
- Explain the role of DNA, RNA and proteins for the cell, as well as the central Dogma of Biology
- Integrate genetic diversity based on which genetic improvement schemes may be designed

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Autonomous work
Teamwork
Production of new research ideas

3. COURSE CONTENT

1. Introduction to the Science of Genetics.
2 (two weeks). Genome and cell function.
DNA replication, Transcription & Translation.
Genetic code and gene expression.
3. Phenotype, Genotype, Heredity and Environment.
4 Prokaryotic and Eukaryotic Genome. The genetic material and its regulation in prokaryotic organisms.
Elements of genetics of microorganisms (viruses, bacteria, fungi). The genetic material and its regulation in eukaryotic organisms. Elements of genetics of humans, plants and animals
5. Chromosomal theory of heredity - chromosome composition
Types and morphology of chromosomes - karyotype determination
Cytoplasmic inheritance - mitochondrial and chloroplast DNA
6. The importance of cell divisions (Mitosis & Meiosis) and their biological role.
7. The principles and Laws of Mendelian genetics, gene types, the action of alleles Chromosomal basis of inheritance.
Sex-linked genes and Multiple alleles. Chromosome Mapping and Gene Linkage.
8. Mutations, types and role of genome, chromosome and gene mutations for organisms. Repairing Mechanisms.
Molecular Cytogenetics.
9. Molecular genetics and use of basic molecular markers. The history, application and importance of PCR,Genetic databases
10. Population genetics, Hardy-Weinberg principle, determination of allele and genotype frequencies in a population
11. Introduction to quantitative genetics, interaction of genes with environment, hereditability of complex traits
12. Sustainability and conservation of local genetic resources, local plant varieties, indigenous animal breeds, endangered species

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD	Face to face

Face to face, Distance learning, etc.	
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students **Description** Use of ICT for Teaching, in Laboratory Education and student's projects assignment E- learning.auth.gr: educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.auth.gr and emails Teleconferences Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** • Final written exam – 60% • Project / Laboratory work – 20% • Participation and assignments – 20% **Student Evaluation Languages** English **Student evaluation methods** • EssayDevelopmentQuestions (Summative) • EssayReport (Summative) • WrittenAssignment (Summative)

Activity	Workload/semester
Lectures	39
Laboratory	13
BibliographyAnalysis	77
writingProject	13
StudyCreation	23
Examinations	3
Total	**168**

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

BASIC PRINCIPLES ON GENETIC ANALYSIS- A. GRIFFITHS, S, WESSLER, S. CAROLL, J. DOEBLEY - BROKEN HILL ED. (2019) ISBN 978-9925-563-31-9)

BASIC PRINCIPLES OF GENETICS. KLG, CUMMINGS, SPENCER, PALLADINO - Ακαδημαϊκές Εκδόσεις PEARSON
I - Genetics – A Mendelian approach: Peter J. Russell
SCIENTIFIC JOURNALS
Theoretical & Applied Genetics, Frontiers in Plant Science, Trends in Genetics, PLOS, Human genetics, PUBMED journals

DNA DATA BASIS

Introduction to animal husbandry and farm management

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS304	SEMESTER	3rd Semester
COURSE TITLE	Introduction to animal husbandry and farm management		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, the student will be able to:
Understand the fundamental principles of animal husbandry and the operation of farm animal production systems.
Identify the critical control points within the production cycle and apply them in the management of livestock enterprises.
Assess major farm animal breeds and evaluate their suitability for different husbandry and production systems.
Interpret the structure, objectives, and adaptability of livestock production systems under environmental, climatic, and regulatory changes.
Analyse factors influencing the efficiency and environmental footprint of livestock farms and propose sustainable management practices.

Understand basic economic aspects of farm management and work effectively both individually and in teams within husbandry-related activities.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Respect for the natural environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Introduction to animal husbandry and livestock production systems
Basic concepts of animal growth and productivity
Rational management of livestock enterprises
Critical control points in ruminant farming (cattle – sheep – goats)
Critical control points in monogastric farming (poultry – swine)
Livestock breeds – Ruminants
Livestock breeds – Monogastric
Recording of production traits (milk, eggs, meat)
Livestock farming, environment & environmental footprint
Conservation and management of animal genetic resources
Economic analysis of livestock enterprises
Innovation in livestock farming
Case Study

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face

USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students **Description** Use of ICT: Use of PowerPoint, video projection, educational software, email.
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Student performance is assessed as follows: - Final written examination (70%). - Laboratory exercises and practical activities (20%). - Case study – individual or group assignment (10%). Assessment methods: written exam with multiple choice questions, written exam with short answer questions, laboratory assignment, written assignment (Case Study). **Student Evaluation Languages** English **Student evaluation methods** • ContinuousEvaluation (Summative) • LaboratoryAssignment (Summative) • WrittenAssignment (Summative) • EssayDevelopmentQuestions (Summative)

Activity	Workload/semester
Lectures	39
Laboratory	26
Tutoring	20
StudyVisits	8
BibliographyAnalysis	71
Examinations	4
Total	**168**

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Banerjee, G. C. (2018). A Textbook of Animal Husbandry (8th ed.). Oxford & IBH Publishing. ISBN: 978-81-204-1260-6
Powell, B. (2017). Livestock Production and Management. Larsen & Keller Education. ISBN: 978-1635491661

Food Processing and Preservation Technologies

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS305	**SEMESTER**	3rd Semester
COURSE TITLE	Food Processing and Preservation Technologies		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** Physics, Food Chemistry, General and Food Microbiology, Food Analysis, and Food Engineering **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, students will be able to:
• Identify the main food processing and preservation operations.
• Understand the causes of food spoilage and the methods used for their control or limitation.
• Recognize the impact of processing and preservation operations on the quality and nutritional attributes of food products.
• Understand the dynamic behaviour of food systems and the physicochemical and microbiological changes occurring during processing and preservation.

General Skills Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Adaptation to new situations Decision making Teamwork Working in an interdisciplinary environment Production of new research ideas Respect for the natural environment Promoting free, creative and inductive reasoning	

3. COURSE CONTENT

- Basic principles of food processing
- Thermal processes: pasteurisation, sterilisation, cooking, in-package and out-of-package heat treatment
- Non-thermal (novel) technologies: High Pressure Processing (HPP), Pulsed Electric Fields (PEF), UV radiation, cold plasma
- Chilling – freezing
- Dehydration, drying, concentration
- Fermentation and biopreservation
- Chemical and physical preservation methods
- Packaging systems: Modified Atmosphere Packaging (MAP), active packaging, smart packaging
- Food manufacturing technologies (dairy, beverages, bakery, ready-to-eat foods)

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in teaching, laboratory education, and communication with students elearning.auth.gr: educational material and exercises available to students

	Teaching with electronic presentations (slides, videos, etc.) Laboratory/workshop activities Communication via elearning.auth.gr and email Final examination supported by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	<table><tr><th>Activity</th><th>Workload/semester</th></tr><tr><td>Lectures</td><td>39</td></tr><tr><td>Laboratory</td><td>26</td></tr><tr><td>writingProject</td><td>40</td></tr><tr><td>BibliographyAnalysis</td><td>60</td></tr><tr><td>Examinations</td><td>3</td></tr><tr><td>Total</td><td>168</td></tr></table>
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Methods: Formative • Written examination with multiple-choice questions (Formative, Summative) • Written examination with short-answer questions (Formative, Summative) • Written examination with problem-solving (Formative, Summative) • Written assignment / Presentation The evaluation criteria are listed on the online course page on the e-learning platform. **Student Evaluation Languages** English **Student evaluation methods** • ShortAnswerQuestions (Formative, Summative) • MultipleChoice (Formative, Summative) • ProblemSolving (Formative, Summative) • WrittenAssignment (Formative, Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Principles of Food Processing, Dennis R. Heldman & Richard W. Hartel, Aspen (1997)
Food Processing: Advances in Thermal and Non-Thermal Technologies, CRC Press (2021)
Novel Food Processing Technologies, Gustavo Barbosa-Cánovas, Maria Tapia, Pilar Cano, CRC Press (2004)
Food Processing Technology: Principles and Practice, Fifth Edition, P.J. Fellows. Woodhead Publishing, 2022.

Agricultural Governance: Policy Instruments and Sustainable Cooperative Models

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS306	**SEMESTER**	3rd Semester
COURSE TITLE	Agricultural Governance: Policy Instruments and Sustainable Cooperative Models		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

The learning outcomes of the course, concerning knowledge acquired (K), skills developed (S), and abilities cultivated (A) are summarized below.
After successful completion of the course, students will be able to:
Explain the main policy instruments used in agricultural governance at national, EU, and international levels. (K)
Describe the principles and historical evolution of cooperative and collective action models in agriculture. (K)
Identify sustainability challenges in rural communities and the governance mechanisms designed to address them. (K,S)
Recognize case studies illustrating successful and unsuccessful governance and cooperative practices. (K)
Analyze agricultural policy frameworks and assess their socio-economic and environmental impacts. (S,A)

Compare cooperative models and evaluate their effectiveness in promoting resilience and innovation. (S,A)
Apply theoretical governance concepts to practical scenarios through case study analysis. (S)
Design policy recommendations and cooperative structures aligned with sustainability and EU priorities. (S,A)
Critically evaluate governance instruments and cooperative strategies in diverse agricultural contexts. (A)
Integrate interdisciplinary perspectives (policy, economics, environment, social sciences) into agricultural governance solutions. (A)
Communicate policy analyses and cooperative design proposals effectively in academic and professional settings. (A)
Demonstrate capacity for collaborative problem-solving and participatory decision-making in group projects (A,S)

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Working in an interdisciplinary environment
Production of new research ideas
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

The course Agricultural Governance: Policy Instruments and Sustainable Cooperative Models explores how governance in the agricultural sector is shaped and implemented, with a focus on the policy instruments used by states and international organizations to regulate, support, and promote sustainable agricultural production. It also examines modern cooperative and collaborative models, investigating how collective action and participatory management can enhance resilience, innovation, and socio-economic cohesion in rural communities. Combining theoretical perspectives with practical examples and case studies, the course equips students to assess and design effective policies and sustainable cooperative structures.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education **Description** Use of ICT in Course Teaching (digital presentations, audiovisual material) Use of ICT in Laboratory Teaching (digital presentations, audiovisual material, web searching) Use of ICT in Communication with Students Use of ICT in Student Assessment

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Seminars	26
BibliographyAnalysis	30
StudyCreation	34
writingProject	36
Examinations	3
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

Written Exam with Multiple Choice Questions (Formative, Summative) Written Exam with Short Answer Questions (Formative, Summative) Written Exam with Extended Answer Questions (Formative, Summative) Written Assignment (Formative, Summative) Oral Exams (Formative, Summative) Performance / Staging (Formative, Summative) Written Exam with Problem Solving (Formative, Summative)

Student Evaluation Languages

English

Student evaluation methods

- EssayDevelopmentQuestions (Summative)
- WrittenAssignment (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

European Agricultural Policy, Springer Nature Switzerland, January 2025, DOI 10.1007/978-3-031-83313-7/ ISBNs 978-3-03-183312-0, 978-3-03-183313-7, Editors Franco Sotte, Gianluca Brunori

OECD (2024), Agricultural Policy Monitoring and Evaluation 2024: Innovation for Sustainable Productivity Growth, OECD Publishing, Paris, https://doi.org/10.1787/74da57ed-en.

Dijk van G., Sergaki, P. and Baourakis, G. (2019), «Cooperative Entrepreneurship: Governance and Developments», Cooperative Management Series, Springer

4th Semester

Food analysis

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS401	SEMESTER	4th Semester
COURSE TITLE	Food analysis		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** General Chemistry and Food Chemistry **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, students will have acquired:
Knowledge:
Understanding of analytical methods for evaluating the chemical composition, nutritional value, quality, and authenticity of foods, including major and minor constituents.
Comprehension of chemical, biochemical, and physicochemical indicators, organoleptic evaluation, and relevant food legislation and

standards.
Introductory knowledge of advanced -omics approaches (metabolomics, proteomics, lipidomics) for comprehensive food characterization.
Skills:
Operation of laboratory instruments and analytical devices used in food examination.
Application of specific analytical methods to determine chemical composition (major/minor components and constituents of concern).
Processing, interpretation, and reporting of analytical results using statistical, calibration, and data-processing tools.
Preparation of scientific reports and oral presentation of analytical work.
Independent and collaborative work.
Retrieval, analysis, and synthesis of information from bibliographic and electronic sources to solve practical problems related to food composition, quality and authenticity.
Abilities:
Evidence-based decision-making regarding food quality, safety, and authenticity.
Critical evaluation of analytical results and self-reflection.
Adaptation to new analytical challenges, technologies, and evolving food matrices.
Ethical, social, and environmental responsibility in professional practice.
Promotion of independent, creative, and inductive thinking in problem-solving and scientific inquiry.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Equity and Inclusion
Respect for the natural environment
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

This course offers an engaging and comprehensive exploration of modern food analysis, focusing on understanding and evaluating the chemical composition of foods and beverages. Students will gain hands-on experience in applying analytical techniques—including chemical, biochemical, physicochemical, and physical methods—to measure nutrients, bioactive compounds, and compounds of concern. Advanced -omics approaches, such as metabolomics, proteomics, and lipidomics, will be introduced to provide a deeper

molecular-level understanding of food matrices.
Through practical laboratory exercises, students will analyze real food and beverage samples, investigating nutritional value, quality, authenticity and the presence of components of concern (contaminants, residues, allergens, and additives). Organoleptic assessment is combined with instrumental methods to provide a holistic view of food characteristics. The course also familiarizes students with relevant food legislation and standards, enabling them to evaluate whether products meet quality and authenticity regulations. Students will develop essential professional skills, including data interpretation, critical thinking, problem-solving, and scientific communication, through report writing and oral presentations. By bridging theory with practice and introducing classical and modern analytical tools, this course prepares students for careers in food science, research, quality assurance, and the food industry, while fostering creativity, innovation, and a proactive approach to food challenges.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** elearning.auth.gr: educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.auth.gr and emails, Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in	**Description** Assessment Language: English Assessment Methods: Laboratory performance and laboratory reports – 50% Method type: Laboratory report / practical performance Final written examination – 40% Method type: Multiple Choice, Short Answer, Problem Solving, Essay/Development questions Data interpretation mini-project – 10% Method type: Written assignment / short report (with brief presentation

Activity	Workload/semester
Lectures	26
Laboratory	39
Other	30
writingProject	28
BibliographyAnalysis	42
Examinations	3
Total	**168**

audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	where applicable) Student Information: Assessment criteria and instructions are communicated via: course webpage written guidelines and rubrics e-learning platform announcements **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Summative) • ShortAnswerQuestions (Summative) • WrittenAssignment (Summative) • EssayReport (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Nollet, Toldra Handbook of Food Analysis (2.Vol) 3rd Ed./2015 (CRC press) Montet, Ray, Food traceability and authenticity: Analytical techniques/2017 (CRC Press), AOAC Official Methods of Analysis 22nd Ed./2023 (AOAC International)
Nielsen, Food Analysis 5th ed./2017 (Springer), Nielsen, Handbook of Food Analysis Laboratory Manual 3rd ed./2017 (Springer), Wrolstad, Handbook of Food Analytical Chemistry/2004 (Wiley), Georgiou, Food authentication/2017 (Wiley), Cifuentes, FoodOmics/ 2013 (Wiley)

Soil Science

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS402	SEMESTER	4th Semester
COURSE TITLE	Soil Science		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon completion of this course, students will be able to: 1. Understand the role of soil properties on the growing of agronomic plants. 2. Recognize and understand the effect of different properties of soils on growth of plants

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Respect for the natural environment
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

1. General principles of soil genesis and classification.
2. Soil structure and particle size distribution.
3. Soil Organic matter.
4. Soil chemical and biochemical properties
5. Clay minerals and ion exchange
6. Soil microorganisms, soil fauna.
7. Acid, saline and alkali (sodic) soils
8. Soil physical properties (soil aggregation, aeration and temperature)
9. Soil water (and irrigation water, water movement in soil)
10. Soil taxonomy
11. Soil fertility
12. Plant-soil interaction
13. Improvement of soil properties through management practices.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face

USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)

Use of ICT in Teaching, in Laboratory Education, in Communication with students

USE OF ICT

- Use of ICT in Teaching
- Use of ICT in Laboratory Education
- Use of ICT in Communication with students
- Use of ICT in Evaluation of students

Description

Use of ICT in Course Teaching
Use of ICT in Laboratory Teaching
Use of ICT in Communication with Students
Use of ICT in Student Assessment

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	83
writingProject	18
Examinations	2
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

Compulsory attendance of the laboratory classes. Written exams. 90% Written Exams, 10% Laboratory Report Μέθοδοι Αξιολόγησης: Written Exam with Multiple Choice Questions (Formative, Summative) Written Exam with Short Answer Questions (Formative, Summative) Written Exam with Extended Answer Questions (Formative, Summative) Written Assignment (Formative, Summative) Written Exam with Problem Solving (Formative, Summative) Labortatory Assignment (Formative, Summative)

Student Evaluation Languages

English

Student evaluation methods

- MultipleChoice (Formative, Summative)
- ShortAnswerQuestions (Formative, Summative)
- EssayDevelopmentQuestions (Formative, Summative)
- ProblemSolving (Formative, Summative)
- LaboratoryAssignment (Formative, Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

-

Additional bibliography for study

Σινάνης Κ., Κεραμίδας Β. 2005. Σημειώσεις Εδαφολογίας. ΑΠΘ, Θεσσαλονίκη.
Εργαστηριακές ασκήσεις του μαθήματος Εδαφολογία. 2020. ΑΠΘ, Θεσσαλονίκη.
Brady N.C., Weil R.R. 2011. Εδαφολογία. Εκδόσεις Έμβρυο, Αθήνα (κωδικός Εύδοξος: 12536597).
Παναγιωτόπουλος Κ. 2016. Εδαφολογία. Εκδόσεις Γαρταγάνης, Θεσσαλονίκη (κωδικός Εύδοξος:68397326).

General and Food Microbiology

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS403	SEMESTER	4th Semester
COURSE TITLE	General and Food Microbiology		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, students will be able to describe the structure, function, and diversity of microbial cells—including bacteria, yeasts, molds, protozoa and viruses—explain basic microbial genetics, replication, and gene expression, and identify major spoilage, pathogenic, and beneficial microorganisms relevant to food and agriculture. They will understand intrinsic and extrinsic factors that influence microbial growth in foods and explain fundamental concepts in food microbiology and food–microbe interactions. In terms of skills, students will be able to perform basic microbiological laboratory techniques safely and accurately, apply classical methods for enumeration, isolation, culturing, and identification of microorganisms, and interpret microbial growth curves as well as basic enumeration calculations. Finally, they will develop the competence to communicate microbiological findings using appropriate scientific language and collaborate effectively in a laboratory environment while following good microbiological practice

and biosafety principles.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Decision making
Working in an interdisciplinary environment
Production of new research ideas
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

This course introduces students to the fundamental principles of microbiology with a focus on microorganisms relevant to agriculture and food systems. It covers microbial cell biology, genetics, diversity, growth, metabolism, ecological roles, and interactions with food environments. Students will explore spoilage, pathogenic, and beneficial microorganisms, and gain foundational skills in microbial enumeration, detection, and laboratory safety.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Teaching: electronic presentations (slides, video, etc.), Educational material: available on e-learning Communication: via e-learning/email
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation,	

Activity	Workload/semester
Lectures	39
Laboratory	26

project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	<table><tr><th>Activity</th><th>Workload/semester</th></tr><tr><td>StudyCreation</td><td>26</td></tr><tr><td>BibliographyAnalysis</td><td>77</td></tr><tr><td>Total</td><td>168</td></tr></table>
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Student Assessment methods Written Multiple Choice Test (Formative, Summative) Written Assignment Presentation in audience **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Formative, Summative) • WrittenAssignment (Formative, Summative) • PublicPresentation (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Brock Biology of Microorganisms, Global Edition 16th Edition
Food Microbiology (Adams & Moss)
Prescott's Microbiology

Plant Physiology

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS404	SEMESTER	4th Semester
COURSE TITLE	Plant Physiology		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon completion of this course, students will be able:
1. To understand key concepts involved in crucial plant processes.
2. To comprehend the relationship between plant morphology and plant function.
3. To describe the effects of environmental factors on photosynthesis and the production of biomass.
4. To acquire the background necessary for the study of the physiological functions of plants within cultivation systems in the later stages of their studies.
5.To practice on basic physiological measurements.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Decision making
Autonomous work
Teamwork
Respect for the natural environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

1. Introduction to plant physiology: Phylogenetics, plant classification.
2. Principles of cell physiology, totipotency and applications, homeostatic mechanisms.
3. Photosynthesis: The light reactions, the role of pigments.
4. Carbon reactions in photosynthesis. Photorespiration. C3, C4, CAM and intermediate photosynthetic cycles (alternative pathways).
5. Ecological aspects of photosynthesis
6. Respiration
7. Nitrogen: Metabolism and nitrogen fixation
8. Ionic relationships: Mineral nutrition.
9. Water relations: Water potentials, pathways and mechanisms of water movement.
10. Signals and signal transduction
11. Signal of sunlight , photoreceptors, Tropisms, periodisms, uptake and signal transduction, physiology of senescence.
12. Plant development: Plant hormones. Biomolecules with hormonal activity.
13. Secondary metabolites: Introductory concepts, role and metabolism.

Lab sessions

1. Estimating chlorophyll: Chlorophyll content measurement in situ using a portable chlorophyll-meter. Spectrophotometric determination of leaf chlorophyll a and b.
2.Photosynthesis I: Leaf fluoresence measurements for determining leaf quantum yield (natural conditions and in dark). Fluorescence induction curves.
3.Photosynthesis II: Carbon assimilation. Leaf carbon exchange measurements for determining net photosynthesis.
4.Water relations. Transpiration measurements through stomatal conductance monitoring.
5.Determination of leaf area index of the whole foliage in situ and of individual leaves in the laboratory-plant productivity determination.

4. LEARNING & TEACHING METHODS - EVALUATION

<table>
<tr><td>TEACHING METHOD
Face to face, Distance learning, etc.</td><td>Face to face</td></tr>
<tr><td>USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)
Use of ICT in Teaching, in Laboratory Education, in Communication with students</td><td>USE OF ICT
• Use of ICT in Teaching
• Use of ICT in Laboratory Education
• Use of ICT in Communication with students
• Use of ICT in Evaluation of students
Description
Use of ICT in Course Teaching
Use of ICT in Laboratory Teaching
Use of ICT in Communication with Students
Use of ICT in Student Assessment</td></tr>
<tr><td>TEACHING ORGANIZATION
The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards</td><td><table><tr><th>Activity</th><th>Workload/semester</th></tr><tr><td>Lectures</td><td>39</td></tr><tr><td>Laboratory</td><td>26</td></tr><tr><td>StudyCreation</td><td>55</td></tr><tr><td>Tutoring</td><td>22</td></tr><tr><td>writingProject</td><td>23</td></tr><tr><td>Examinations</td><td>3</td></tr><tr><td>Total</td><td>168</td></tr></table></td></tr>
<tr><td>STUDENT EVALUATION
Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed</td><td>Description
Written Exam with Multiple Choice Questions (Summative) Written Exam with Short Answer Questions (Formative, Summative) Written Exam with Problem Solving (Formative, Summative)

Student Evaluation Languages
English

Student evaluation methods
• MultipleChoice (Summative)
• ShortAnswerQuestions (Formative, Summative)
• ProblemSolving
(Formative, Summative)</td></tr>
</table>

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

EUDOXUS Lincoln Taiz, Eduardo Zeiger, Ian Max Moller, Angus Murphy (2014) Plant Physiology and Development 6th edition, Sinauer Associates, Inc Publishers Sunderland, Massachusetts U.S.A.
Hopkins WG., Huner NPA, 2008. Introduction to Plant Physiology , 4th edition John Wiley & Sons, Inc, Hoboken.

Biochemistry

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS405	SEMESTER	4th Semester
COURSE TITLE	Biochemistry		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

1. Biochemical terminology.
2. Basic knowledge about the life on the earth at molecular level (structure of macromolecules and their building blocks, their biological roles, as well an introductory aspect about their metabolism).
3. Scientific apprehension, understanding better and going deeper about the management of biological systems at the field (farming).

General Skills Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Practical application of knowledge Decision making Teamwork Working in an interdisciplinary environment Production of new research ideas Promoting free, creative and inductive reasoning	

3. COURSE CONTENT

The life on the earth. The aminoacids, the polypeptide chain and the proteins. The biological role of the proteins: the enzymes, role of the cofactors and the essential inorganic elements and the chromoproteins. Practical uses of enzymes's inhibitors. Nitrogen cycle and the aminoacids synthesis. Aminoacids precursors of other biomolecules of practical issue. RNA metabolism and the synthesis of the proteins: transcription, translation and their control. DNA metabolism: the replication. Overview on the energy metabolism: respiration and photosynthetic events of the photosynthesis (cycle of Krebs, oxidative phosphorylation, photophosporylation). Energy metabolism of bacteria. Oxygen metabolism and the antioxidative substances. The carbohydrates: degradation under aerobic and anaerobic conditions. The synthesis of the carbohydrates by photosynthetic organisms. Structural lipids, the membranes and their role, lipid superoxidation. Lipids metabolism: biosynthesis and degradation of fatty acids.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching Use of ICT in Communication with Students Use of ICT in Student Assessment elearning.auth.gr: educational materials available to students along with exercises

TEACHING ORGANIZATION
The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Seminars	26
StudyCreation	65
writingProject	35
Examinations	3
Total	**168**

STUDENT EVALUATION
Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description
Written Exam with Multiple Choice Questions (Summative) Written Exam with Short Answer Questions (Formative, Summative) Written Exam with Problem Solving (Formative, Summative)

Student Evaluation Languages
English

Student evaluation methods

- MultipleChoice ()
- ShortAnswerQuestions ()
- ProblemSolving ()

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Lehninger Principles of Biochemistry, Nelson DL, Cox MM. 8th Edition
Biochemistry, Berg JM, Tymoszko JL, Gatto GJ, Stryer L. 9th Edition

Entrepreneurship and Social Innovation in the Agrifood Sector

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS406	SEMESTER	4th Semester
COURSE TITLE	Entrepreneurship and Social Innovation in the Agrifood Sector		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

The learning outcomes of the course, concerning knowledge acquired (K), skills developed (S), and abilities cultivated (A) are summarized below.
After successful completion of the course, students will be able to:
Explain the core mechanisms of rural entrepreneurship and social innovation within agrifood schemes, rural communities, and sociotechnical systems (K).
Identify and evaluate opportunities for social-impact ventures, considering community needs, sustainability challenges, policy drivers, and market dynamics (K, S).
Apply principles of organizational and community-led innovation to support inclusive rural development and socially-oriented agrifood

entrepreneurship (K, S).
Conduct analytical assessments of agrifood systems, integrating economic, environmental, and social-impact criteria with attention to equity and resilience (K, S).
Analyze social-innovation pathways and assess feasibility, social value creation, and system-level impacts (K, S).
Design socially innovative business models (e.g restructured agricultural cooperatives that leverage digital tools, participatory practices, and sustainability-oriented innovation (S).
Develop and evaluate business plans for rural enterprises, with explicit consideration of social missions (S).
Develop and test value propositions addressing social and environmental needs, using structured methodologies such as hypothesis testing, community feedback, and impact validation (S, A).
Make informed decisions under uncertainty, using evidence, participatory scenario analysis, risk-evaluation techniques (A).
Collaborate effectively in interdisciplinary teams, integrating entrepreneurial, scientific, and social-innovation perspectives (A).

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Decision making
Autonomous work
Teamwork
Project design and management
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

The course “Entrepreneurship and Social Innovation in the Agrifood Sector” examines how socially-oriented entrepreneurial mechanisms and innovation processes transform agrifood systems in response to sustainability imperatives, community needs, and socio-environmental challenges. It fosters an entrepreneurial mindset, enabling students to assess opportunities that create both economic and social value and to design solutions that promote inclusion, resilience, and sustainable development in the agrifood sector. The course addresses value identification in complex sociotechnical systems, with emphasis on community engagement, participatory innovation, and inclusive governance models. Students learn to develop business models that integrate social innovation principles, digital technologies, and sustainable practices. Particular attention is given to understanding the role of organizational and community-driven innovation in advancing rural and regional development. It further examines the transition from socially-oriented concepts to viable social-impact ventures, emphasizing hypothesis testing, stakeholder and community feedback, impact validation, and the alignment of social missions with market conditions and sustainability objectives. The course focuses on strategies for evaluating social-innovation pathways, designing impactful products and services, and adapting entrepreneurial solutions to environments characterized by economic, environmental, and social interdependencies. Through these components, the course strengthens decision-making under uncertainty, deepens understanding of rural innovation ecosystems, and equips attendees with

skills that support the emergence of inclusive, economically viable, resilient, and socially sustainable agrifood enterprises and cooperatives.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching (digital presentations, audiovisual material) Use of ICT in Laboratory Teaching (digital presentations, audiovisual material, web searching) Use of ICT in Communication with Students Use of ICT in Student Assessment
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	39
Seminars	26
BibliographyAnalysis	30
StudyCreation	24
writingProject	26
Other	20
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Written Exam with Multiple Choice Questions (Formative, Summative) Written Exam with Short Answer Questions (Formative, Summative) Written Exam with Extended Answer Questions (Formative, Summative) Written Assignment (Formative, Summative) Oral Exams (Formative, Summative) Performance / Staging (Formative, Summative) Written Exam with Problem Solving (Formative, Summative) **Student Evaluation Languages** English **Student evaluation methods**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	• MultipleChoice (Formative, Summative) • ShortAnswerQuestions (Formative, Summative) • EssayDevelopmentQuestions (Formative, Summative) • WrittenAssignment (Formative, Summative) • OralExam (Formative, Summative) • ContinuousEvaluation (Formative, Summative) • ProblemSolving (Formative, Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

-

Additional bibliography for study

OECD. (2022). Unlocking Rural Innovation. OECD Rural Studies, OECD Publishing, Paris, https://doi.org/10.1787/9044a961-en
OECD. (2024). Assessing the Framework Conditions for Social Innovation in Rural Areas. OECD Local Economic and Employment Development (LEED) Papers, No. 2024/04, OECD Publishing, Paris, https://doi.org/10.1787/74367d76-en
Dijk van G., Sergaki, P. and Baourakis, G. (2019), «Cooperative Entrepreneurship: Governance and Developments», Cooperative Management Series, Springer
Drucker, P.F. (1984). Innovation and Entrepreneurship: Practice and Principles. HarperCollins e-books.

5th Semester

Digital Systems in Agriculture

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS501	SEMESTER	5th Semester
COURSE TITLE	Digital Systems in Agriculture		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Skill Development
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Students will become familiar with digital systems that support both their educational and agricultural practice needs. They will learn relevant terminology and the role of sensors, actuators, IoT systems, GNSS and control/automation in modern agricultural machinery and smart applications. They will be introduced to different types of agricultural and environmental data, acquired by heterogeneous sensors, as well as the content and contribution of agricultural big data, AI analytics and data processing. Students will learn to formalize agricultural processes and challenges by expressing them through algorithmic structures, logical reasoning, and

computational and to evaluate digital solutions based on IoT platforms and smart applications in agricultural domain. They will learn to handle reliable and current agricultural and market information using online resources and specialized agricultural databases. They will also gain an introductory understanding of emerging digital technologies in agriculture, such as blockchain-based traceability systems, digital twins, and basic principles of cybersecurity relevant to agricultural application. Students will be able to capitalize digital records and information flow in farm management systems, post-harvest operations, and digitally controlled environments in agricultural domain. They will also learn to create new digital tools and to evaluate the contribution of those emerging technologies to the evolvement of agriculture. Finally, students are expected to competently utilize and critically appraise emerging digital technologies during their studies and in their professional practice within the agri-food sector.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Adaptation to new situations
Decision making
Teamwork
Working in an interdisciplinary environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Module 1 – Foundations of Digital Agriculture
Introduction to Digital Systems in Agriculture
Digital workflows and system architectures
Data standards and interoperability
Module 2 – Sensors, IoT and Data Acquisition
Module 3 – Robotics, Machinery and Automation
• Aerial and ground robotic platforms
• Digital Systems in Agricultural Machinery
– Electronic Control Units (ECUs), CAN-bus, ISOBUS
– Sensor integration, telemetry, and machine data streams
– Automation and guidance systems (GNSS/RTK auto-steer)
– Variable-rate technologies and smart implements
– Telematics, remote diagnostics, and predictive maintenance
Automation and control systems
Digital Controlled Environment Agriculture (CEA)
– Environmental monitoring
– (Micro-/) Climate regulation and automated control loops (temperature, humidity, CO_2, irrigation, lighting)
Module 4 – Data Analysis and Intelligent Systems

Aerial and Ground Robotic Technologies in Agriculture
Introduction to Big Data and agricultural datasets
Machine Learning and AI tools in agricultural applications
Digital twins for simulation and predictive modeling
High-Performance Computing (HPC) for large-scale models, simulations and AI training
Module 5 – Platforms, Software & Decision Support
Blockchain and Traceability
Digital systems in post-harvest management
Cybersecurity risks and best practices in agri-data management
Module 6 – Technology Adoption and Impact
• Key factors influencing the adoption and practical use of digital tools in agriculture
• Small-scale applications and usability, reliability, and maintainability in real field conditions
• Practical implications of digital tool deployment for farmers, operators, and agricultural consultants

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching Use of ICT in Laboratory Teaching Use of ICT in Communication with Students Use of ICT in Student Assessment elearning.auth.gr : educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.auth.gr and emails,… Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	39
Laboratory	26
Seminars	4
writingProject	52
BibliographyAnalysis	44
Examinations	3

Activity	Workload/semester
Total	**168**

STUDENT EVALUATION	
Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Written Exam with Multiple Choice Questions Written Exam with Short Answer Questions Written Exam with Extended Answer Questions Written Assignment Report **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Summative) • ShortAnswerQuestions (Summative) • EssayDevelopmentQuestions (Summative) • WrittenAssignment (Summative) • EssayReport (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

-

Additional bibliography for study

Digital Agriculture. Queiroz et al., Springer (2022). https://link.springer.com/book/10.1007/978-3-031-14533-9
Handbook Digital Farming: Digital Transformation for Sustainable Agriculture. Dörr, J., & Nachtmann, M., Springer (2022). https://link.springer.com/book/10.1007/978-3-662-64378-5
X.E. Pantazi, D.Moshou, D. Bochtis (2019). Intelligent Data Mining and Fusion Systems in Agriculture, 1st Edition, Academic Press, ISBN: 9780128143919. (https://www.elsevier.com/books/intelligent-data-mining-and-fusion-systems-in- agriculture/pantazi/978-0-12-814391-9)

Food Biotechnology

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS502	SEMESTER	5th Semester
COURSE TITLE	Food Biotechnology		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** General and Food Microbiology, Food Chemistry **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, students will have acquired:
Knowledge:
Explain the principles, methodologies, and technologies that utilize microorganisms or plant/animal cells for the industrial production of fermented foods and food-related bio-based products, including single-cell protein, mycoprotein, enzymes, microbial polysaccharides, organic acids, vitamins, pigments, and microbial lipids.
Characterize the different cell types employed in biotechnology (microbial, plant, and animal) and describe their metabolic pathways, physiological requirements, and nutritional profiles relevant to industrial applications and fermentation processes.
Describe fermentation strategies, bioreactor configurations, and kinetic models applicable to large-scale bioprocesses, including those

used for fermented food production.
Demonstrate understanding of enzyme immobilization techniques, biocatalysis principles, and their applications in microbial, enzymatic, and fermented-food bioprocesses.
Discuss the principles and methods for valorizing agro-industrial residues and food-industry wastes through physicochemical and biotechnological processes.
Skills:
Analyze and optimize fermentation and cell-culture processes, identifying key factors influencing microbial growth, productivity, and product quality.
Design and execute experimental protocols for cultivating microorganisms, studying microbial metabolism, and producing, quantifying, and characterizing microbial, enzymatic, and fermentation-derived products.
Apply biotechnological principles to innovative food applications, including fermented foods, enzyme-based processes, and tissue-culture–derived foods (e.g., cultivated meat).
Perform basic calculations, kinetic analyses, and data processing to interpret bioprocess performance and assess efficiency.
Conduct statistical analysis and evaluation of experimental data, and prepare clear scientific manuscripts, laboratory reports, and oral presentations.
Collaborate effectively in multidisciplinary environments while also demonstrating initiative and the ability to work independently.
Retrieve, evaluate, and integrate information from bibliographic, scientific, and electronic resources to address practical challenges in food biotechnology and fermentation technology.
Abilities:
Make evidence-based decisions to evaluate precision fermentation outcomes and ensure the quality, safety, and authenticity of fermented foods through the evaluation of microbial activity and fermentation conditions.
Critically evaluate experimental outcomes, reflect on methodological limitations, and propose improvements.
Adapt to new biotechnological challenges, emerging fermentation technologies, and evolving food matrices.
Demonstrate ethical, social, and environmental responsibility when addressing issues related to microbial processes, bioprocessing, and waste management.
Promote independent, creative, and inductive thinking in scientific inquiry, problem-solving, and the development of novel biotechnological food products

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Equity and Inclusion
Respect for the natural environment

Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

This course offers a clear and accessible introduction to modern food biotechnology, with a primary emphasis on the use of microorganisms and, to a lesser extent, plant and animal cells for producing foods and food-related biotechnological products. Students will explore the selection, preservation, and genetic improvement of microorganisms; the cultivation of plant and animal cells; and key fermentation strategies used in food and industrial bioprocesses. The course also covers the design, operation, and control of various bioreactor systems.

Through integrated theoretical instruction and hands-on laboratory activities, students will gain familiarity with essential biotechnological tools and laboratory techniques relevant to microbial and enzymatic processes. Modern analytical approaches for cultivating, monitoring, and characterizing microbial cultures are introduced, enabling students to assess growth, metabolism, and product formation.

A strong emphasis is placed on the industrial potential of microorganisms to produce valuable bio-based products, including fermented foods, single-cell protein, mycoprotein, organic acids, polysaccharides, pigments, vitamins, microbial lipids, and other fermentation-derived compounds. Special focus is given to precision fermentation as an emerging platform for targeted, high-efficiency production of functional food components, as well as to the roles of microorganisms—such as starter cultures, probiotics- and postbiotics in developing health-promoting fermented foods.

The course also examines how agro-industrial residues and food-industry wastes can be treated, managed, and valorized through biotechnological and physicochemical processes, highlighting sustainability and circular bioeconomy principles.

By integrating scientific concepts with practical applications, the course equips students with the ability to apply cell-based technologies, analyze bioprocess data, and understand the opportunities and challenges associated with industrial production of biotechnological products. Overall, it provides a strong foundation for advanced study and careers in food biotechnology, fermentation industries, and food-related bioprocess design.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** elearning.auth.gr: educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.auth.gr and emails, Final test grading assisted by electronic means

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Laboratory	26
Internship	20
Other	25
StudyVisits	8
writingProject	47
Examinations	3
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

Assessment Language: English Assessment Methods: Laboratory performance and laboratory reports – 30% Method type: Laboratory report / practical performance Final written examination – 60% Method type: Multiple Choice, Short Answer, Problem Solving, Essay/Development questions Data interpretation mini-project – 10% Method type: Written assignment / short report (with brief presentation where applicable) Student Information: Assessment criteria and instructions are communicated via: course webpage written guidelines and rubrics e-learning platform announcements

Student Evaluation Languages

English

Student evaluation methods

- LaboratoryAssignment (Summative)
- EssayDevelopmentQuestions (Summative)
- WrittenAssignment ()

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

Additional bibliography for study

Stanbury, P.F., Whitaker, A. and Hall, S.J., 2013. Principles of Fermentation Technology. Elsevier.
Johnson-Green, P., 2018. Introduction to Food Biotechnology. CRC press.
Hanson, J.R., 2008. Chemistry of fungi. Royal Society of Chemistry.
Panesar, P.S. and Anal, A.K. eds., 2022. Probiotics, Prebiotics and Synbiotics: Technological Advancements Towards Safety and Industrial Applications. John Wiley & Sons.

Kharwar, R.N., Upadhyay, R.S., Dubey, N.K. and Raghuwanshi, R. eds., 2014. Microbial diversity and biotechnology in food security. Springer.
Kuddus, M. and Kuddus, 2018. Enzymes in Food Technology. Springer Singapore.
Byong H. Lee, 2015. Fundamentals of Food Biotechnology, John Wiley & Sons, Ltd
Ravishankar Rai V, 2016. Advances in Food Biotechnology, John Wiley & Sons Ltd
Zorn, H. and Czermak, P., 2014. Biotechnology of food and feed additives. Springer.
Stahl, U., 2008. Food biotechnology. Springer-Verlag Berlin Heidelberg.
Charles W. Bamforth, David J. Cook, 2019. Food, Fermentation, and Micro-organisms. John Wiley & Sons Ltd.,

Plant Pathology

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS503	SEMESTER	5th Semester
COURSE TITLE	Plant Pathology		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** It is recommended to have basic background on Plant Physiology and Biochemistry to follow the class more efficiently **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course the students will be able to:

Name, classify and describe the causes of plant diseases
Describe the transmission manner and the epidemiology of pathogens inducing diseases in plants
Apply the methods used for diagnosis of the diseases and detection of the related pathogens
4. Describe the measures proposed for the control of plant diseases

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Respect for the natural environment

3. COURSE CONTENT

Module 1: Introduction to Plant Pathology
Description: Concept of the disease, biotic-abiotic causes of plant diseasesl

Module 2: Fungi as Plant Pathogens
Description: Morphology-physiology-replication of fungi, Taxonomy of fungi.

Module 3: Prokaryotes as Plant Pathogens
Description: morphology-replication-taxonomy of prokaryotic plant pathogens

Module 4: Viruses as plant pathogens
Description: Virus morphology-Taxonomy-Diagnosis.

Module 5: Viruses as plant pathogens
Description: Infection of plants and replication/movement of viruses. Virus epidemiology and control.

Module 6: Parasitism and Disease development
Description: Parasitism and pathogenicity, Host range of pathogens, Development of disease in plants

Module 7: Parasitism and Disease development
Description: The disease cycle, relationships between disease cycles and epidemics

Module 8: Pathogenesis Mechanisms.
Description: Mechanical forces, chemical weapons, enzymes, toxins of pathogens.

Module 9: Plant Defense Mechanisms.
Description: Preexisting structural and chemical defenses, induced structural and chemical defenses, signal transduction

Module 10: Plant Disease Epidemiology
Description: The elements of an epidemic, Methods of plant disease measurement, Patterns and development of epidemics

Module 11: Environmental Effects on Plant Disease development
Description: Effect of temperature, moisture, wind, light, soil pH and soil structure

Module 12: Control of Plant Diseases
Description: Sanitary measures, cultural practices, natural methods and other plant disease management practices other than chemical control, Biological control agents, mechanisms of biocontrol, plant defense mechanisms against pathogens (non-host resistance, hypersensitive response, systemic resistance, resistance genes

Module 13: Control of Plant Diseases
Description: History of chemical control, fungicide grouping based on their movement and mode of action, fungicide resistance (selection of resistance, mechanisms of resistance and resistance management), Use of Resistance Inducers in Plant Disease Management

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** elearning.auth.gr : educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.auth.gr and emails Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	72
writingProject	28
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** 80% written exams (multiple choice test, short answer questions, problem solving), 20% written project and presentation in audience **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Summative) • ShortAnswerQuestions (Summative) • WrittenAssignment (Summative) • PublicPresentation (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Agrios G, (2005), Plant Pathology 6th edition, Elsevier Publishing Co Inc.
Gail L. Schumann and Cleora J. D'Arcy, (2009), Essential Plant Pathology, second edition, American Phytopathological Society

Intelligent animal nutrition

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS504	SEMESTER	5th Semester
COURSE TITLE	Intelligent animal nutrition		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, students will be able to:
1. Understand the principles of traditional animal nutrition and the transition to smart, digitally supported nutrition systems.
2. Assess feedstuffs and nutrient value using modern tools, sensors, and feed-analysis software.
3. Design balanced and cost-effective rations using intelligent diet formulation software and data-driven nutritional models.
4. Apply basic concepts of artificial intelligence and smart technologies in livestock nutrition at a practical level.
5. Evaluate real-world examples of intelligent animal nutrition and identify benefits, limitations and applicability.
6. Collaborate in an interdisciplinary environment to develop simple smart-nutrition applications in livestock systems.

General Skills Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

1. Introduction to animal nutrition and the transition to intelligent nutrition systems.
2. Nutrients, metabolism, and nutritional requirements of livestock.
3. Core concepts of smart and digitally supported animal nutrition.
4. Methods of data collection: basic sensors and nutrition-monitoring tools.
5. Intelligent feeding systems: automatic feeders, feed intake monitoring, group management.
6. Feed analysis using modern techniques (NIRS, digital quality-control tools).
7. Use of software for designing balanced and cost-effective rations.
8. Basic principles of artificial intelligence and introductory applications in nutrition.
9. Computer vision and intelligent tools for body condition and health assessment.
10. Plant bioactive compounds and intelligent nutritional strategies.
11. Sustainability, welfare, and emission reduction through intelligent nutrition.
12. Practical applications in cattle, small ruminants, pigs, and poultry.
13. Case study and development of a small, applied project in intelligent animal nutrition.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning

USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Laboratory Education • Use of ICT in Communication with students **Description** Use of ICT in Course Teaching, Laboratory Teaching and Communication with Students
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Assessment includes: • Final written exam (70%) with short-answer questions and applied nutrition problem-solving. • Presentation and submission of a group case-study project (30%). **Student Evaluation Languages** English **Student evaluation methods** • ShortAnswerQuestions (Summative) • ProblemSolving (Summative) • WrittenAssignment (Summative)

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	22
writingProject	40
Other	38
Examinations	3
Total	**168**

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

Additional bibliography for study

- Feed formulation manuals & software documentation
- Lecture notes by instructor
- "Intelligent Animal Nutrition" (forthcoming textbook)
- Scientific journals: Animal Feed Science

Principles of pesticides

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS505	SEMESTER	5th Semester
COURSE TITLE	Principles of pesticides		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course the students will be able to:
1. Propose safe application of plant protection products
2. Distinguish the categories of pesticides based on their mechanisms of action.
3. Analyse the physico-chemical properties of conventional and low-risk pesticides.
4. Discuss issues of pesticide residues, formulation, and safe use.
5. Describe the legislation and pesticide registration, and the inspections of the proper use
6. Discuss the enviromental fate of pesticides

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Adaptation to new situations
Decision making
Respect for the natural environment
Critical thinking

3. COURSE CONTENT

Module 1: History of chemical crop protection and role of pesticides
Description: Pesticide evolution, pesticides and integrated pest management principles

Module 2: Pesticides and Formulation Technology
Description: Formulation of plant protection products, determination of physicochemical properties, stability of pesticide formulation

Module 3: Label interpretation
Description: Legal use of pesticides, professional use, content of the label, digital label requirements

Module 4: Legislation and regulations
Description: Pesticide registration in EU and Greece, the role of evaluation bodies, data requirements

Module 5: Ecotoxicology and human health
Description: Hazard/risk to humans, wildlife, and the environment

Module 6: Environmental fate of pesticides
Description: Adsorption, degradation, leaching, volatilization, run-off, spray-drift, groundwater contamination

Module 7: Low-Risk Pesticides and European Regulation
Description: Categories of low-risk pesticides, particularities of low-risk pesticides, new approach methods in pesticide risk assessment, pesticide registration in EU, problem formulation and qualitative risk assessment

Module 8: Pesticide Residues and Remediation Techniques
Description: Pesticide residues in food and feed, environmental fate of pesticides, diffused and point-source pollution, bioremediation and phytoremediation technologies, advanced instrumental analytical techniques

Module 9: Pesticide and application technology
Description: Pesticide application equipment and calibration

Module 10: Major chemical classes of insecticides and resistance management
Description: Categories of insecticides, classification, mode of action

Module 11: Major chemical classes of herbicides and resistance management
Description: Categories of herbicides, classification, mode of action

Module 12: Major chemical classes of fungicides and resistance management
Description: Categories of fungicides, classification, mode of action

Module 13: Sampling and instrumental analysis of pesticides
Description: Sampling protocols, extraction techniques, clean-up, chromatographic analytical equipment

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Teaching and Lab Software: Teaching with electronic presentations (slides, video, etc.) and e-learning platform (elearning.auth.gr : educational materials available to students along with exercises), communication via elearning.aut.gr and emails, final test grading assisted by electronic means.
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a	**Description** 80% written exams (multiple choice test, short answer questions, problem solving), 20% written project and presentation in audience **Student Evaluation Languages** English **Student evaluation methods**

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	75
StudyCreation	25
Examinations	3
Total	**168**

patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	• MultipleChoice (Summative) • ShortAnswerQuestions (Summative) • ProblemSolving (Summative) • WrittenAssignment (Summative) • PublicPresentation (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Krieger, R. (ed.) (2010) Hayes' Handbook of Pesticide Toxicology. 3rd edn. Academic Press
Parween, T. and Jan, S. (2019) Ecophysiology of Pesticides: Interface between Pesticide Chemistry and Plant Physiology. Academic Press

Agrifood Marketing, Consumer and Sustainability

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS506	SEMESTER	5th Semester
COURSE TITLE	Agrifood Marketing, Consumer and Sustainability		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Students are expected, upon successful completion of the course, to:
understand the role of the agrifood sector on the agricultural and national economy and sustainability, the principles of consumer behaviour and marketing on sustainable markets of agricultural products and the whole agrifood sector.

By the end of the course, students will be able to:
Understand and interpret the structure and functioning of agrifood markets at both local and global levels.
Apply marketing principles (strategic planning, marketing mix, branding) to the agrifood sector.
Analyze consumer behavior and preferences, integrating factors of sustainability, authenticity, and convenience.

Evaluate and design sustainable marketing strategies that incorporate ESG dimensions and address environmental and social challenges.
Use modern digital technologies (precision agriculture, blockchain, data analytics) to enhance transparency, traceability, and marketing effectiveness.
Develop business models that balance profitability with sustainability goals and ethical practices.
Critically assess global-local marketing dilemmas and construct international marketing plans for agrifood products.
Communicate marketing and sustainability insights effectively, supporting decision-making in agrifood enterprises and policy contexts.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Autonomous work
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Introduction and analysis of agricultural and food markets and market structures. Strategic marketing, planning, developing marketing strategies, and the marketing mix (product, price, place, promotion). Consumer purchasing behavior and demand, and the role of sustainability, authenticity, and convenience. Sustainability and business models, analysis of the environmental impact of food production, food waste, and ESG (Environmental, Social, and Governance) strategies. Global and local marketing, the local versus global dilemma, and international marketing plans. Branding, decision-making, and strategy, brand repositioning and product positioning. Digital technologies like precision agriculture and blockchain, tools for analysis and innovation.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching Use of ICT in Communication with Students

	elearning.auth.gr : educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) workshops on computer systems, communication via elearning.auth.gr and emails Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Written Exam with Multiple Choice Questions (Formative) Written Exam with Short Answer Questions (Formative) Written Exam with Extended Answer Questions (Formative) Oral Exams (Formative) Written Assignment (Formative, Summative) **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Formative) • ShortAnswerQuestions (Formative) • EssayDevelopmentQuestions (Formative) • OralExam (Formative)

Activity	Workload/semester
Lectures	39
Seminars	26
BibliographyAnalysis	40
StudyCreation	29
Other	31
Examinations	3
Total	**168**

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Meixner, O. Riefler, P. and Schanes, K. (2021) Sustainable Consumer Behavior and Food Marketing, Mdpi AG eds
ISBN: 978-3036525945

6th Semester

Viticulture

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS601	SEMESTER	6th Semester
COURSE TITLE	Viticulture		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** It is recommended to have basic background on Plant physiology **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course the students will be able to:
understand the developmental biology of the vine
understand grape chemical composition, and ripening biochemistry
understand the main principles of ampelography
know the basic grape varieties and rootstocks

learn the fundamental grape cultivation techniques
General Skills Name the desirable general skills upon successful completion of the module Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Search, analysis and synthesis of data and information, ICT Use Production of new research ideas Respect for the natural environment Critical thinking

3. COURSE CONTENT

Introduction, botanical origin, geographical distribution and systematics of the grapevine. Morphology, anatomy, physiological processes and annual cycle. Growth and development of the grape, biosynthesis and evolution of berry metabolites (sugars, organic acids, phenolic compounds, nitrogenous compounds, aroma compounds) during ripening. Harvesting. Ecology of the vine. The notion of terroir. Mass and clonal selection, and breeding. Propagation of the vine. Establishment of a vineyard. Training systems, winter pruning, summer canopy management techniques. Basic principles of grape growing. The genus Vitis. The main varieties and rootstocks. Basic principles of Ampelography.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Teaching and Lab Software: Teaching with electronic presentations (slides, video, etc.) and e-learning platform (elearning.auth.gr : educational materials available to students along with exercises), communication via elearning.aut.gr and emails, final test grading assisted by electronic means

TEACHING ORGANIZATION
The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
FieldExercise	26
BibliographyAnalysis	35
writingProject	65
Examinations	3
Total	**168**

STUDENT EVALUATION
Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description
Assessment Language: English, 80% written exams (multiple choice test, short answer questions, problem solving), 20% Field Report

Student Evaluation Languages
English

Student evaluation methods

- MultipleChoice (Summative)
- ShortAnswerQuestions (Summative)
- LaboratoryReport (Summative)
- FieldReport (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Markus Keller (2020) The Science of Grapevines Third Edition. ISBN 978-0-12-816365-8, DOI https://doi.org/10.1016/C2017-0-04744-4, Academic Press, 541 p.

Principles of modern fruit science

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS602	SEMESTER	6th Semester
COURSE TITLE	Principles of modern fruit science		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, students will:
1. identify the various fruit trees
2. understand the basic physiological functions of fruit trees
3. understand the basic cultivation techniques of fruit trees
4. Apply horticultural practices such as pruning, training, irrigation, fertilization
5. Compare and select suitable cultivars and rootstocks
6. Demonstrate proper orchard establishment procedures
7. Assess postharvest handling practices that affect fruit quality

8. Discuss sustainability considerations in fruit production and ecological impacts.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Respect for the natural environment

3. COURSE CONTENT

Module 1: Introduction in Pomology
Description: Recent developments in Pomology, production in Mediterranean area, parts of a fruit tree, terminology regarding flowering, fruit set etc.

Module 2: The types of fruit trees
Description: Pomological classification of fruit trees, evergreen and deciduous fruit trees, most cultivated species in Mediterranean area.

Module 3: The influence of climatic factors on the physiology of fruit trees
Description: Climatic factors that affect the aboveground and underground parts of the tree, extreme weather events and impact on orchards, dormancy.

Module 4: Frost and fruit tree physiology
Description: Types of frost, critical developmental stages of tree in frost, frost protection in an orchard.

Module 5: Rootstock of fruit trees
Description: Description, use and characteristic of rootstocks, rootstock-cultivar relation, the used rootstock in fruit trees.

Module 6: Propagation in fruit trees
Description: Sexual, asexual or vegetative propagation, seeds, grafting, cuttings, air layering, propagation methods, in vitro propagation.

Module 7: Orchard establishment and pruning of fruit trees
Description: Preparation of field, planting strategy, fruit tree training system, mechanization of production, principles of pruning,

optimum pruning depending on tree age.

Module 8: Fertilization management in fruit trees
Description: Inorganic and organic fertilizers, type of fertilizers, application methods, monitoring of fertilization, hydrofertilization, soil and leaf test.

Module 9: Irrigation and orchard soil treatment
Description: Water-use efficiency in orchard, irrigation methods in orchard, weed management in an orchard.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching, in Laboratory Education, in Communication with students. Teaching with electronic presentations (slides, video, etc.) and e-learning platform (elearning.auth.gr: educational materials available to students), communication via elearning.aut.gr and emails, final test grading assisted by electronic means.
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	39
Laboratory	26
writingProject	35
StudyCreation	65
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others	**Description** English, 70% written exams (multiple choice test, short answer questions), 10% written report of field and laboratory exercise, 20% written assignment with presentation **Student Evaluation Languages** English **Student evaluation methods**

Please indicate all relevant information about the course assessment and how students are informed	• MultipleChoice (Formative) • ShortAnswerQuestions (Formative) • LaboratoryReport (Formative) • FieldReport (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Sansavini, S., Costa, G., Gucci, R., Inglese, P., Ramina, A., Xiloyannis, C., and Desjardins,Y., eds. (2019). Principles of Modern Fruit Science (Leuven, Belgium: ISHS), pp.421. ISBN 978-94-6261-204-4
Edgar Crombie (2016). Textbook of Pomology, pp. 217. ISBN 13: 978-16-8286-136-3.

New trends in Floriculture

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS603	SEMESTER	6th Semester
COURSE TITLE	New trends in Floriculture		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Skill Development
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

The students attending this course and participating in the labs:
1. get familiar with the greenhouse operation and management
2. obtain experience with the use of cutting rooting systems
3. obtain skills in using floriculture machinery, devices and instruments
4. obtain basic knowledge on floral production and get good grounding in understanding the special courses in floriculture.

General Skills Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Practical application of knowledge Adaptation to new situations Decision making Working in an interdisciplinary environment Promoting free, creative and inductive reasoning	

3. COURSE CONTENT

Statistical and economic information on floricultural production. International commence of flower produce. Applications of supplemental and photoperiodic light, as well as carbon dioxide in floricultural cultivation. Production and trade of floricultural propagation material. Rooting systems. Micro-propagation of floricultural species. Cultivation of rose, carnation, chrysanthemum, gerbera, gypsophila, and tulip for cut flowers. Cultivation of gardenia as pot plant. General aspects of indoor and outdoor ornamental plants

Practicals: Greenhouse operation and management for floricultural crop production. Greenhouse heating, cooling and shading. Soil pasteurization. Supplemental and photoperiodic lighting, irrigation and liquid fertilization systems. Benches, floricultural equipment and instruments. Substrates and containers. Rooting systems for cuttings (intermittent mist, fog, aeroponics). Field trips to floricultural markets, greenhouses and nurseries.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Communication with students **Description** Use of ICT in Course Teaching, in Laboratory Education, in Communication with students elearning.auth.gr : educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.auth.gr and emails,...

Final test grading assisted by electronic means

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Laboratory	26
writingProject	35
BibliographyAnalysis	65
Examinations	3
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

Written Exam with Multiple Choice Questions (Formative, Summative) Written Exam with Short Answer Questions (Formative, Summative) Labortatory Assignment (Formative, Summative) Written exams 70% Lab exams 30%

Student Evaluation Languages

English

Student evaluation methods

- MultipleChoice (Summative)
- ShortAnswerQuestions (Summative)
- LaboratoryAssignment (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

-Nelson, P.V. 2002. Greenhouse Operation and Management. Prentice-Hall, Englewood Cliffs, N. Jersey (6th edition).
-Larson R. 1992. Introduction to Floriculture. 2nd ed. Academic Press
-Hatzilazarou S. 2021. Notes from the lesson presentations, Thessaloniki-Greece

Water Resources and Irrigation Engineering

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS604	**SEMESTER**	6th Semester
COURSE TITLE	Water Resources and Irrigation Engineering		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Identify and explain the fundamental components of agricultural water resources and the principles of agro-hydrology, including soil–water–crop interactions.
Calculate crop water requirements and irrigation needs using established approaches and modern decision-support tools.
Develop and evaluate optimized irrigation scheduling strategies that enhance water use efficiency under varying environmental and operational constraints.
Design components of on-farm irrigation systems and collective irrigation networks based on hydrological, hydraulic, and environmental criteria.
Assess surface water resources for agricultural use by interpreting quantitative and qualitative data.

Assess groundwater resources for agricultural use by interpreting quantitative and qualitative data.
Interpret and evaluate key water quality parameters relevant to irrigation and their implications for soil health and sustainable crop production.
Apply smart farming technologies and precision irrigation tools (e.g., sensors, remote sensing, GIS) to support sustainable water management in agriculture.
Analyze and understand agricultural water policies and regulatory frameworks and assess their impact on water management and climate-resilient agricultural systems.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Decision making
Autonomous work
Working in an interdisciplinary environment
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Introduction to agricultural water resources management. Methods for estimating crop water requirements, alongside the calculation of irrigation water needs, and the development of optimized irrigation scheduling strategies. Overview of on-farm irrigation systems and collective irrigation network design and optimization. Groundwater and surface water hydrology in the context of agricultural water supply. Key water quality parameters relevant to irrigation. Integration of smart farming technologies and precision irrigation practices to enhance water use efficiency. Analysis of agricultural water policies and regulatory frameworks supporting sustainable and climate-resilient water management in agriculture.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** elearning.auth.gr : educational materials available to students along with

	exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.aut.gr and emails,… Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	<table><tr><th>Activity</th><th>Workload/semester</th></tr><tr><td>Lectures</td><td>65</td></tr><tr><td>writingProject</td><td>35</td></tr><tr><td>StudyCreation</td><td>65</td></tr><tr><td>Examinations</td><td>3</td></tr><tr><td>Total</td><td>168</td></tr></table>
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Assignment, and final written exams in English. Assessment methods: Written Exam with Multiple Choice Questions (Formative, Summative) Written Assignment (Formative, Summative) **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Formative) • EssayDevelopmentQuestions ()

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Waller, P., & Yitayew, M. (2015). Irrigation and drainage engineering. Springer.
Mays, L. W. (2011). Ground and surface water hydrology. Wiley.

Entomology applied in Agriculture

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS605	SEMESTER	6th Semester
COURSE TITLE	Entomology applied in Agriculture		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, the students will be able to:
Familiarize with basic biology of insects and understand their role in agroecosystems
Describe the morphological features of various insect life stages and the life cycle of insects of agricultural importance.
Distinguish harmful and beneficial insects
Propose control approaches for various insect pests
Design and apply Integrated Pest Management (IPM) in agricultural commodities.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Search, analysis and synthesis of data and information, ICT Use
Decision making
Respect for the natural environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Module 1: Insect diversity and ecology
Description: Insect phylogeny and diversity. Role in environment and impact on humans. The role of climate change on insect ecology

Module 2: Insect structure and function
Description: Morphology, internal anatomy, physiology, adaptation to different environments

Module 3: Insect development and Life cycle
Description: Reproduction, metamorphosis, hormone regulation, diapause and adaptation to abiotic stress

Module 4: Insect behavior and sociality
Description: Insect communication, movement, foraging behavior, mating behavior

Module 5: Insect symbiosis
Description: The role of symbiotic organisms in insect adaptation, development and reproduction. The insect microbiome.

Module 6: Insect-plant interactions
Description: Plants as food of insects, plant defenses, impact of insects to plants, how herbivore insects become pests, mutualisms, pollination.

Module 7: Assessing the impact of insects on crops.
Description: Insect sampling and damage to agricultural crops. Economic Thresholds and Economic Injury Levels

Module 8: Cultural and mechanical control of insects
Description: Crop rotation, Sanitation, Trap cropping, Planting practices, Soil management, removal, physical barriers and other technological means (temperature control, radiation).

Module 9: Biological control of insect pests
Description: Biology of Insect parasitoids, predators and insect pathogens. Strategies of biological control, and agroecology.

Module 10: Conventional and green insecticides (botanicals)
Description: The mode of action of chemical and botanical insecticides, management of insecticide resistance. Botanical and other low risk insecticides.

Module 11: Semiochemicals and insect control
Description: The use of pheromones and other semiochemicals for insect monitoring and control.

Module 12: Biotechnological methods for pest control
Description: Development of resistant plant varieties, harnessing insect symbionts for pest control, Sterile Insect Technique.
Module 13: Insects of stored product pests and urban environments
Description: The impact of insects on post-harvest production and their management tactics. Insects of public health importance

Laboratory exercises: Insect taxonomy and pest control
Identification and features of major insect orders orthoptera, Hemiptera, Dermaptera, Thysanoptera, Lepidoptera, Coleoptera, Hymenoptera, Diptera. Collecting and curating insects. Demonstration of insect control tools (videos, laboratory exercises)

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Teaching and Lab Software: Teaching with electronic presentations (slides, video, etc.) and e-learning platform (elearning.auth.gr : educational materials available to students), communication via elearning.aut.gr and emails, final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	80
StudyCreation	20
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Assessment Language: English, 100% written exams (multiple choice test, short answer questions, problem solving) **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Summative) • ShortAnswerQuestions (Formative) • ProblemSolving (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Gullan, P.J. and Cranston, P.S. (2010) The Insects An Outline of Entomology. Blackwell Publishing, Hoboken, NJ, 584 p.
E. B. Radcliffe, W. D. Hutchison & R. E. Cancelado [eds.], Radcliffe's IPM World Textbook, URL: https://ipmworld.umn.edu

Controlled Environment Systems (Livestock and Plants)

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS606	**SEMESTER**	6th Semester
COURSE TITLE	Controlled Environment Systems (Livestock and Plants)		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

- Understand the principles and operation of controlled environment systems used for livestock and plant production.
- Identify and manage environmental parameters (temperature, humidity, light, CO_2, ventilation) affecting productivity and welfare.
- Evaluate technologies for precision climate control, automation, and monitoring.
- Apply sustainable management practices to optimize resource efficiency.
- Integrate welfare, productivity, and environmental sustainability into the design and operation of controlled systems.

General Skills Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Practical application of knowledge Decision making Teamwork Critical thinking	

3. COURSE CONTENT

1 Introduction to Controlled Environment Systems (Concepts and history of Controlled Environment Agriculture (CEA); importance in sustainable food systems).
2 Environmental Parameters and Their Importance; Effects of temperature, humidity, light, and gaseous microenvironment on livestock and plant growth and productivity.
3 Measurement and Monitoring Technologies (Sensors and data-logging systems; IoT applications in agriculture.)
4 Heating and Cooling Systems (Energy transfer, heating methods, evaporative cooling, energy efficiency).
5 Ventilation and Air Flow Management (Natural and mechanical ventilation systems; air quality and welfare).
6 Lighting Systems and Photobiology (Light spectrum, intensity, and duration; lighting systems for plant growth and animal performance).
7 Automation and Control Strategies (Sensors–actuators, control algorithms, automation systems, data-driven management).
8 Controlled Environment Systems for Plants (Design and operation of greenhouses, growth chambers, hydroponics, and vertical farming).
9 Controlled Environment Systems for Livestock (Housing design for different species; microclimate management; thermal comfort indices; waste and manure management).
10 Integration of Livestock and Plant Systems (Circular resource use; waste-to-nutrient recycling; aquaponics and biogas utilization; system interconnections.).
11 Sustainability and Energy Management (Renewable energy applications, environmental impact).
12 Case Studies and Emerging Technologies in controlled systems (Smart farming, automation, AI and robotics).
13 Review and Project Presentations (Student presentations of group projects; synthesis of concepts; exam preparation).

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face

USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)

Use of ICT in Teaching, in Laboratory Education, in Communication with students

USE OF ICT

- Use of ICT in Teaching
- Use of ICT in Laboratory Education
- Use of ICT in Communication with students
- Use of ICT in Evaluation of students

Description

Use of ICT in Course Teaching
Use of ICT in Laboratory Teaching
Use of ICT in Communication with Students
Use of ICT in Student Assessment
Use of ICT in lectures, laboratory work, and communication with students
Application of digital tools for data collection, monitoring, and analysis
Course materials available via e-learning platform

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	64
writingProject	13
StudyCreation	23
Examinations	3
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

a. Description of the procedure • Final written exam – 60% • Project / Laboratory work – 30% • Participation and assignments – 10% b. Assessment methods Written Exam with Multiple Choice Questions (Summative) Written Exam with Short Answer Questions (Summative) Written Exam with Problem Solving (Summative) Report (Formative) Project / Laboratory work (Formative)

Student Evaluation Languages

English

Student evaluation methods

- MultipleChoice (Summative)
- ShortAnswerQuestions (Summative)
- ProblemSolving (Summative)
- EssayReport (Formative)

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	• LaboratoryAssignment (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Firfiris, V.K.; Martzopoulou, A.G.; Kotsopoulos, T.A. CHAPTER 11—Advanced energy conservation practices in livestock buildings. In Engineering Applications in Livestock Production; Tarafdar, A., Pandey, A., Gaur, G.K., Singh, M., Pandey, H.O., Eds.; Academic Press: Cambridge, MA, USA, 2024; pp. 265–294.
Geilfus, Christoph-Martin. "Controlled environment horticulture." Colorado State University, Fort Collins, CO (2019).
Jones, Don D., William H. Friday, and Sherwood S. DeForest. "Environmental control for confinement livestock housing." (2015).

7th Semester

Ecology

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS701	SEMESTER	7th Semester
COURSE TITLE	Ecology		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** Recommended that students attend the courses Anatomy and Morphology of Plant, Agricultural Zoology, Soil Science, Systematic Botany and Plant Physiology **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon completion of this course, students will:
1. have a basic scientific knowledge of the Natural History
2. understand general ecological subjects
3. obtain the necessary background for applied agricultural and environmental disciplines.

4. develop critical thinking skills to ecological issues.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Introduction to the Science of Ecology. Ecology and Evolution. Ecosystems and communities. Terrestrial biomes. Energy and productivity in ecosystems. Food relations, Food webs in ecosystems. Biogeochemical cycles. Greenhouse effect. Nutrient budgets in ecosystems. Adaptations of organisms to the environment. Growth and regulation of population. Demography. Intra-specific competition. Interspecific (biotic) interactions (competition, predation, mutuality, cooperation) - Homeostasis of the ecosystem. Development and evolution of the ecosystem (Succession).

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students

Description

Use of ICT in Course Teaching
Use of ICT in Laboratory Teaching
Use of ICT in Communication with Students
Use of ICT in Student Assessment
elearning.auth.gr : educational materials available to students along with exercises
Teaching with electronic presentations (slides, video, etc.)
Laboratories/workshops on computer systems, communication via elearning.aut.gr and emails,...
Final test grading assisted by electronic means

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	52
Other	13
StudyVisits	12
writingProject	85
Examinations	6
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

Written Exam with Multiple Choice Questions Written Exam with Short Answer Questions Written Exam with Extended Answer Questions Written Exam with Problem Solving Written Assignment Report

Student Evaluation Languages

English

Student evaluation methods

- MultipleChoice (Summative)
- ShortAnswerQuestions (Summative)
- EssayDevelopmentQuestions (Summative)
- ProblemSolving (Summative)
- WrittenAssignment (Summative)
- EssayReport (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Krebs C.J. 2001. Ecology: The Experimental Analysis of Distribution and Abundance, 5th Edition. Benjamin Cummings.
Begon M., Townsend C.R., Harper J.L. 2021. Ecology: From Individuals To Ecosystems 5th Edition. John Wiley and Sons Ltd.

Sustainable Oenology and Wine Production

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS702	**SEMESTER**	7th Semester
COURSE TITLE	Sustainable Oenology and Wine Production		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** Food Chemistry, General and Food Microbiology, Food Analysis **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, students will be able to describe and explain basic winemaking workflows and practices, including grape and must processing, fermentation management, wine stabilization, bottling, and storage. They will be able to interpret international quality standards and OIV (International Organization of Vine and Wine) general principles of resilient and sustainable vitiviniculture, considering environmental challenges, climate change impacts, resource scarcity, socio-cultural aspects. Students will be able to describe and explain chemical, biochemical, and technological processes behind sustainable winemaking with emphasis on low-energy processes, reduction of additives, use of alternative clarification treatments / products and the production of low-alcohol wines. They will also learn to analyse and evaluate case studies of sustainable wineries and propose evidence-based improvements.

General Skills Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning

Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Teamwork
Working in an international environment
Production of new research ideas
Project design and management
Respect for the natural environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Introduction to oenology and fundamental winemaking practices
Basic winemaking techniques (red, white, rosé, sparkling). Chemical and biochemical principles of grape processing, fermentation, and wine stabilization/aging.
Climate change impacts on grape composition, fermentations and wine quality
Regulatory frameworks, OIV (International Organisation of Vines) guidelines for sustainable vitiviniculture and responsible wine consumption
Reduction of SO_2 and use of alternative strategies/use of alternatives
Circular economy and green processing: waste and by-product valorization (grape pomace, yeast lees), low-energy operations
Sustainable packaging and supply-chain considerations
Case studies: sustainable wineries, innovative production and management practices (water and energy management in wineries)
Future trends in sustainable oenology: precision oenology, process monitoring tools

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students **Description**

– Use of ICT in teaching
– Use of ICT in communication with students
– Use of ICT in Laboratory education
– Use of ICT in evaluation of students

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Laboratory	26
StudyCreation	30
StudyVisits	10
BibliographyAnalysis	60
Examinations	3
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

Methods: Formative – Written exam with short-answer questions – Written exam with essay development questions – Written exam with multiple-choice questions – Written exam with problem-solving – Presentation in audience – Essay for field exercise Students are informed about the assessment methods during the first lecture and via the e-learning platform.

Student Evaluation Languages

English

Student evaluation methods

- MultipleChoice (Formative)
- ShortAnswerQuestions (Formative)
- EssayDevelopmentQuestions (Formative)
- ProblemSolving (Formative)
- PublicPresentation (Formative)
- FieldReport (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

-

Additional bibliography for study

OIV General principles of sustainable vitiviniculture- Environmental- Social- Economic and Cultural aspects, RESOLUTION OIV-CST 518-2016, OIV general principles of sustainable vitiviniculture - environmental - social - economic and cultural aspects, www.oiv.int
OIV guidelines for the sustainable production of grape juice, concentrated juice and for processing, RESOLUTION OIV-VITI 654-2021, OIV guidelines for the sustainable production of grape juice, concentrated juice and for processing, www.oiv.int
Wei, R., Wang, L., Ding, Y., Zhang, L., Gao, F., Chen, N., … Wang, H. (2022). Natural and sustainable wine: a review. Critical Reviews in Food Science and Nutrition, 63(26), 8249–8260. https://doi.org/10.1080/10408398.2022.2055528
Handbook of Enology, Pascal Ribéreau-Gayon, Yves Glories, Alain Maujean and Denis Dubourdieu. © 2021 John Wiley & Sons Ltd. Published 2021 by John Wiley & Sons Ltd.

Food Engineering

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS703	SEMESTER	7th Semester
COURSE TITLE	Food Engineering		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** Students should have basic background in Mathematics, Physics, Chemistry as well as in the Principles of Food Processing and Preservation **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon completion of this course, students will be able to:
understand the transport phenomena that take place during food processing
become familiar with basic mass, momentum and energy transfer processes
become familiar with the process of determining operational parameters of food processing processes
practice developing production process flow charts
understand the application of mass and energy balances in processes and production processes
practice sizing required production process equipment

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Working in an interdisciplinary environment
Production of new research ideas
Project design and management
Respect for the natural environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Fundamentals of engineering: thermal properties of foods, forms of heat, mass and energy balances, steam properties tables. Momentum transfer: flow types, Reynolds number, flow induced friction, mechanical energy balance-Bernoulli equation. Heat transfer: heat transfer mechanisms, conduction, convection, radiation, ohmic and microwave heating, steady and unsteady heat transfer. Mass transfer: Fick law, mass transfer coefficients, diffusion equations. Momentum transfer processes/equipment. Heat transfer processes/equipment. Mass transfer processes/equipment. Mixed transfer processes/equipment. Physical separation processes/equipment. Size and shape modification processes/equipment. Flow charts in food processing. Principles of equipment design and equipment selection. Principles of energy management in the food industry.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Elearning.auth.gr: educational materials available to students along with

	exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.aut.gr and emails Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	<table><tr><th>Activity</th><th>Workload/semester</th></tr><tr><td>Lectures</td><td>39</td></tr><tr><td>Tutoring</td><td>26</td></tr><tr><td>StudyVisits</td><td>18</td></tr><tr><td>BibliographyAnalysis</td><td>85</td></tr><tr><td>Total</td><td>168</td></tr></table>
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Description Tests and written exams at the end of semester Student Assessment methods Written Exam with Multiple Choice Questions (Formative, Summative) Written Exam with Short Answer Questions (Formative, Summative) Written Exam with Problem Solving (Formative, Summative) The evaluation criteria are listed on the course's online page on the elearning platform. **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Formative, Summative) • ShortAnswerQuestions (Formative, Summative) • ProblemSolving (Formative, Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

Additional bibliography for study

Fundamentals of Food Engineering. D.G. Rao. Second Edition, 2023.
Handbook of Food Engineering. D.R. Heldman & D.B. Lund. Second Edition. CRC Press, 2007.
Introduction to Food Engineering. R. Paul Singh & Dennis R. Heldman. Fifth Edition. Academic Press, 2014.

Breeding & Plant Propagation

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS704	**SEMESTER**	7th Semester
COURSE TITLE	Breeding & Plant Propagation		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Specialty / Orientation
PREREQUISITES	**PREREQUISITES** GENETICS **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

- Understand the principles of Plant Breeding and combine classical, molecular and biotechnological approaches for the production of new crop varieties
- Become familiar with the design of field experiments and simple breeding programs
- Practice in participatory observation, collaboration and the collection of bibliographic data.
- Become familiar with the organization and presentation of individual or group work to a wide audience
- Become aware of methodological and practical issues related to the applications of Plant Breeding and Biotechnology in Agriculture
- Learn about the value of plant propagation material, seed production and Technologies in Agriculture.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Decision making
Autonomous work
Teamwork
Production of new research ideas
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

The importance of plant breeding in Agriculture
The reproductive system of plants and its importance in plant propagation and breeding.
Seed, Self-pollination, Cross-pollination, Asexual and Innate Reproduction, Propagating Material, Varieties
The concepts of phenotype, genotype and interaction with the environment.
Assessment of GxE interactions and application of appropriate experimental designs.
Types of cultivars (pure lines, populations and hybrids).
Application of Improvement design and plant breeding programs.
Genetic basis and selection criteria. Test for combining ability and Diallelic crosses
Heterosis and Male sterility for the production of new hybrids.
Examples in Main Crops, Horticultural and Ornamental Plants
Methods of improvement, selection and evaluation.Mass selection, Pedigree & Pure line Selection processes
Backcross method and evaluation of promising lines (varieties).
Applications of biotechnology in plant breeding.
Utilization of in-vitro techniques in plant breeding as a tool in the production of new varieties.
The achievements of Genetic engineering in plant breeding.
Production of transgenic plants (GMO). Genetic modification systems.
Expression of transgenes. Detection and Controls of genetically modified plants and their products.
Creation of varieties with resistance to herbicides, insects, bacteria, viruses.
Perspectives and concerns from the applications of biotechnology in agricultural practice.
Applications of Molecular Markers in plant breeding.
Breeding for Sustainability.
Organic and Participatory Breeding. Breeding for resistance to abiotic stress and Low input Farming Systems
Plant Propagation & Seed production.
Technologies and methodologies for Hybridization, Control and Identification of Seed Germination and Viability, Certification, DUS, Conservation, , Biodiversity-Gene Flow. Seed Marketing. EU Legislation for PGR

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT for Teaching, in Laboratory Education and student's projects assignment
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** • Final written exam – 60% • Project / Laboratory work – 20% • Participation and assignments – 20% **Student Evaluation Languages** English **Student evaluation methods** • EssayDevelopmentQuestions (Summative) • LaboratoryAssignment (Summative) • WrittenAssignment (Summative)

Activity	Workload/semester
Lectures	52
Laboratory	13
BibliographyAnalysis	67
writingProject	12
StudyCreation	20
Examinations	4
Total	**168**

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

SCIENTIFIC JOURNALS
Plant Breeding, Eyphytica, Agronomy, Plant Science, Frontiers in Plant Science, Crop improvement, PUBMED journals
Principles of Plant Genetics and Breeding. George Acquaah (2nd Ed)

Physiology of reproduction of farm animals

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS705	SEMESTER	7th Semester
COURSE TITLE	Physiology of reproduction of farm animals		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** Students are recommended to have some background on Animal Biology, Animal Physiology and Genetics in order to follow the class more efficiently **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successfully completing the course, students will be able to:

1. They have acquired basic knowledge of the physiological mechanisms involved in the reproduction of farm animals.
2. Know the function of the reproductive system of farm animals.
3. Understand the mechanisms of fertilization and embryonic development.
4. Know the reproductive endocrinology of farm animals.
5. Apply the basic techniques of fertilization and embryo transfer.

6. Know the genetic mechanisms involved in the reproduction of farm animals.
7. Apply genetic techniques and design reproductive management schemes based on genetic molecular markers.
8. Know the basic principles of Precision Livestock Farming in the Reproduction of Farm Animals.
9. Understand the effects of climate change in the reproductive parameters.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Module 1: Male and Female Reproductive System
Description: Anatomy and Physiology of Male and Female Reproductive System
Module 2: Oestrous Cycles
Description: Puberty, Photoperiod, Follicular Development
Module 3: The Role of the Nervous System in Reproduction
Description: Hypothalamic Pituitary Axis
Module 4. Reproductive Endocrinology
Description: Endocrine System, Endocrine Glands
Module 5: Hormones Involved in Reproduction
Description: Hormones, Hormone Receptors, Endocrine Disruptors
Module 6: Gametogenesis
Description: Oogenesis, Spermatogenesis, Mitosis, Meiosis
Module 7: Fertilization
Description: Sperm Maturation, Sperm Activation, Acrosome Reaction
Module 8: Embryonic Development
Description: Basic Principles of Mammalian and Avian Embryonic Development
Module 9: Reproductive Biotechnology

Description: Basic Principles of Reproductive Biotechnology, Artificial Insemination, Embryo Transfer
Module 10: Precision Livestock Farming in Animal Reproduction
Description: Basic Principles of Precision Livestock Farming, Applications of Precision Livestock Farming in Farm Animal Reproduction
Module 11: Climate Change and Reproduction
Description: Impact of Climate Change on Reproductive Parameters
Module 12: Genetic Technology
Description: Applications of Genetic Technologies in Farm Animal Reproduction, Application of genomic analyses in reproductive management schemes
Module 13: Genetic Polymorphisms, Functional Molecular Markers
Description: Effect of genetic polymorphisms on reproductive function, Identification of Functional Molecular Markers

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students **Description** Educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops, communication via elearning.aut.gr and emails Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others	**Description** Assessment includes: • Final written exam (80%) with short-answer questions • Presentation and submission of a group case-study project (20%). **Student Evaluation Languages** English

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	22
writingProject	40
Other	38
Examinations	3
Total	**168**

Please indicate all relevant information about the course assessment and how students are informed	**Student evaluation methods** • ShortAnswerQuestions (Summative) • WrittenAssignment (Summative) • PublicPresentation (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Anatomy and Physiology of Farm Animals, 9th Edition
A.D. Fails, C. Magee, ISBN: 978-1-394-18792-8
Reproduction in Farm Animals, 7th Edition
E.S.E. Hafez (Editor), B. Hafez (Editor), ISBN: 978-1-118-71028-9

Nutrition and Metabolism with Mediterranean Diet Insights

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS706	SEMESTER	7th Semester
COURSE TITLE	Nutrition and Metabolism with Mediterranean Diet Insights		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successfully completing the course, students will be able to:

1. They have acquired basic knowledge of the physiological mechanisms involved in the reproduction of farm animals.
2. Know the function of the reproductive system of farm animals.
3. Understand the mechanisms of fertilization and embryonic development.
4. Know the reproductive endocrinology of farm animals.
5. Apply the basic techniques of fertilization and embryo transfer.
6. Know the genetic mechanisms involved in the reproduction of farm animals.

7. Apply genetic techniques and design reproductive management schemes based on genetic molecular markers.
8. Know the basic principles of Precision Livestock Farming in the Reproduction of Farm Animals.
9. Understand the effects of climate change in the reproductive parameters.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Decision making
Autonomous work
Teamwork
Production of new research ideas
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Module 1: Male and Female Reproductive System
Description: Anatomy and Physiology of Male and Female Reproductive System
Module 2: Oestrous Cycles
Description: Puberty, Photoperiod, Follicular Development
Module 3: The Role of the Nervous System in Reproduction
Description: Hypothalamic Pituitary Axis
Module 4. Reproductive Endocrinology
Description: Endocrine System, Endocrine Glands
Module 5: Hormones Involved in Reproduction
Description: Hormones, Hormone Receptors, Endocrine Disruptors
Module 6: Gametogenesis
Description: Oogenesis, Spermatogenesis, Mitosis, Meiosis
Module 7: Fertilization
Description: Sperm Maturation, Sperm Activation, Acrosome Reaction
Module 8: Embryonic Development
Description: Basic Principles of Mammalian and Avian Embryonic Development
Module 9: Reproductive Biotechnology
Description: Basic Principles of Reproductive Biotechnology, Artificial Insemination, Embryo Transfer
Module 10: Precision Livestock Farming in Animal Reproduction
Description: Basic Principles of Precision Livestock Farming, Applications of Precision Livestock Farming in Farm Animal Reproduction
Module 11: Climate Change and Reproduction

Description: Impact of Climate Change on Reproductive Parameters
Module 12: Genetic Technology
Description: Applications of Genetic Technologies in Farm Animal Reproduction, Application of genomic analyses in reproductive management schemes
Module 13: Genetic Polymorphisms, Functional Molecular Markers

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD
Face to face, Distance learning, etc.

Face to face

USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)
Use of ICT in Teaching, in Laboratory Education, in Communication with students

USE OF ICT
- Use of ICT in Teaching
- Use of ICT in Laboratory Education
- Use of ICT in Communication with students

Description
Educational materials available to students along with exercises
Teaching with electronic presentations (slides, video, etc.)
Laboratories/workshops, communication via elearning.aut.gr and emails
Final test grading assisted by electronic means

TEACHING ORGANIZATION
The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Seminars	15
Laboratory	26
FieldExercise	10
BibliographyAnalysis	39
StudyCreation	39
Total	**168**

STUDENT EVALUATION
Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description
Assessment includes: • Final written exam (80%) with short-answer questions • Presentation and submission of a group case-study project (20%).

Student Evaluation Languages
English

Student evaluation methods

- MultipleChoice (Summative)
- ShortAnswerQuestions (Summative)

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	• EssayDevelopmentQuestions (Summative) • WrittenAssignment (Summative) • OralExam (Summative) • PublicPresentation (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

Additional bibliography for study

Anatomy and Physiology of Farm Animals, 9th Edition
A.D. Fails, C. Magee, ISBN: 978-1-394-18792-8
Reproduction in Farm Animals, 7th Edition
E.S.E. Hafez (Editor), B. Hafez (Editor), ISBN: 978-1-118-71028-9

Landscape architecture

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS707	SEMESTER	7th Semester
COURSE TITLE	Landscape architecture		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, students will:
be familiar with the history and theory fundamentals of Landscape Architecture,
be familiar with the fundamentals of Landscape Planning and its role in agricultural and suburban landscapes
be able to design a small or medium scale landscape architecture project i.e. garde
Understand and apply landscape analysis on a small to medium scale landscape
Indulged into team work in order to apply landscape analysis on a small to medium scale landscape
Indulge into team work in order to co-design a medium scale urban or suburban landscape (i.e recreational and tourism grounds, parks, university campus)

Be aware of what a Landscape Architecture Study comprises of (set of drawings) and which other disciplines it involves
Presenting team work in class

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Autonomous work
Teamwork
Working in an interdisciplinary environment
Respect for the natural environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Module 1. Introductory lesson on Landscape Architecture: definition, studies in the Department of Agriculture, , famous works of landscape architecture, sketches and scales.

Module 2. Introductory lesson on Landscape Planning

Module 3. History of Landscape Architecture: From antiquity to the Renaissance Italian gardens.

Module 4. History of Landscape Architecture: From the French formal gardens to the present day.

Module 5. Techniques on designing landscapes; the meaning of scale, architectural drawing, basics on architectural design.

Module 6. Site analysis: Recording and documenting all the factors that create a comprehensive landscape analysis.

Module 7.
(a) Basic theoretical design principles: unity, functionality, simplicity, scale.
(b) Main elements of landscape composition: line, shape, texture, color, variety, repetition, balance, emphasis.
(c) Basic design principles: spatial organization, spatial connection, connection of elements, space dominance, form and shape, connection of geometric forms, rhythm.

Module 8 Use of plants in landscape architecture: planting dimensions, cultivation requirements, ecological, functional, and aesthetic properties of plants.

Module 9 Topography, contour lines, slope calculation.

Module 10 Basics of irrigation, lighting and construction details.

Module 11 A brief introduction to nature based solutions, works with nature, ecological design and planning.

Module 12. A brief introduction to Landscape Planning.
Module 13. Planning and Designing Rural Landscapes.

The course contains 4 assignments/projects (which are worked by students on practicals -laboratories and homework):
Assignment 1: creating freehand sketches with the aid of photographs and tracing paper
Assignment 2: Scales
Assignment 3: Creating a 800sm garden with the aid of the orthogonal grid
Assignment 4: Team work; landscape analysis and design of a 1-2K sm landscape

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching, in Laboratory Education, in Communication with students. Teaching with electronic presentations (slides, video, etc.) and e-learning platform (elearning.auth.gr: educational materials available to students), communication via elearning.aut.gr and emails, final test grading assisted by electronic means.
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	26
Laboratory	39
StudyCreation	80
FieldExercise	20
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** 80% assignment/projects, 20% written exam (short answer questions) **Student Evaluation Languages** English **Student evaluation methods** • ShortAnswerQuestions (Formative) • LaboratoryAssignment (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Holden R., and Liversedge J., 2014. Landscape Architecture, An Introduction. Laurence King Publishing, 9781780672700
Tsalikidis Ioannis, A., 2008. Landscape Architecture, Introduction to Theory and Practice. Epikentro Publishing (in Greek)

8th Semester

Vegetable crop production

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS801	SEMESTER	8th Semester
COURSE TITLE	Vegetable crop production		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, the students will be able to:
1. Identify major vegetable crop groups and their botanical, ecological, and nutritional characteristics.
2. Explain the principles of vegetable growth, development, and physiology relevant to crop production.
3. Describe suitable cultural practices such as land preparation, nursery management, planting, fertilization and irrigation.
4. Identify abiotic factors influencing vegetable growth and development.

5. Assess postharvest practices to maintain quality, reduce losses, and ensure marketability of vegetable products.
6. Compare different substrates and hydroponic system designs.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Adaptation to new situations
Decision making
Respect for the natural environment
Critical thinking

3. COURSE CONTENT

Module 1: Introduction to Vegetable Crop Production
Description: Importance and scope of vegetable production, classification of vegetable crops, opportunities and challenges in the vegetable industry

Module 2: Soil and climate requirements
Description: Role of environmental factors (light, temperature etc) and soil on vegetable growth and quality

Module 3: Nursery management and crop establishment
Description: Seed selection and seed technologies, seedlings production, transplanting techniques and schedules

Module 4: Sustainable Vegetable Production
Description: Organic fertilization, sustainable and climate-smart production technologies

Module 5: Postharvest handling
Description: Maturity indices, packaging, quality control and reduction of postharvest losses

Module 6: Principles of greenhouse production
Description: Protected cultivation (greenhouses, shade net houses), climate control

Module 7: Hydroponic cultivation
Description: Substrates, preparation of nutrient solution

Module 8: Fertigation of vegetables
Description: nutrient requirements, physiological disorders

Module 9: Major leafy vegetables

Description: Production guides for major leafy vegetables

Module 10: Major root and tuber vegetables
Description: Production guides for major root and tuber vegetables

Module 11: Major bulb and stem vegetables
Description: Production guides for major bulb and stem vegetables

Module 12: Major fruit vegetables I
Description: Production guides for major fruit vegetables (tomato, pepper, eggplant)

Module 12: Major fruit vegetables ii
Description: Production guides for major fruit vegetables (cucumber, melon)

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD
Face to face, Distance learning, etc.

Face to face
Distance learning

USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)
Use of ICT in Teaching, in Laboratory Education, in Communication with students

USE OF ICT
- Use of ICT in Teaching
- Use of ICT in Laboratory Education
- Use of ICT in Communication with students

Description
Teaching and Lab Software: Teaching with electronic presentations (slides, video, etc.) and e-learning platform (elearning.auth.gr : educational materials available to students along with exercises), communication via elearning.aut.gr and emails, final test grading assisted by electronic means

TEACHING ORGANIZATION
The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	56
writingProject	44
Examinations	3
Total	**168**

STUDENT EVALUATION
Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in

Description
Assessment Language: English, 80% written exams (multiple choice test, short answer questions, problem solving), 20% written project

Student Evaluation Languages
English

audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Student evaluation methods** • EssayDevelopmentQuestions (Summative) • WrittenAssignment (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Jenkins, A. (ed.) (2017) Vegetable Crop Production. Callisto Reference, ISBN: 9781632397850

Apiculture and bee products

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS802	SEMESTER	8th Semester
COURSE TITLE	Apiculture and bee products		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

The course aims to provide students with adequate knowledge of the:
Morphology, biology and behavior of honey bee and bee colony
Beekeeping manipulation during the year
Management of pests and diseases
Contribution of bees to plant pollination and biodiversity
Production, quality and marketing of bee products

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Decision making
Teamwork
Respect for the natural environment

3. COURSE CONTENT

Global beekeeping, elements of anatomy, morphology and biology of Apis mellifera, biological cycle of honey bee, bee hive, beekeeping tools, basic beekeeping manipulations, diagnosis and treatment of basic pests and diseases, nectar and pollen producing plants for beekeeping, honeybees in pollination, production and quality of bee products (honey, pollen, propolis, royal jelly), honey market

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Teaching with electronic presentations (slides, video, etc.) and e-learning platform (elearning.auth.gr: educational materials available to students). Communication via elearning.auth.gr and emails. Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.	

Activity	Workload/semester
Lectures	39
Laboratory	26
StudyCreation	29

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	<table><tr><th>Activity</th><th>Workload/semester</th></tr><tr><td>BibliographyAnalysis</td><td>71</td></tr><tr><td>Examinations</td><td>3</td></tr><tr><td>Total</td><td>168</td></tr></table>
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Assessment Language: English Assessment Methods: written exams (multiple choice test short answer questions) (70%), written project and presentation in audience (30%) **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Formative) • WrittenAssignment ()

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Graham, J. M. (Ed.). (2015). The Hive and the Honey Bee (2015 Edition). Dadant and Sons. ISBN 0-915698-09-9

Farm Management

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS803	SEMESTER	8th Semester
COURSE TITLE	Farm Management		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Knowledge
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

By the end of this course, students will be able to:

Explain the fundamental principles of farm management and describe the role of decision-making in modern agricultural enterprises.
Analyse the structure, resources, and operations of a farm using quantitative and qualitative evaluation methods.
Apply economic concepts—such as cost analysis, profitability indicators, and risk assessment—to real farm scenarios.
Use farm planning tools and techniques, including budgeting, partial budgeting, whole-farm planning, and sensitivity analysis.
Evaluate alternative production strategies and select optimal solutions under resource, market, and policy constraints.
Assess the impact of the CAP (Common Agricultural Policy) and other policy frameworks on farm decision-making and financial

performance.
Use basic software and data analysis tools to support farm record-keeping, economic analysis, and strategic planning.
Develop a complete farm management plan, integrating technical, financial, and environmental considerations.
Communicate management recommendations effectively, both in written reports and oral presentations, using professional terminology.
Demonstrate awareness of sustainability challenges and propose management practices that enhance economic viability, resource efficiency, and environmental protection.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Autonomous work

3. COURSE CONTENT

Introduction to Farm Management
Definition, scope, and objectives
Role of the farm manager in modern agriculture
Types of farms and farming systems
Farm Resources and Production Environment
Land, labour, capital, and management
Natural, technical, and economic constraints
Farm data and record-keeping systems
Principles of Decision-Making in Agriculture (3 weeks)
Decision processes and types of decisions
Risk and uncertainty in agricultural production
Behavioural aspects of farm decision-making
Linear programming basics for farm optimisation
Economic Concepts Applied to Farm Management (3weeks)
Costs, revenues, and profit relationships
Marginal analysis and resource allocation
Economies of scale and scope
Risk and Uncertainty Management (2 weeks)
Types and sources of risk
Tools: sensitivity analysis, scenario analysis, insurance, diversification
Decision-making under uncertainty
Policy and Institutional Framework

CAP measures affecting farm structure and decisions
Environmental and rural development policies
Compliance requirements and incentives
Farm Sustainability and Innovation
Sustainable intensification and resource efficiency
Precision agriculture and digital tools in management
Diversification and resilience strategies
Case studies, real data, and practical applications

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Teaching Use of ICT in Laboratory Education Use of ICT in Communication with students Use of ICT in Evaluation of students Use of powerpoint. Laboratory exercises on the computer lab. Communication via email and online exams.
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	39
Seminars	26
BibliographyAnalysis	13
Other	39
StudyCreation	48
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a	**Description** Method Formative Written Exam with Multiple Choice Questions 40% Computer Assisted Exam 60% Student Evaluation Languages English **Student Evaluation Languages** English **Student evaluation methods**

patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	• ComputerExamination (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS
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Additional bibliography for study
Kay, R., Edwards, W., & Duffy, P. A. (2024). Farm Management (10th ed.). McGraw-Hill Higher Education. ISBN 9781264532643

Earth Observation and Geoinformatics for Agrifood Systems

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS804	**SEMESTER**	8th Semester
COURSE TITLE	Earth Observation and Geoinformatics for Agrifood Systems		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of this course, students will be able to:
1. Know the principles of Earth observation and geoinformation, in order to support maping, monitoring and decision making of agrifood systems.
2. Obtain skills in digital image processing, geographic analysis, and AI-driven spatial analysis for a wide range of applications of the agrifood sector in order to collaborate with peers and provide solutions.
3. Apply open digital tools of EO and geoinformation sector to the agrifood industry / market to in order to provide services.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Working in an international environment
Working in an interdisciplinary environment
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Module 1
Satellites, drones, GPS and their sensors
Satellite remote sensing for crop mapping, yield prediction, and soil moisture
Drone-based support for precision farming
Practical: Copernicus data for spatial variability analysis
Practical: Creation of fertilizer prescription maps

Module 2
Spectroscopy for crop health, soil analysis and food quality
Proximal sensing sensors and apps
AI-driven analysis of EO and spectral data for decision support
Practical: Spectral identification of soil properties
Practical: Apps for smart farming

Module 3
GIS, FMIS and apps for spatial analysis
Geodatabases, data levels and sources
Spatial decision support systems for food security and policy making
Practical: GIS for spatial modeling of agricultural landscapes, environmental impacts, and food accessibility
Practical: Cloud GIS for accessing analysis ready data

Module 4
Integration across scales, from precision farming to regional monitoring
Hands-on training with satellite images, drones, spectrometers, and GIS tools
Case studies using Python and open-source tools (e.g., QGIS, SNAP, Orange)
Project: Group projects to suggest solutions to a real-world agrifood problem using EO data in GIS

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD
Face to face, Distance learning, etc.

Face to face
Distance learning

USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)
Use of ICT in Teaching, in Laboratory Education, in Communication with students

USE OF ICT
- Use of ICT in Teaching
- Use of ICT in Laboratory Education
- Use of ICT in Communication with students
- Use of ICT in Evaluation of students

Description
elearning.auth.gr: educational materials available to students along with exercises.
Teaching with electronic presentations (slides, video, etc.)
Laboratories/workshops on computer systems, communication via elearning.aut.gr and emails.
Final test grading assisted by electronic means

TEACHING ORGANIZATION
The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	52
Laboratory	13
BibliographyAnalysis	37
FieldExercise	36
StudyCreation	28
Examinations	2
Total	**168**

STUDENT EVALUATION
Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description
Reports Project Multiple Choice Test

Student Evaluation Languages
English

Student evaluation methods
- LaboratoryAssignment (Formative)
- WrittenAssignment (Summative)
- MultipleChoice (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

Additional bibliography for study

75494833 Understanding Earth Observation (ISBN: 9783319256337)
91680260 Geospatial Technologies for All (ISBN: 9783319782089)
91684127 Satellite-Based Earth Observation (ISBN: 9783319748054)
91696847 Earth Observation for Land and Emergency Monitoring (ISBN: 9781118793787)

Organic Agriculture

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS805	SEMESTER	8th Semester
COURSE TITLE	Organic Agriculture		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Skill Development
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon completion of this course, students will:
Explain ecological and biological foundations of organic farming.
Evaluate soil health and implement organic soil management strategies.
Apply organic pest, weed, and disease management techniques.
Design integrated cropping systems that prioritize biodiversity and sustainability.
Interpret organic certification requirements and farm record-keeping.
Analyze environmental and economic aspects of organic farming.
Use field tools and practices to manage organic production systems.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Foundations of Organic Agriculture
Agroecology and Ecosystem Thinking
Soil Ecology & Physics
Soil Fertility and Organic Amendments
Soil and Water Management
Plant Physiology & Crop Requirements
Crop Planning and Farm Design
Seeds and Breeding for Organic Systems
Ecological Pest Management
Diseases and Weeds
Organic Certification & Standards
Farm Business & Economics
Climate, Sustainability & Future of Organic Farming
Farm design or organic production plan
Reflection on ecological, economic, and social sustainability
Student presentations

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students **Description** Use of ICT in Course Teaching Use of ICT in Laboratory Teaching Use of ICT in Communication with Students Use of ICT in Student Assessment elearning.auth.gr : educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.aut.gr and emails,... Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Process Description: 70% Written Examinations 20% Laboratory Report 10% Project Presentation Assessment Methods: Written Exam with Multiple Choice Questions Written Exam with Short Answer Questions Written Exam with Extended Answer Questions Written Exam with Problem Solving Written Assignment Presentation in audience Report **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Formative) • ShortAnswerQuestions (Formative)

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	55
Tutoring	22
writingProject	23
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	• EssayDevelopmentQuestions (Formative) • ProblemSolving (Formative) • LaboratoryAssignment (Formative) • PublicPresentation (Formative) • WrittenAssignment (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Organic Farming: Everything You Need to Know Paperback – May 15, 2007, by Peter V. Fossel (Author)
Agroecology: Leading the Transformation to a Just and Sustainable Food System (Advances in Agroecology), by Stephen R. Gliessman , V. Ernesto Méndez, et al. | Sep 30, 2022
Agroecology (Advances in Agroecology), by Stephen R. Gliessman | Feb 16, 2015
Agroecology: The Ecology of Sustainable Food Systems, Second Edition, by Stephen R. Gliessman | Nov 15, 2006
The Organic Farming Manual: A Comprehensive Guide to Starting and Running a Certified Organic Farm, by Ann Larkin Hansen | Mar 17, 2010

Sustainable aquaculture and fisheries

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS806	SEMESTER	8th Semester
COURSE TITLE	Sustainable aquaculture and fisheries		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successfully completing the course, students will be able to:
1. Know the basic principles of aquaculture and the main species that are farmed in inland and marine waters.
2. Design an aquaculture system
3. Describe the main physicochemical parameters of water that may affect aquaculture
4. Know the differences between extensive and intensive forms of aquaculture.
5. Know the principles of RAS (Recirculating Aquaculture Systems) and Biofloc.
6. Analyze the environmental risks from different forms of aquaculture such as genetic pollution and escape into the environment of farmed organisms

7. Describe the operation of a fish and shellfish hatchery
8. Make decisions on issues related to the licensing of new aquaculture units based on the implementation of European legislation
9. Know the basic principles of fish farming and nutrition
10. Apply techniques and design schemes for the genetic improvement of aquatic farmed populations

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Working in an international environment
Working in an interdisciplinary environment
Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Module 1: Physicochemical parameters of water suitable for aquaculture and fisheries
Description: Factors such as temperature, pH, dissolved oxygen, salinity and the degree to which they may affect the health of aquatic populations, Characteristics of water suitable for aquaculture
Module 2. Elements of Ichthyology and Biology of aquatic organisms
Description: Elements of anatomy and physiology of fish and shellfish, general biology of benthic organisms, systematic classification of fish
Module 3: Interactions of environment - aquaculture, Fisheries management and sustainability,
Description: The environmental footprint of aquaculture, genetic pollution from aquaculture and its impact on fisheries, the problem of overfishing
Module 4: Selection of a location for an aquaculture unit - siting of aquaculture
Description: Criteria for selecting species suitable for aquaculture
Module 5: Aquaculture systems and methods
Description: Production systems, Tank systems, Recirculated Aquaculture Systems (RAS), Biofloc
Module 6: Shellfish farming

Description: Shellfish biology, Main species farmed, Organization and techniques of shellfish farming
Module 7: Nutritional needs of fish and shellfish
Description: Basic principles of aquatic organism nutrition, Main production stages in Aquaculture, Elements of digestion and metabolism, Energy and diets, Basic characteristics of fish feed
Module 8: Algae and microalgae cultivation
Description: Basic principles of aquatic plant biology, Produced products
Module 9: Visit to aquaculture units
Module 10: Fisheries Biocommunities, Ecosystems and Functional role of fish
Description: Zoning, plankton - benthos and ichthyosis, plant communities, Mediterranean fish
Module 11: Fisheries biology and management
Description: Legislation, fish population biology and risks, invasive species, migrations
Module 12: Climate change, fisheries and aquaculture
Description: Stress, Oxygen - Metabolism - Energetics, Homeostasis
Module 13: Fish reproductive function and oyster hatchery
Description: Development of tank systems aimed at genetic selection and genetic improvement, enhancement of fish stocks and modeling of real aquatic ecosystem conditions

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students **Description** Use of ICT in Teaching, in Laboratory Education and in students projects assignment
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written	**Description** • Final written exam – 60% • Project / Laboratory work – 30% • Participation and assignments – 10% **Student Evaluation Languages** English

Activity	Workload/semester
Lectures	39
Laboratory	26
BibliographyAnalysis	64
Tutoring	13
writingProject	23
Examinations	3
Total	**168**

Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Student evaluation methods** • WrittenAssignment (Summative) • EssayDevelopmentQuestions (Summative) • Other ()

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS
Aquaculture: Farming Aquatic Animals and Plants by John S. Lucas, Wiley BlackWell
Additional bibliography for study
-

Industrial Agro-Food Process Design and Economics

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS807	SEMESTER	8th Semester
COURSE TITLE	Industrial Agro-Food Process Design and Economics		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Background
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

By the end of this course, students will be able to:
Conduct complete techno-economic feasibility studies for chemical processes, with emphasis on food processing industry.
Employ specialized software tools for the design and economic evaluation of an industrial plant.
Develop and interpret methodological flow diagrams and apply mass and energy balance principles to process systems.
Perform preliminary sizing and selection of major process equipment based on design requirements and operating conditions.
Carry out cost estimation, economic evaluation, and profitability assessment of food processing projects.
Analyze process throughput, identify bottlenecks, and propose effective debottlenecking strategies.
Optimize process operating conditions using techno-economic criteria and apply scale-up principles to industrial systems.

Determine and evaluate functional parameters in outlet streams to ensure regulatory compliance and sustainable operation.
General Skills Name the desirable general skills upon successful completion of the module Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Search, analysis and synthesis of data and information, ICT Use Decision making Teamwork Working in an interdisciplinary environment Production of new research ideas Project design and management Respect for the natural environment

3. COURSE CONTENT

The course introduces students to the application of techno-economic feasibility studies in chemical process industries, with particular emphasis on food processing industry. It is based on a thorough feasibility study of a selected industrial plant, which varies each year, and the preparation of a detailed report that constitutes an important part of the overall course grade. The course covers the development and interpretation of methodological flow diagrams and the application of mass and energy balances for process analysis. Students learn the preliminary sizing and selection of key process equipment, as well as methods for cost estimation, economic evaluation, and assessment of project profitability. To support this, the course includes an extensive lab component where students use specialized software tools for industrial plant design and economic evaluation. The course also addresses throughput analysis, identification of bottlenecks, and strategies for process optimization. Additionally, students explore the optimization of operating conditions using techno-economic criteria and the principles of process scale-up. Finally, the course examines the determination and evaluation of quality parameters in outlet streams to ensure compliance with food quality standards and sustainable operation.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching, Use of ICT in Laboratory Teaching, Use of

	ICT in Communication with Students Description: Use of Information and Communication Technologies (ICT) in teaching the course with tools of modern distance learning (ZOOM) and asynchronous education (eclass). Use of learning aids based on ICT: Excel Use of ICT in student assessment: Electronic grading (eclass, universis). Use of ICT in communication with students: eclass, email, ZOOM.
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	<table><tr><th>Activity</th><th>Workload/semester</th></tr><tr><td>Lectures</td><td>26</td></tr><tr><td>Laboratory</td><td>39</td></tr><tr><td>BibliographyAnalysis</td><td>53</td></tr><tr><td>writingProject</td><td>50</td></tr><tr><td>Total</td><td>168</td></tr></table>
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Assessment Methods: Written assignment Problem Solving Presentation in audience Laboratory report **Student Evaluation Languages** English **Student evaluation methods** • WrittenAssignment (Summative) • ProblemSolving (Summative) • PublicPresentation (Summative) • LaboratoryAssignment (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

-

Additional bibliography for study

Developing An Industrial Chemical Process: An Integrated Approach. Author, Joseph Mizrahi. Edition, illustrated. Publisher, CRC Press, 2002.
Peters, M. S., Timmerhaus, K. D., & West, R. E. (2003). Plant design and economics for chemical engineers (5th ed.). McGraw-Hill.

9th Semester

Precision Agriculture and Livestock Farming

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS901	SEMESTER	9th Semester
COURSE TITLE	Precision Agriculture and Livestock Farming		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Skill Development
PREREQUISITES	**PREREQUISITES** Earth observation and geoinformation for agrifood systems Digital systems in agriculture **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

By the end of this course, students will understand the core concepts and rationale of precision agriculture and precision livestock farming as holistic, data-informed management approaches. They will be able to explain how spatial and temporal variability in soils, crops and animal responses influences field and herd management, and use mapping and spatial analysis to support site-specific decisions. Through lab and field exercises, students will learn how to design, evaluate and improve practices in tillage, seeding, irrigation, fertilization, crop protection, yield management and post-harvest handling with the aim of increasing efficiency, product

quality and environmental performance. In the livestock context, they will be able to relate animal behaviour, health, welfare and housing conditions to precision management strategies and daily decision-making on farm. Finally, students will be able to critically assess the economic, environmental and social implications of adopting precision crop and livestock systems, identify key barriers and drivers of adoption, and discuss pathways for sustainable and context-appropriate implementation at farm and sector level.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Adaptation to new situations
Decision making
Teamwork
Working in an international environment
Working in an interdisciplinary environment
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Introduction to Precision Agriculture
Mapping and managing spatial variability within the field
Precision Tillage Systems and Controlled Traffic Farming
Precision Seeding
Precision Irrigation
Precision Fertilization
Precision Crop Protection
Yield Monitoring and Mapping
Precision Post Harvest Management
Introduction to Precision Livestock Farming
Precision Livestock Farming Applications
Precision Livestock Farming Adoption and Sustainability
Precision Agriculture Adoption and Sustainability

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face

USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)

Use of ICT in Teaching, in Laboratory Education, in Communication with students

USE OF ICT

- Use of ICT in Teaching
- Use of ICT in Laboratory Education
- Use of ICT in Communication with students
- Use of ICT in Evaluation of students

Description

Use of ICT in Course Teaching
Use of ICT in Laboratory Teaching
Use of ICT in Communication with Students
Use of ICT in Student Assessment
elearning.auth.gr : educational materials available to students along with exercises
Teaching with electronic presentations (slides, video, etc.)
Laboratories/workshops on computer systems, communication via elearning.auth.gr and emails,…
Final test grading assisted by electronic means

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Laboratory	26
Seminars	4
writingProject	52
BibliographyAnalysis	44
Examinations	3
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

Description of the procedure Final written exam – 60% Project / Laboratory work – 30% Participation and assignments – 10% b. Assessment methods Report (Formative) Project / Laboratory work (Formative) Written Exam with Multiple Choice Questions (Concluding) Written Exam with Short Answer Questions (Concluding) Written Exam with Problem Solving (Concluding)

Student Evaluation Languages

English

Student evaluation methods

- EssayReport (Formative)
- LaboratoryAssignment (Formative)
- MultipleChoice (Summative)

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	• ShortAnswerQuestions (Summative) • ProblemSolving (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Stafford, J. (Ed.). (2018). Precision agriculture for sustainability (1st ed.). Burleigh Dodds Science Publishing. (https://www.bdspublishing.com/webshop/books/agricultural-science-series/crops/agri-tech/precision-agriculture/precision-agriculture-for-sustainability/)
Kerry, R., & Escolà, A. (2021). Sensing Approaches for Precision Agriculture. Springer (https://link.springer.com/book/10.1007/978-3-030-78431-7)
Janice M. Siegford,20 - Precision livestock farming and technology in pig husbandry, Editor(s): Irene Camerlink, Emma M. Baxter, In Woodhead Publishing Series in Food Science, Technology and Nutrition, Advances in Pig Welfare (Second Edition), Woodhead Publishing, 2024,Pages 449-469,ISBN 9780323856768,https://doi.org/10.1016/B978-0-323-85676-8.00015-8.
Shannon, D. Kent, David E. Clay, and Newell R. Kitchen, editors. Precision Agriculture Basics. Madison, WI: American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America, 2018 (https://acsess.onlinelibrary.wiley.com/doi/book/10.2134/precisionagbasics)

Farm Accounting

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS902	SEMESTER	9th Semester
COURSE TITLE	Farm Accounting		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	General Knowledge
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

By the end of this course, students will be able to:

Explain the principles and functions of accounting and describe how they apply specifically to farm businesses.
Maintain accurate farm financial records using appropriate documentation, record-keeping systems, and digital tools.
Prepare and interpret key financial statements (balance sheet, income statement, cash flow statement) for different types of agricultural enterprises.
Apply valuation methods for agricultural assets, including land, livestock, machinery, inventories, and biological assets.
Calculate and allocate production costs across farm enterprises, distinguishing between fixed, variable, and overhead costs.

Use depreciation methods and evaluate their impact on farm profitability, capital replacement, and investment decisions.
Evaluate the financial performance of a farm using key liquidity, solvency, efficiency, and profitability indicators.
Apply basic concepts of budgeting and financial planning to support short-term and long-term farm management decisions.
Understand taxation and policy requirements related to farm accounting, including the treatment of subsidies and CAP payments.
Assess financial risks and uncertainties and use tools such as sensitivity analysis to support decision-making.
Communicate accounting results clearly through professional reports and presentations for farmers, advisors, and stakeholders.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Autonomous work

3. COURSE CONTENT

Introduction to Farm Accounting
Purpose and importance of accounting in farm businesses
Differences between farm accounting and general business accounting
Legal and institutional framework
Basic Accounting Principles
Double-entry bookkeeping
Assets, liabilities, equity
Revenues, expenses, and profit concepts
Cash vs accrual accounting
Farm Records and Documentation
Types of farm records (production, financial, inventory)
Record-keeping systems and tools
Digital record-keeping and farm management software
Financial Statements in Agriculture
Balance sheet: structure, valuation of assets (land, livestock, machinery)
Income statement: farm revenues, operating expenses, depreciation
Cash flow statement: cash inflows/outflows, liquidity assessment
Valuation of Farm Assets
Land valuation and revaluation
Livestock valuation (breeding, rearing, market animals)
Machinery and equipment depreciation methods
Biological assets and inventories
Cost Accounting in Agriculture

Classification of costs: fixed, variable, overhead
Enterprise cost allocation
Cost centers and activity costing
Break-even analysis
Depreciation and Capital Management
Depreciation methods (straight-line, declining balance, units of production)
Replacement and investment decisions
Impact of depreciation on profitability
Taxation and Agricultural Policies
Tax obligations for farmers
Agricultural subsidies and support schemes
Accounting treatment of subsidies (CAP payments, investment support)
Farm Budgeting and Financial Planning
Partial and whole-farm budgets
Annual budgeting and forecasting
Credit and loan management
Financial Indicators and Performance Analysis
Liquidity, solvency, profitability ratios
Benchmarking and comparison with sector standards
Interpretation for decision-making
Integrated Farm Financial Management
Linking accounting to farm planning
Decision-support tools and software
Case studies of real farm financial statements

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Teaching Use of ICT in Laboratory Education Use of ICT in Communication with students Use of ICT in Evaluation of students Use of powerpoint. Laboratory exercises on the computer lab. Communication via email and online exams.
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.	

Activity	Workload/semester
Lectures	39
Seminars	26

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
BibliographyAnalysis	39
StudyVisits	13
StudyCreation	48
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Method Formative Written Exam with Multiple Choice Questions 40% Computer Assisted Exam 60% Student Evaluation Languages English **Student Evaluation Languages** English **Student evaluation methods** • ComputerExamination (Formative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Bragg, S. M. (2022). Agricultural accounting (3rd ed.). AccountingTools, Inc.. ISBN 9781642210927
Shanks, J. (2024). The Farmer's Office: Tools, templates, and skills for starting, managing, and growing a successful farm business (2nded.). New Society Publishers. ISBN9780865719934

Digital and Predictive Food Microbiology & Quality Assurance Systems

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS903	**SEMESTER**	9th Semester
COURSE TITLE	Digital and Predictive Food Microbiology & Quality Assurance Systems		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** Microbiology and Food Microbiology, Mathematics, Chemistry **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon completion of the course, students will be able to recognize the microbial ecology of different food matrices and assess its influence on product quality, safety, and shelf-life. They will be able to evaluate the applicability and limitations of advanced molecular, digital, and analytical techniques for detecting, identifying, and quantifying foodborne microorganisms as well as chemical and physical hazards. Students will develop the capacity to evaluate food business operations against established GMP, GHP, and GAP requirements and to design or assess food safety management systems that incorporate microbiological, chemical, and physical risk assessment. Furthermore, they will be able to integrate quality assurance and quality control principles with predictive and digital monitoring systems, including HACCP, ISO 22000, and related standards. They will also learn to critically appraise emerging challenges, technologies, and innovations in food safety, digital microbiology, and predictive modelling. Finally, students will be able to interpret,

implement, and compare global regulatory, safety, and quality standards relevant to food production, processing, and distribution.
General Skills Name the desirable general skills upon successful completion of the module Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Practical application of knowledge Search, analysis and synthesis of data and information, ICT Use Decision making Working in an interdisciplinary environment Production of new research ideas Critical thinking Promoting free, creative and inductive reasoning

3. COURSE CONTENT

This course provides an advanced exploration of the role of microorganisms in food systems and their impact on food quality, safety, and shelf-life. It integrates cutting-edge microbiological tools, molecular and digital techniques, predictive microbiology, and the detection and assessment of chemical hazards (naturally occurring toxins, allergens, added chemicals, chemical residues) and physical hazards (e.g., glass, metal). The course emphasizes the principles and application of quality assurance and food safety management systems, including HACCP and ISO standards, covering system design, validation, verification, and auditing practices. Students will also examine Good Manufacturing Practices (GMP), Good Hygiene Practices (GHP), Good Agricultural Practices (GAP), as well as hygiene, sanitation, and environmental monitoring programs. Legislative frameworks governing food production are addressed, with focus on legal requirements for labeling, traceability, and crisis management. Through lectures, case studies, seminars, projects and digital exercises, students will develop advanced theoretical knowledge and practical competencies to design, implement, and evaluate microbiological and multidisciplinary quality control and food safety systems across diverse sectors of the food industry.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face Distance learning
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students **Description** Use of ICT in Teaching: electronic presentations (slides, video, etc.), use of softwares, workshops on computer systems and mathematical models Educational material: available on e-learning Communication: via e-learning/email

TEACHING ORGANIZATION
The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	39
Seminars	26
StudyCreation	26
writingProject	13
BibliographyAnalysis	64
Total	**168**

STUDENT EVALUATION
Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description
Written Multiple Choice Test (Formative, Summative) Written Assignment Presentation in audience

Student Evaluation Languages
English

Student evaluation methods

- MultipleChoice (Formative, Summative)
- WrittenAssignment (Formative, Summative)
- PublicPresentation (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

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Additional bibliography for study

Applied Predictive Microbiology
Predictive Microbiology: Theory and Application
Food Safety Management Systems
Predictive Modeling and Risk Assessment

Renewable Energy Resources in Agriculture

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS904	**SEMESTER**	9th Semester
COURSE TITLE	Renewable Energy Resources in Agriculture		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	**TEACHING HOURS PER WEEK**	**ECTS CREDITS**
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Identify major renewable energy resources applicable to agriculture.
Explain the scientific principles behind solar, wind, biomass, hydro, and geothermal systems.
Evaluate the feasibility and performance of renewable energy technologies on farms.
Recommend renewable energy solutions tailored to different agricultural scenarios.
Analyse case studies demonstrating successful implementation in various regions.

General Skills Name the desirable general skills upon successful completion of the module	
Search, analysis and synthesis of data and information, ICT Use,Adaptation to new situations, Decision making, Autonomous work, Teamwork, Working in an international environment, Working in an interdisciplinary environment, Production of new research ideas	Project design and management Equity and Inclusion Respect for the natural environment Sustainability Demonstration of social, professional and moral responsibility and sensitivity to gender issues Critical thinking Promoting free, creative and inductive reasoning
Practical application of knowledge Decision making Teamwork Critical thinking	

3. COURSE CONTENT

Introduction to renewable energy in agriculture (energy demand in agriculture, challenges with fossil fuel dependency, overview of renewable energy resources).
Solar energy principles and technologies (photovoltaics basics, solar thermal systems, solar radiation characteristics, energy conversion efficiency, solar water pumping and irrigation, solar greenhouse heating).
Solar passive systems (design principles and agricultural uses, natural greenhouse heating, crop drying, ventilation, shading, thermal mass, and farm building orientation to reduce energy demand and enhance sustainability).
Wind energy in agriculture (wind resource assessment, turbine types and mechanics, factors influencing wind power output, wind pumps, hybrid wind-solar systems)
Biomass characteristics (agricultural biomasses quantity and quality characteristics and sources (crop residues, manure, agro-industrial wastes).
Biomass valorisation (energy content and composition, technological overview (combustion, gasification, fermentation).
Biogas production and utilisation in agriculture (anaerobic digestion principles, digester types, biogas upgrading and use (electricity, heat, fuel), digestate as a fertilizer).
Other biofuels in agriculture (bioethanol, biodiesel, biobutanol, feedstocks and conversion processes, engines and machinery compatible with biofuels).
Biorefineries (pretreatment, enzymatic hydrolysis, fermentation, biomass extracting high-value products, circular economy concepts).
Geothermal energy in agriculture (geothermal principles, greenhouse heating, soil warming for early planting, hot water and thermal storage).
Hydropower systems in agriculture (hydropower fundamentals, micro- and pico-hydropower, applications (milling, pumping, electricity generation).
Heat pumps-Group project (principles, types, efficiency, agricultural uses (greenhouse heating, milk cooling, water heating, and energy recovery), cost savings, sustainability, and integration with other renewables.
Review and project presentations (student presentations of group projects, synthesis of concepts, exam preparation).

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face

USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT)

Use of ICT in Teaching, in Laboratory Education, in Communication with students

USE OF ICT

- Use of ICT in Teaching
- Use of ICT in Laboratory Education
- Use of ICT in Communication with students
- Use of ICT in Evaluation of students

Description

Use of ICT in Course Teaching
Use of ICT in Laboratory Teaching
Use of ICT in Communication with Students
Use of ICT in Student Assessment

TEACHING ORGANIZATION

The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc.

The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards

Activity	Workload/semester
Lectures	52
Laboratory	13
BibliographyAnalysis	64
writingProject	13
StudyCreation	23
Examinations	3
Total	**168**

STUDENT EVALUATION

Description of the evaluation process

Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others

Please indicate all relevant information about the course assessment and how students are informed

Description

a. Description of the procedure Final written exam – 60% Project / Laboratory work – 30% Participation and assignments – 10% b. Assessment methods Report (Formative) Project / Laboratory work (Formative) Written Exam with Multiple Choice Questions (Concluding) Written Exam with Short Answer Questions (Concluding) Written Exam with Problem Solving (Concluding)

Student Evaluation Languages

English

Student evaluation methods

- LaboratoryAssignment (Formative)
- EssayReport (Formative)
- MultipleChoice (Summative)
- ShortAnswerQuestions (Summative)
- ProblemSolving (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS

-

Additional bibliography for study

Jochen Bundschuh and Guangnan Chen eds, 2014. Sustainable energy solutions in agriculture. CRC Press. ISBN9780429227493, https://doi.org/10.1201/b16643.
John Twidell, (2021). Renewable Energy Resources (4th ed.). Routledge, London. ISBN9780429452161, https://doi.org/10.4324/9780429452161.
Bundschuh, J. and Chen, G. eds., 2014. Sustainable energy solutions in agriculture. CRC Press.
Kemal Çelik, Fatmagül Tolun, Harun Baytekin, Hilal Çelik, Maciej Dymacz, Teodora Angelova, Zuzana Palkova, Jivko Krastanov, Yovka Popova, (2019). URESA handbook for renewable energy sources-Utilization of Renewable Energy Sources In Agricultural Vocational Education. Editors: Dr. Ergün Demir, Dr. Kemal Çelik, Murat Sabri Saran. Copyright © Kemal Çelik, Academy Publications, İstanbul ISBN: 978 - 625 - 7000 - 10 – 9.

Mediterranean and Functional Foods

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS905	SEMESTER	9th Semester
COURSE TITLE	Mediterranean and Functional Foods		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	5	6.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area
PREREQUISITES	**PREREQUISITES** Students are expected to have prior knowledge in core areas of food science. Foundational courses such as Food Chemistry, Food Microbiology, and Biochemistry are recommended to ensure familiarity with the composition of foods, the behavior of bioactive compounds, and the factors influencing product quality and stability. A basic understanding of Nutrition and Metabolism with Mediterranean Diet Insigh and Food Engineering will further support students in engaging with topics related to functional properties, traditional Mediterranean products, and the valorization of agricultural by-products. **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	YES
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

Upon successful completion of the course, students will acquire comprehensive knowledge of the composition, functional properties, and health-related benefits of key Mediterranean foods, including aromatic plants, bee products, mastic gum, olive oil, Greek yogurt,

and Feta cheese. They will develop skills in identifying, analyzing, and evaluating bioactive compounds, assessing product quality and authenticity, and understanding sustainable strategies for valorizing agricultural by-products. Students will also gain abilities related to integrating scientific evidence into food innovation, critically interpreting research on functional ingredients, and applying principles of circular economy within Mediterranean food systems. Overall, graduates of the course will be equipped to contribute to research, development, and informed decision-making in the agri-food sector.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Decision making
Autonomous work
Teamwork
Working in an interdisciplinary environment
Production of new research ideas
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

The course provides students with an in-depth understanding of Mediterranean and functional foods, focusing on their composition, bioactive compounds, and health-promoting properties. It covers critical topics such as aromatic and medicinal plants (e.g., thyme, Origanum), bee products (honey, propolis, royal jelly), and mastic gum, highlighting their functional, antimicrobial, and antioxidant properties. The production, quality assessment, and health benefits of key Mediterranean products such as Greek yogurt, Feta cheese, and olive oil will be examined. Special attention will be given to the sustainable valorization of agricultural by-products and residues, including strategies for recovering bioactive compounds and developing innovative functional foods. Students will also explore traditional and modern processing methods, authenticity and quality control issues, and the application of scientific evidence in product innovation and functional food development. The course will also include delivery systems of bioactive compounds (oleogels, hybrid gels, emulsion gels, etc.) and evaluation of the delivery efficiency through in vitro digestion studies.

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Teaching • Use of ICT in Laboratory Education • Use of ICT in Communication with students

	• Use of ICT in Evaluation of students **Description** Elearning.auth.gr: educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.aut.gr and emails Final test grading assisted by electronic means
TEACHING ORGANIZATION The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	

Activity	Workload/semester
Lectures	39
Seminars	25
Laboratory	26
FieldExercise	10
BibliographyAnalysis	26
StudyCreation	39
Examinations	3
Total	**168**

STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** 90% Written Examinations, 10% Coursework and Presentation Assessment Methods: Written Examination with Multiple Choice Questions Written Examination with Short Answer Questions Written Examination with Extended Response Questions Written Assignment Oral Examination Public Presentation Written Examination with Problem Solving **Student Evaluation Languages** English **Student evaluation methods** • MultipleChoice (Summative) • ShortAnswerQuestions (Summative) • EssayDevelopmentQuestions (Summative) • WrittenAssignment (Summative) • OralExam (Summative) • PublicPresentation (Summative) • ProblemSolving (Summative)

5. SUGGESTED BIBLIOGRAPHY
EUDOXUS
-
Additional bibliography for study
-

10th Semester

Diploma Thesis

1. GENERAL

FACULTY	Faculty of Agriculture, Forestry and Natural Environment		
SCHOOL	School of Agriculture		
LEVEL OF STUDIES	ISCED level 7 – Master's or equivalent level		
COURSE CODE	SAFS1000	SEMESTER	10th Semester
COURSE TITLE	Diploma Thesis		

TEACHING ACTIVITIES If the ECTS Credits are distributed in distinct parts of the course e.g. lectures, labs etc. If the ECTS Credits are awarded to the whole course, then please indicate the teaching hours per week and the corresponding ECTS Credits.	TEACHING HOURS PER WEEK	ECTS CREDITS
	-	30.0

COURSETYPE Background, General Knowledge, Scientific Area, Skill Development	Skill Development
PREREQUISITES	**PREREQUISITES** - **General prerequisites** -
TEACHING & EXAMINATION	English
COURSE OFFERED TO ERASMUS STUDENTS	NO
COURSE URL	-

2. LEARNING OUTCOMES

Learning Outcomes
Please describe the learning outcomes of the course: Knowledge, skills and abilities acquired after the successful completion of the course.

After completing the thesis, the student will be able to:
Formulate a clear and scientifically relevant research question or hypothesis.
Conduct a comprehensive literature review and identify research gaps.
Design an appropriate research methodology (experimental, analytical, or qualitative).
Collect, manage, and analyse data using suitable statistical or modelling tools.

Interpret results in the context of sustainability in agriculture and food systems.
Critically evaluate limitations, validity, and implications of findings.
Produce a coherent, well-structured, academically rigorous written thesis.
Communicate findings through an oral presentation/defence.
Work independently and ethically in compliance with academic and research guidelines.

General Skills

Name the desirable general skills upon successful completion of the module

Search, analysis and synthesis of data and information,
ICT Use,Adaptation to new situations,
Decision making,
Autonomous work,
Teamwork,
Working in an international environment,
Working in an interdisciplinary environment, Production of new research ideas

Project design and management
Equity and Inclusion
Respect for the natural environment
Sustainability
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

Practical application of knowledge
Search, analysis and synthesis of data and information, ICT Use
Adaptation to new situations
Decision making
Autonomous work
Production of new research ideas
Project design and management
Equity and Inclusion
Respect for the natural environment
Demonstration of social, professional and moral responsibility and sensitivity to gender issues
Critical thinking
Promoting free, creative and inductive reasoning

3. COURSE CONTENT

Phase 1 — Topic Selection & Proposal (Weeks 1–4)
Identify research area
Select supervisor
Prepare a 2–5 page proposal including:
background and motivation
objectives and hypotheses
methodology (experimental plan, sampling, variables, data needs)
timeline
Proposal approval by supervisor/department
Phase 2 — Literature Review (Weeks 4–8)
Systematic review of academic sources
Conceptual framework
Identification of gaps and research justification
Phase 3 — Method Development & Preparation (Weeks 8–12)

Design experiments/surveys/models
Obtain materials, equipment, access to farms or food labs
Ethics and safety approvals (if required)
Phase 4 — Data Collection (Weeks 12–20)
Depending on project type, this may include:
Field trials, greenhouse experiments, lab analyses
Soil, plant, food, or environmental measurements
Surveys, interviews, stakeholder consultations
Food product formulation, processing, or shelf-life testing
Phase 5 — Data Analysis (Weeks 20–24)
Statistical analysis (R, SPSS, Python, Excel)
Modelling (crop models, LCA tools, sustainability indices)
Interpretation and comparison with literature
Phase 6 — Thesis Writing (Weeks 24–30)
Chapters:
Introduction
Literature Review
Materials & Methods
Results
Discussion
Conclusions & Recommendations
References
Appendices (data tables, questionnaires, protocols)
Phase 7 — Oral Defence
15–30 minute presentation
Q&A with examination committee

4. LEARNING & TEACHING METHODS - EVALUATION

TEACHING METHOD Face to face, Distance learning, etc.	Face to face
USE OF INFORMATION & COMMUNICATIONS TECHNOLOGY (ICT) Use of ICT in Teaching, in Laboratory Education, in Communication with students	**USE OF ICT** • Use of ICT in Communication with students • Use of ICT in Evaluation of students **Description** Use of ICT in Course Teaching Use of ICT in Laboratory Teaching Use of ICT in Communication with Students Use of ICT in Student Assessment elearning.auth.gr : educational materials available to students along with exercises Teaching with electronic presentations (slides, video, etc.) Laboratories/workshops on computer systems, communication via elearning.aut.gr and emails,… Final test grading assisted by electronic means

TEACHING ORGANIZATION	
The ways and methods of teaching are described in detail. Lectures, Seminars, Laboratory Exercise, Field Exercise, Bibliographic research& analysis, Tutoring, Internship (Placement), Clinical Exercise, Art Workshop, Interactive learning, Study visits, Study / creation, project, creation, project. Etc. The supervised and unsupervised workload per activity is indicated here, so that total workload per semester complies to ECTS standards	<table><tr><th>Activity</th><th>Workload/semester</th></tr><tr><td>BibliographyAnalysis</td><td>200</td></tr><tr><td>StudyCreation</td><td>438</td></tr><tr><td>writingProject</td><td>200</td></tr><tr><td>Examinations</td><td>2</td></tr><tr><td>Total</td><td>840</td></tr></table>
STUDENT EVALUATION Description of the evaluation process Assessment Language, Assessment Methods, Formative or Concluding, Multiple Choice Test, Short Answer Questions, Essay Development Questions, Problem Solving, Written Assignment, Essay / Report, Oral Exam, Presentation in audience, Laboratory Report, Clinical examination of a patient, Artistic interpretation, Other/Others Please indicate all relevant information about the course assessment and how students are informed	**Description** Written Assignment Report Presentation in audience **Student Evaluation Languages** English **Student evaluation methods** • WrittenAssignment (Summative) • OralExam (Summative) • PublicPresentation (Summative)

5. SUGGESTED BIBLIOGRAPHY

EUDOXUS
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Additional bibliography for study
Scientific journals depending on the topic of the thesis