CYPRUS UNIVERSITY OF TECHNOLOGY

Department of Agricultural Sciences, Biotechnology & Food Science

Cyprus University of Technology

Syllabi of Undergraduate Courses offered in English for Erasmus students

Courses

Autumn Semester

ABF210	Genetics
ABF310	Plant Pathology
ABF335	Zoonoses and Food Crises
ABF351	Food Biotechnology

Spring Semester

ABF218	Crop Science
ABF250	Food packaging
ABF350	Oenology
ABF353	Diary Sciences & Technology
ABF356	Food Safety & Quality
ABF415	Postharvest physiology & technology

Autumn/Sprin Semester

LCE_101	English I for Academic purposes
Lce_660	Greek language and culture

Course Title	**Genetics**				
Course Code	ABF 210				
Course Type	Theory and Labs				
Level	Undergraduate				
Year / Semester	Fall Semester/3rd Semester/2nd year				
Teacher's Name	Dr. Despina Miltiadou				
ECTS	6	Lectures / week	2 x 2 hr	Laboratories / week	1.5h x 2 groups
Course Purpose and Objectives	The course aims at understanding the concepts and theories that govern the classical genetics and basic concepts of molecular genetics, which are essential for the subsequent semesters, especially for courses such as molecular biology and genetic improvement of plants and animals. Students will become familiar with the laws of heredity of the characteristics and how they are applied to specific examples, mainly in plants and animals, and some examples in humans, aiming to link genetics to their lives and their future professional subject. By focusing on exploring examples of the concepts and principles under consideration, the course also aims at developing problem-solving skills.				
Learning Outcomes	Students are expected to be able to determine the genetic material of organisms, organelles and contaminants, its structure and how the structure is linked to its functions, will be able to determine how the genetic material is organized into chromosomes, to determine the reasons for cellular divisions and the processes of mitosis and meiosis and they will be able to connect in theory by providing examples the notions of DNA, gene, nucleic acid, allele, genetic locus, genome, chromosome and chromatid. Students are also expected to be able to distinguish different types of gene mutations and chromosomal mutations and evaluate their potential impact on organisms or their applications in agriculture, can explain the laws of heredity, and how they will determine phenotypes and phenotypic ratios in the case of applications of Mendelian genetics, its extensions, as well as examples of sex-linked and related genes. Students will be able to solve problems determining the kind of heritability of characteristics mainly on examples of agricultural plants and animals and will test by statistical test whether a hypothesis is valid as well as will be able to calculate the distance of two linked genes based on phenotypic data.				
Prerequisites		Required			
Course Content	<u>Lectures</u> 1. History of Genetics and Biochemical Background 2. The Genetic Material and the Central dogma for Molecular Genetics 3. Genes, Gene Mutations and Chromosome Structure 4. Cell cycle and cell division (mitosis, meiosis) 5. Chromosomal Variations (structure and number of chromosomes) 6. Mendelian Inheritance (monohybridism, dihybrid, segregation of 3 genes and above, statistical test x^2) 7. Applications of Mendelian Genetics (phylogenetic trees and applications in agriculture and livestock farming) 8. Mendelian Genetics Extensions (lack of dominance, epistasis, genes of incompatibility in plants, lethal genes, multiple alleles) 9. Sex linked genes and Sex Determination 10. Gene Linkage and Mapping <u>Laboratory exercises and problems</u> 1. Group separation, check of webpages to be used and guidelines 2. Construction of DNA and RNA models and three-dimensional DNA structure in PCs 3. Transcription and Translation of a gene 4. Chromosome structure in PC and quiz 5. Mutations in examples in PC and quiz				

	6. Microscopy in Mitosis and Meiosis 7. Mitosis and Meiosis tutorials in PC and quiz 8. Monohybrid cross tutorial in PC and quiz 9. Dihydride cross tutorial in PC and quiz 10. Study of corns (probabilities and chi-square test) 11. Exercises in the Extensions of Mendelian Genetics 12. Sex chromosomes and sex linked gene tutorials in computer and quiz 13. Linked gene tutorials and mapping
Teaching Methodology	Lectures Active live participation in learning activities, discussion and problem solving, problems and exercises Utilization of the interactive activities contained in the cd of the Concepts of Genetics and online interactive activities and quiz that contribute to the consolidation of the concepts of lectures and lecture applications Autonomous learning using the bibliography and suggested websites
Bibliography	1. Teaching Notes 2. Introduction to Genetics. 2nd edition, 2010, Luke Michael, STAMOULI Publications. ISBN: 9603512982 3. Concepts of Genetics, 12th edition, 2018, Klug, Cummings, Spencer, Palladino and Killian, Prentice Hall International Inc. ISBN: 978-0134604718 1. iGenetics. Peter J. Russell. 2009 Translation by Academic editions. Alexandroupolis. ISBN 978-960-88412-8-4 2. Genetic analysis and principles, 2017, 6th edition, RJ Brooker. Mc Graw Hill, ISBN: 9781259616020 3. Principles of Genetics, 2015, 7th edition, D. Peter Snustad and Michael J. Simmons, John Wiley &Sons, Inc. ISBN: 978-1-119-14228-7
Assessment	Mid-term exams 30% Final examination 50% The test paper are shaped by the lecture and lab material and include closed-type questions (multiple choice, fill-in, matching, etc.), questions of limited and extended length, critical and combinational questions, and problem solving testing the learning outcomes outlined above. Solving exercises and questions 5% Lab reports 15%
Language	Greek (All major terminology is also offered in English)

Course Title	**Zoonoses and Food Crises**				
Course Code	ABF 335				
Course Type	Theory				
Level	Undergraduate				
Year / Semester	Autumn Semester/7th Semester/4rh year				
Teacher's Name	Dr. George Botsaris				
ECTS	5	Lectures / week	2x1.5hrs	Laboratories / week	
Course Purpose and Objectives	The purpose of this course is to provide basic knowledge of animal diseases with emphasis on those that are transmitted to humans (zoonoses) directly from animals or through the food chain. The course analyzes the risk factors for health of production animals and humans, elements of epidemiology, diagnosis, prevention, intervention and bioethics. Examples of food crises related directly or indirectly to animal health and the hygienic status of animal-origin products, prevention measures to be taken and management of food crises will also be presented. The course will also present other important diseases of productive animals and will help to understand the relationship between animal health and welfare and human health.				
Learning Outcomes	Upon successful completion of the course the student will be able to: • Define zoonoses and categorize them based on the causative agent • Describe basic epidemiology and microbiology related to zoonoses of production animals • Explain the importance of control programs • Analyse the ways to diagnose and analyze the causative agents • Describe the basic characteristics of the causative agents of the zoonoses presented in the lesson and understands the investigation principles and how to manage food borne crises				
Prerequisites	No	Required	No		
Course Content	LECTURES **Introduction to Zoonoses** Module outline and definitions Basic microbiology and epidemiology EU legislation and HACCP Disease detection methods and monitoring on farm level **Prion disorders** Transmissible spongiform encephalopathies **Bacterial diseases** Tuberculosis – *Mycobacterium tuberculosis* and TB complex mycobacteria Brucellosis – *Brucella abortus* and *Brucella melitensis* Q Fever - *Coxiella burnetii* Salmonellosis – *Salmonella* spp. Listeriosis – *Listeria monocytogenes* and *Listeria ivanovii* Campylobacteriosis – *Campylobacter jejuni* Anthrax – *Bacillus antharcis* Botulism – *Clostridium botulinum* Infections with *Escherichia coli* Yersiniosis – *Yersinia enterocolitica* **Food borne viruses** Norovirus, Rotavirus and Hepatitis A and E **Parasitic infections** Trichinellosis – *Trichinella spiralis* Toxoplasmosis – *Toxoplasma gondii* Taeniasis – *Taenia saginata* and *Taenia solium* **Important production animal diseases** Foot and Mouth Disease Swine Fever				

	Avian flu Paratuberculosis – *Mycobacterium paratuberculosis* Training visits in food establishments
Teaching Methodology	Lectures using audiovisual media Active live engagement in learning activities, discussion and problem solving Solving critical thinking questions and problems Written group work and oral presentation Individual meetings for work guidance and problem solving Autonomous study utilizing bibliography and reliable websites available on the internet Two educational visits to food industries and farm establishments
Bibliography	1. Power point presentations and teaching material 2. Zoonosis: Infectious Diseases Transmissible from Animals to Humans, H. Krauss, A. Weber, M. Appel, B. Enders, H.D. Isenberg, H.G. Schiefer, W. Slenczka, A. vGraevenitz, H. Zahrer, American Society for Microbiology, 2003, ISBN 1-55581-236-8 3. Zoonoses, Martin Shakespeare, Pharmaceutical Press, 2002, ISBN 085369480 X 4. Modern Food Microbiology, J.M. Jay, M.J. Loessner, D.A. Golden, Springer, 2005 ISBN 0-387-23180-3 5. Μικροβιολογία Τροφίμων, Γ. Μπαλατσούρας, Εκδόσεις Έμβρυο, 2006, ISBN 960-80002-25-7 6. Food-Borne Microbes – Shaping the host ecosystem, L.-A. Jaykus, H.H. Wang, L.S. Schlesinger, ASM Press, 2009, ISBN 978-1-55581-405-2
Assessment	Final exam: 55% Midterm exam: 20% Group assignment and presentation: 10% Individual assignment: 15% The examination papers include multiple choice questions, short essay questions and critical thinking questions
Language	Greek

Course Title	**Plant Pathology**				
Course Code	ABF 310				
Course Type	Theory and Labs				
Level	Undergraduate				
Year / Semester	Fall Semester/5th Semester/3rd year				
Teacher's Name	Dr. Loukas Kanetis/Dr. Iakovos Pantelides				
ECTS	6	Lectures/week	2 x 1.5 hours	Laboratories/week	1x2 hours
Course Purpose and Objectives	The course aims to provide students with an understanding of the basic concepts and importance of Phytopathology. In particular, the course aims to familiarize students, in theory and practice, with plant diseases, their causal agents, their biology, their interaction with plants and the basic principles of plant disease management.				
Learning Outcomes	Upon successful completion of the course, students will understand the meaning and importance of science of Phytopathology and the importance of plant diseases. Students will gain a strong background in Phytopathology through training on several issues e.g. the expression of the disease (symptoms and signs), the main causal agents of plant diseases (fungi, bacteria, viruses, non-parasitic agents, adverse conditions of the environment, transport, storage and reproduction), aspects regarding the epidemiology of plant diseases and basic principles of plant disease management. The basic concepts of Phytopathology are analyzed to the extent required so that students can understand concepts and definitions on several topics of Phytopathology and acquire the necessary knowledge and skills to attend the course ABF318 "Diseases of Crop Plants" of the following semester.				
Prerequisites	NA		Required		NA

Course Content	**LECTURES**
	• Introduction to Phytopathology: Purpose, significance, history
	• Symptoms of plant diseases
	• Signs of phytopathogenic microorganisms
	• Basic knowledge of phytopathological mycology
	  • Morphology of Fungi and Oomycetes
	  • Reproduction of Fungi and Oomycetes
	  • Classification of Fungi and Oomycetes
	  • The most important Fungal and Oomycetous genera and species
	• Basic knowledge of phytopathological bacteriology
	  • Morphology, survival, dispersion and bacterial replication
	  • Classification of bacteria
	  • The most important phytopathogenic bacterial genera and species
	  • Bacterial infection and pathogenesis
	• Basic knowledge of phytoplasmas and spiroplasmas
	• Basic knowledge of phytopathological virology
	  • Virus morphology, virus reproduction and classification
	  • Infection and multiplication of viruses in host cells
	  • The most important phytopathogenic viruses
	  • Movement of viruses into plant cells
	  • Transmission of plant viruses
	  • Basic knowledge about plant viroids
	• Parasitic plants
	• Non-parasitic diseases
	  • Extreme environmental conditions
	  • Nutrient deficiencies
	  • Toxicities
	  • Atmospheric pollutants				

	• Mechanisms of pathogenesis
	  • Passive defense mechanisms
	  • Induced defense mechanisms
	  • Hypersensitive response
	  • Induced Systemic Resistance and Systemic Acquired Resistance
	  • Immune system of plants
	  • Pathogen-host recognition mechanisms
	• Epidemiology of plant diseases
	  • The disease pyramid (disease tetrahedron)
	  • Monocyclic and polycyclic diseases
	  • Principles and methods of plant disease control
	
	LAB PRACTICALS
	• Stereoscopic and microscopic observation of mycelial structures (hyphae, septa, sclerotia, rhizomorphs, mycelial plaques), asexual and sexual organs of reproduction of fungal pathogens (Oomycetes, Ascomycetes, Basidiomycetes).
	• Recognition of symptoms and signs of significant fungal and bacterial plant pathogens.
	• Observation and processing of fresh samples from plants with fungal, bacteriological, virus and non-parasitic diseases.
	• Fungal genetics: Reproduction of fungi and genetic recombination.
	• Fungal genetics: Calculating genetic distance based on the frequency of genetic recombination.
	• Infection and pathogenicity of *Agrobacterium tumefaciens*.

Teaching Methodology	• Lectures and laboratory practicals • Computer based presentations (PowerPoint) and support of the learning process through moodle. • Active participation in learning activities, discussion and resolving questions • Educational field trips or visits in open-field crops or/and crops grown under protection • Individual meetings for guidance and problem solving • Independent study using the provided literature
Bibliography	**1.** Teacher's Course Presentations (in Greek). **2.** Φυτοπαθολογία, Ελευθέριος Τζάμος, Εκδόσεις Σταμούλης, 2η Έκδοση 2007, ISBN: 978-960-351-725-2 (in Greek). **3.** Φυτοπαθολογία, Επιμέλεια Νικόλαος Κατής, Utopia Publishing 2016, ISBN: 978-618-81298-8-7 (in Greek). **4.** Plant Pathology, George N. Agrios, 5th Edition, SB 731A35 2005, ISBN: 0-12-044565-4. **5.** Ιολογία Φυτών, Νικόλαος Κατής, 2ήΈκδοση, Θεσσαλονίκη 2000, ISBN: 960-317-056-9 (in Greek).
Assessment	Mid-term Examination: 25% Final Examination: 55% Laboratory Examination: 20% Tests include close-ended questions (multiple choice, fill-in, matching, etc.), short answer and full essay questions. The test contains knowledge questions and questions that the student needs to combine knowledge gained from the course. Laboratory evaluation includes the identification of phytopathogenic microorganisms and a final written examination. A proper laboratory notebook containing records and notes for the lab experiments/exercises is a prerequisite for participation in the final examination of the laboratory.
Language	Greek (English terminology is provided for all common terms of Phytopathology)

Course Title	**Food Biotechnology**				
Course Code	ABF 351				
Course Type	Theory and Laboratory practicals				
Level	Undergraduate				
Year / Semester	Autumn Semester/5th Semester/3rd year				
Teacher's Name	Dr. Dimitris Tsaltas				
ECTS	5	Lectures / week	2 x 1.5hr	Laboratories / week	2h x 1 group
Course Purpose and Objectives	The course aims to present the concepts and technologies in the field of biotechnology, with particular reference to the applications of microorganisms and enzymes in food technology. To gain a theoretical background on the microorganisms involved and their behavior in fermentation as well as in enzymology and its applications in food technology.				
Learning Outcomes	Upon successful completion of the course students will understand the concepts of Food Biotechnology and will be able to describe the main foods resulting from fermentation, as well as the action of microorganisms responsible for fermentation in foods, as well as identify key food modifiers. Students will be able to analyze the biochemical processes of producing microbial protein, microbial oils and alcohol as well as describe the applications of enzymes in the Food Industry and more specifically the enzymatic technology in the production of wine and spirits. Students are also expected to be able to perform enzymatic analyzes of food.				
Prerequisites	none	Required	none		
Course Content	Theory 1. Introduction - What is biotechnology 2. Tools of modern biotechnology 3. Fermentation and Bioreactors 4. Biotechnological processes - Biotransformation 5. Bacterial Genetic Engineering for Food Technology Needs 6. Production of amino acids 7. Production of polysaccharides 8. Production of pectinases 9. Production of citric acid 10. Microalgae and cyanobacteria 11. Ethics, safety and regulations in biotechnology 12. Enzymology and enzyme technology 13. Biochemistry and microbial protein production technology 14. Biochemistry and microbial oil production technology 15. Biochemistry and alcohol production technology **Laboratory exercises:** 1. Safety rules and familiarization with laboratory equipment. 2. Bread fermentation and factors that influence fermentation. 3. Enzymatic juice extraction using pectinases. 4. Relative rate of alcoholic fermentation by measuring the loss of carbon dioxide (CO_2). 5. Construction of diagram (CO_2 loss vs time) and calculation of fermentation rate. 6. Sugar metabolism in different *Saccharomyces* strains. 7. Fermentation at different alcohol levels, temperatures and pH. 8. Test grocery store food products for the presence of genetically modified organisms (GMO) by PCR. 9. Electrophoresis of DNA fragments. 10. Immunological assay ELISA (Enzyme-Linked Immunosorbent Assay). 11. Detection of ochratoxin A in wine samples by HPLC. 12. HPLC results analysis and quantification of Ochratoxin A. 13. Presentation of experimental results and evaluation of reports.				

Teaching Methodology	Lectures Laboratory practicals Active lifelong participation in learning activities, discussion and querying Teamwork in laboratory practicals Individual meetings for guidance and querying Independent study/assignment using bibliography and reliable web sites available online
Bibliography	(1) Βιοτεχνολογία (2000). Δ. Α. Κυριακίδη, Εκδόσεις Ζήτη, ISBN: 960-431-595-1 , www.ziti.gr Library Ref # (2) Introduction to food biotechnology (2002). Perry Johnson-Green, CRC Press, ISBN: 0-8493-1152-7, www.crcpress.com , Library Ref # TP248.65 F66 J64 2002 (3) Biotechnology for beginners (2008). Reinhard Rennebergt, Academic Press, ISBN: 978-0-12-373581-2, www.books.elsevier.com , Library Ref # TP248.2 R45 2008 (4) Introduction to biotechnology (2009). W.J. Thieman, M.A. Palladino, Pearson – Benjamin Cummings, ISBN: 9780321589033, www.pearsonhighered.com , Library Ref # TP248.2 T49 2009 (5) Food Biotechnology (2006). K. Shetty, G. Paliyath, A. Pometto, R.E. Levin, CRC Press, ISBN: 978-0-824-753-290, www.crcpress.com , Library Ref # TP248.65 F66 F66 2006 Scientific journals: Food Biotechnology https://www.tandfonline.com/toc/lfbt20/current?nav=tocList Applied Microbiology and Biotechnology https://link.springer.com/journal/volumesAndIssues/253 Food Technology and Biotechnology http://www.ftb.com.hr/
Assessment	Laboratory Exam 30%, Assignment 20% και Final Exam 50%
Language	Greek

Course Title	**Crop Science**				
Course Code	ABF 218				
Course Type	Theory and Laboratory				
Level	Undergraduate				
Year / Semester	2nd year/4th Semester-Spring				
Teacher's Name	Dr. Nikolaos Nikoloudakis				
ECTS	5	Lectures / week	2x1.5hrs	Laboratories / week	1.5hrsX1 groups
Course Purpose and Objectives	The objectives of the current course is to develop the comprehension and skills that derived via the principles and concepts of crop science. Furthermore, students are prepared for the implementation of basic knowledge and applied subjects, the participation in an interdisciplinary environment and the promotion of a composite and apagogical thinking				
Learning Outcomes	After the fulfillment of the subject, students are expected to: 1. Recognize the most important crops (winter-summer). 2. Describe the morphology and function of crops (small grains-legumes) 3. Define the different cultivating techniques applied according to plant types				
Prerequisites	None	Required	None		
Course Content	1. Introduction 2. Small Grains • Barley • Wheat (durum– Common) • Oats • Secale • Triticale 3. Legumes • Nitrogen fixation • Composition and nutrient value • vetch/ Peas/ broad beans • Peanut / Beans / Cowpea / chickpea • alfalfa / Trifolium 4. Industrial plants – energy crops. Cotton/ Tobacco/ sugar beets / Sunflower / Rapeseed				
Teaching Methodology	Power Point presentations Active participation in learning activities, conversation, and questions Laboratory exercises Educational excursion Assignment				
Bibliography	1. Presentation Notes 2. Crop Science for the temperate regions. Andreas I Karamanos, Papazisi publishing group Athens 2008. ISBN 978-960-02-2208-1, SB189.K373 2008 3. Legumes (Pulses–forages). Despoina Papacosta–Iasopoulou, Publishing group: Modern Education, Thessaloniki 2005. ISBN 960- 357-067-2 4. Principles of Field Crop Production. 4 th Edition. John H. Martin, Richard P. Waldren, David L. Stamp. 2006. ISBN 0-13-025967-5 SB187.U6 M3 2006 5. Principles of crop production : theory, techniques and technology / George Acquaah SB185 .A27 2005				
Assessment	Students will be assessed using a multifactorial system: Final examination: 60% Midterm examination: 20% Laboratory examination: 15% Assignment:5% Examination tests include closed type questions (multiple choice, gap-fill, matching etc), open-ended questions, composite questions, and problem solving questions that critically evaluate the accomplishment of the aforementioned results.				
Language	Greek (English terminology is provided for the common used agricultural terms)				

Course Title	**Food Packaging**				
Course Code	ABF 250				
Course Type	Theory				
Level	Undergraduate				
Year / Semester	Spring Semester/4th Semester/2rd year				
Teacher's Name	Dr. Vlasios Goulas				
ECTS	5	Lectures / week	2 x 1.5hr	Laboratories / week	
Course Purpose and Objectives	The aim of the course is the students to understand the basic principles of food packaging and correlate the packaging with food safety and quality as well as with the shelf-life of foods. The course also aims to introduce students to the food packaging materials highlighting the manufacture, properties and applications of each material. Furthermore, the familiarization of students with food packaging systems as aseptic, active, intelligent, MAP and edible packaging is additional objective of the course. Finally, the students will become acquainted with the packaging of different types of foods eg horticultural products, meat and seafood products, dairy products, beverages, cereals, snack foods and confectionary.				
Learning Outcomes	After successfully completing this course, students will be able to: • Understand the multifunctional role of food packaging • Be able to choose the appropriate type of packaging and material • Recognise and compare packaging materials to pinpoint advantages and disadvantages • Apply the basic principles of aseptic and MAP packaging • Understand the use of active and intelligent packaging and the basic principles and main applications of edible packaging • Determine the shelf life of packaged foods				
Prerequisites	No	Required	No		
Course Content	**Theory** • Introduction to Food Packaging and its multifunctional role • Plastic polymers: introduction and types of packaging for each food • Plastic polymers: manufacture of plastics packaging, optical, mechanic and barrier properties • Metal packaging materials: introduction, manufacture and corrosion • Metal packaging materials: types and applications • Paper packaging materials: introduction and manufacture • Paper packaging materials: types and applications • Glass packaging material: introduction, manufacture and applications • Food and packaging interactions • Aseptic packaging • Modified atmosphere packaging • Active and intelligent packaging • Edible packaging materials • Food packaging and shelf life • Packaging of horticultural products • Packaging of meat, poultry and seafood products • Packaging of dairy products • Packaging of beverages • Packaging of cereals, snack foods and confectionary				
Teaching Methodology	Lectures Group class presentations (selected topics/ scientific papers) Autonomous study				
Bibliography	(1) Power point presentations (2) Συσκευασία Τροφίμων. 2004. Μπλούκας Ιωαννης, Εκδόσεις Σταμούλη. ISBN: 9603515086 (3) Συσκευασία Τροφίμων. 2010. Παπαδάκης Σπυρίδων. Εκδόσεις Τζιόλας. ISBN:				

	9789604182268. (4) Food packaging: principles and practice. 2012. Gordon L. Robertson. CRC Press (3rd ed.) ISBN: 9781439862414.
Assessment	Final examination: 60% Intermediate examination: 30% Presentation of coursework (group of 2 students): 10% Written exams of increasing difficulty, which may include multiple choice test, questions of brief answer, questions to develop a topic and judgment questions.
Language	Greek

Course Title	**Enology**				
Course Code	ABF 350				
Course Type	Theory and Labs				
Level	Undergraduate				
Year / Semester	Spring Semester/6th Semester/3rd year				
Teacher's Name	Dr. Vlasios Goulas				
ECTS	5	Lectures / week	2 x 1.5hr	Laboratories / week	1 x 2 h
Course Purpose and Objectives	The course aims at providing the principles of enology such as the grape physiology, composition and maturation, pre-fermentation treatments, the common winemaking techniques, post-fermentation treatments, oxidative and reductive aging and sensory evaluation of wine. The course also gives special attention on the wine chemical composition and microorganisms and their contribution to the wine quality. The purpose of practical is the student to familiarize themselves with the common chemical analysis to control the winemaking process and to assess the quality of wine.				
Learning Outcomes	After successfully completing this course, students is expected to be able to: • correlate the grape components with their importance for winemaking and apply the pre-fermentation treatments in must • Understand the basic principles of winemaking (white, rose, red, sweet, medium sweet and sparkling wines) and the most important points to produce each type of wine • Discern the impact of malolactic fermentation and its impacts on wine and distinguish the main wine organoleptic defects and make decisions for the improvement • Understand the importance of oxidative and reductive aging in wine production and connect the chemical composition of wine and correlate compounds with wine organoleptic characteristics • Define the role of microorganisms in winemaking • Perform chemical analysis to assess wine quality and winemaking process				
Prerequisites	No	Required	No		
Course Content	**Theory** • Introduction to Wine World • Viticulture and enology in Cyprus • Grape physiology and composition • Grape maturity • Harvest and pre-fermentation treatments • White winemaking • Red winemaking • Rose wines: winemaking guidelines • Sweet wines: winemaking guidelines • Sparkling wines: winemaking guidelines • Wine composition: volatiles, sugars, organic acids, nitrogen and sulfur compounds, polyphenols • Wine yeasts and the biochemistry of alcoholic fermentation • Lactic bacteria and malolactic fermentation in wines • Acetic acid bacteria in winemaking • Stabilization and treatments in wines • Aging of wines • The use of sulfur dioxide in must and wine • Wine tasting basics **LAbs** • Determination soluble solid content in must by refractory and hydrometry				

	• Determination of titratable acidity and pH in wines • Determination alcoholic strength in wines • Determination of free and total sulfur dioxide in wines • Determination reducing sugars in wines • Determination of carbon dioxide in sparkling wines by titration • Detecting malic and lactic acids in wines by thin layer chromatography (TLC) • Measurement of wine colour • Determination total phenolic content and poly phenolic index in red wines • Determination of ascorbic acid in wines • Protein and tartaric acid stability assays
Teaching Methodology	Lectures Practical laboratory courses Group class presentations (selected topics/ scientific papers) Autonomous study
Bibliography	(1) Power point presentations. (2) Οινολογία: από το σταφύλι στο κρασί. 2008. Τσακίρης Αργύρης, Εκδόσεις Ψύχαλος. ISBN: 9789607920058 (3) Οινολογία: επιστήμη και τεχνογνωσία. 2000. Σουφλερός Ευάγγελος. Εκδόσεις Σουφλερός Ευάγγελος. ISBN: 960969908. (4) Handbook of enology. 2006. Ribereau-Gayon, P., Glories, Y., Maujean, A., Dubourdieu. John Wiley & Sons Ltd. ISBN: 9780470010341
Assessment	Final examination: 50% Intermediate examination:25% Laboratory examination: 15% Presentation of coursework (group of 2 students): 10% Written exams of increasing difficulty, which may include multiple choice test, questions of brief answer, questions to develop a topic, judgment questions and solving problems.
Language	Greek

Course Title	**Dairy Science & Technology**				
Course Code	ABF 353				
Course Type	Theory and Practical Classes				
Level	Undergraduate				
Year / Semester	Spring Semester/6th Semester/3rd year				
Teacher's Name	Dr Photis Papademas				
ECTS	5	Lectures / week	2 x 1.5hr	Laboratories / week	1x2hr
Course Purpose and Objectives	The course objective is for students to acquire the knowledge and the skills (though practical classes) in order to apply the principles of dairy science and technology in order to manufacture dairy products (i.e. yoghurt, pasteurized milk) and be able to apply necessary quality control procedures in the dairy industry. The course aims in familiarize students to cheese making technology and procedures so they can apply their knowledge in small and large scale dairy industries. Additionally, the course will provide students with the necessary scientific background that is needed in order to advance to MSc courses.				
Learning Outcomes	Student will be able to fully describe the milk's components-and their functionality, the properties of milk (physico-chemical), the microbiology of raw milk and distinguish between milk species (i.e. cow, goat, sheep). Student will be in a position that they can describe and fully comprehend the basic milk processing procedures and their effect on the nutritional/sensorial/quality characteristics of dairy products. They should also be able to describe the manufacturing procedure of major dairy products. Students will be able at the end of the course to fully understand the importance of food safety measures that one must take in a dairy industry in order to produce safe products avoiding cross-contamination. The Food Safety Management Systems and their application in the dairy industry must also be fully comprehended by students. Additionally, students will identify the basic specifications for a hygienic design of a dairy factory, as well as the minimum requirements for the dairy equipment to be used.				
Prerequisites	ABF 150 Introduction to Food Science and Technology	Required	None		
Course Content	**<u>Lectures</u>** • Introduction to Dairy Science o The Dairy industry and its importance in Cyprus, the EU and worldwide o Statistical Data • Milk as a Raw Material – Quality/Safety o Biosynthesis o Physical Properties (pH/Acidity) o Chemical Composition • Fat (Fatty acids), Protein, Lactose, Total Solids, o Microbiology • Pathogens, Spoilage, Lactic acid bacteria o Mastitis-Antibiotics o Raw milk quality control • Milk processing o Centrifugation/ Fat separation o Homogenisation o Thermal processing • Pasteurisation • Ultra-High Temperature o Microfiltration o UV Treatment o Spray Drying o Freeze Drying • Dairy Products – Technology o Fluid Products – Pasteurised milk				

	○ Fermented dairy products ενα Προϊόντα Γάλακτος • Yoghurt • Kefir • Airani • Milk products with added probotics/prebiotics ○ Ice cream, Milk Cream, Butter ○ Milk Powder, Whey powder • Sensory Analysis of Dairy products • Hygienic Dairy Factory Design • Food Safety/Quality Management in the Dairy Industry ○ Hazards in the Dairy Industry ○ Critical control Points ○ Traceability **LABORATORY** • Chemical composition –IR analysis • Determination of nitrogen fractions -Kjeldhal • Fat Determination • Detection of Aflatoxin M1 (ELISA) Ανίχνευση Αφλατοξίνης M1 • Detection of Milk Adulteration (species of milk) – ELISA • Antibiotic detection • Milk homogenization • Set yoghurt production • Kefir production • Sensory Evaluation
Teaching Methodology	Lectures Classroom discussions/group work, problem-solving exercises Autonomous Learning Group work Laboratory practical
Bibliography	(1) Γαλακτοκομία. Καμιναρίδης Στέλιος, Μοάτσου Γκόλφω, Εκδότης: Έμβρυο, 2009 (2) Γάλα-Επιστήμη, Τεχνολογία και Έλεγχοι για τη Διασφάλιση της Ποιότητας. Χρ.Κεχαγιάς, Εκδόσεις 'Ιων, Αθήνα 2011 (3) Υγιεινή και τεχνολογία του γάλακτος και των προϊόντων του. Αντώνης Μάντης, Εκδόσεις: Κυριακίδη Αφοί, 2000 (4) Τεχνολογία Προϊόντων Γάλακτος (Ζυμούμενα Προϊόντα, Παγωτό, Κρέμα, Βούτυρο). Γ. Ζερφυρίδης Εκδόσεις Γιαχούδης Ο.Ε Θεσ/νίκη, 2001
Assessment	○ Mid-Term Exam 20% ○ Final Exam 60% Exams include close-type questions (multiple choice, fill in the gaps, matching), short answers, essay-type answers, problem-solving questions, short case-studies. ○ Laboratory reports + Laboratory Examination 10+10% = 20 %
Language	Greek (English terminology for the basic terms used in Dairy Science and Technology are provided)

Course Title	**Food Safety and Hygiene**				
Course Code	ABF 356				
Course Type	Theory and Labs				
Level	Undergraduate				
Year / Semester	Spring Semester/4th Semester/2rd year				
Teacher's Name	Dr Photis Papademas				
ECTS	5	Lectures / week	2 x 1.5hr	Laboratories / week	
Course Purpose and Objectives	The course's objective is for students to acquire the necessary skills and knowledge in order to apply the necessary food safety and hygiene procedures throughout the food chain so to produce foodstuff that are safe for human consumption. Another objective is for students to be able to work in the relevant Food Safety Department of an industry and also to gain the needed scientific background in case that one should opt for further/advances studies in Food safety/hygiene management systems.				
Learning Outcomes	Students will be able to identify potential hazards (microbiological, chemical, physical) in the food / food chain and to control them (or test for them) identify the potential hazards in basic food processing steps. Students will be aware of all relevant both general and specific legislation for European food safety to handle a food crisis (i.e. food poisoning). Students are expected to be able to put into action measures relevant to Good Hygiene Practices (GHP, personnel lebel) and the Good Manufacturing Practice (GMP-equipment, factory design) Students will be able to define all prerequisites essential for applying any Food Safety System in the industry. Finally students are expected to describe the available Food Safety Systems (commercial) and HACCP system (applied by Law).				
Prerequisites	ABF 150- Introduction of Food Science and Technology	Required	None		

Course Content	**<u>Lectures</u>**
	• Introduction to Food Safety and Hygiene – Terminology/Vocabulary
	• EU Legislation for Food Safety and Hygiene
	  o Rapid Alert System for Food and Feed, RASFF
	• Food Microbiology
	  o Legislation
	  o Pathogens
	  o Spoilage bacteria
	• Food poisoning/Food-borne diseases
	  o Examples / Case Studies
	  ▪ Catering business, Hotel Industry, Food Industry
	• Chemical Hazards
	  o Legislation
	  o Naturally occurring
	  o As result of processing (i.e. acrylamide)
	  o Food Additives (i.e. nitrates-maximum EU levels)
	• Other hazards
	  o Physical
	  o Allergens
	• Designing/Construction of Food Premises – Good Manufacturing Practice – Prerequisite
	  o Importance of the hygienic design in applying Food Safety/Hygiene practices
	• Personal Hygiene- Good Hygiene Practice - Prerequisite
	  o Importance of personnel training in applying Food Safety/Hygiene				

	practices • Food Production o Buying Raw Materials -Specs o Receiving Raw Materials o Correct Storage and Temperature control o Food Processing o Cross-Contamination o Food Preservation and avoiding spoilage • Other Prerequisites o Cleaning and Disinfection o Pest Control o Calibration • Food Safety Standards – International/EU o HACCP / ISO 22000 / FSSC 22000/ BRC / IFS
Teaching Methodology	Lectures Classroom discussions Group work Problem-solving exercises / case studies Autonomous Learning
Bibliography	(1) Δ. Καλογρίδου-Βασιλειάδου - Κανόνες Ορθής Υγιεινής Πρακτικής για τις Επιχειρήσεις Τροφίμων, 1999, University Studio Press (2) Richard A. Sprenger, Hygiene for Management – A text for food safety courses, 10th edition 2003, Highfield.co.uk, ISBN 1-904544-12-6 (3) S.J Forsythe and P.R. Hayes, Food Hygiene, Microbiology and HACCP 3rd edition, 2000, Aspen Publication, ISBN 0-8342-1815-1
Assessment	Mid -Term 30% Final 60% • Exams include close-type questions (multiple choice, fill in the gaps, matching), short answers, essay-type answers, problem-solving questions, short case-studies.παραπάνω. Εργασία 10% • This project involves a class visit to a food industry/factory and carrying out an audit of the food safety management procedures. An audit report with comments must be produced to be marked.
Language	Greek (Terminology/Vocabulary regarding Food Quality is provided in English)

Course Title	**Postharvest physiology and technology**				
Course Code	ABF415				
Course Type	Theory and Labs				
Level	Undergraduate				
Year / Semester	Spring Semester/7th Semester/4th year				
Teacher's Name	Dr. George Manganaris (Lectures and Laboratories), Assistant Staff (Laboratories)				
ECTS	5	Lectures / week	2 h	Laboratories / week	4 h (2 groups x 2 h)
Course Purpose and Objectives	The course purpose is to render the students of two Directions ('Plant Science' and 'Food Science') familiar with the main aspects of postharvest physiology and technology of horticultural commodities. In particular, learning outcomes of this course are the students to understand and acquire knowledge regarding: (1) quality aspects of horticultural products, factors affecting postharvest life of horticultural products, (3) maturity indices, (4) ethylene and its inhibitors/antagonists, (5) preharvest factors affecting postharvest life of horticultural products, (6) preparation of horticultural products for the market, (7) precooling and Cooling systems, (8) advanced storage protocols (Modified/Controlled Atmosphere storage/Dynamic Controlled Atmosphere), (9), modified atmosphere packaging, (10) transportation of horticultural products, (11) physiological disorders due to abiotic stress conditions and (12) postharvest losses due to biotic factors.				
Learning Outcomes	Upon completion of the course, the student is expected to be familiar with the main concepts of postharvest physiology and technology, as indicated in the learning outcomes and course content. The aforementioned objectives will be fulfilled through acquired knowledge in the specific topics: - Knowledge on fruit physiology during developmental stages, at harvest and during postharvest ripening - Ability to synthesize and provide solutions and recommendations of postharvest technologies based on the commodity considered - Knowledge on commercially applicable storage solutions of horticultural commodities, its capital and function cost - Broadening knowledge in state-of-the-art postharvest technologies for storage at room facilities ort during transportation to distant markets In addition, the student is expected to acquire the following general abilities: 1. Practice critical judgment 2. Data and information searching, analysis and synthesis 3. Use of up-to-date bibliographic references and ability to solve practical issues dealing with aspects of postharvest technology 4. Autonomous work 5. Team work 6. Development of written and oral communication skills				
Prerequisites	ABF 211: Plant Physiology			Required	-
Course Content	**I. Theoretical part** - Quality of horticultural products - Factors affecting postharvest life of horticultural products - Maturity indices - Ethylene and its inhibitors/antagonists (1-methylycyclopropene, AVG) - Preharvest factors affecting postharvest life of horticultural products - Preparation of horticultural products for the market - Heat treatments and examples of delayed storage - Precooling systems (hydrocooling, force-air cooling, vacuum cooling) - Cooling systems - Modified/Controlled Atmosphere storage/Dynamic Controlled Atmosphere - Advanced packaging solutions (Modified Atmosphere Packaging) - Transportation of horticultural products				

	- Physiological disorders - Postharvest losses **II. Lab exercises** - Sources of information about postharvest physiology & technology - Introductory note Maturity indices (physical, chemical, physiological characteristics) - Determination of tissue firmness with an array of destructive and non-destructive assays - Determination of soluble solids content, titratable acidity, ripening index - Chroma determination - Determination of dry matter content as maturity indices (kiwifruit, avocado) - Ethylene evolution and respiration rate - Sensory evaluation - Analysis of cell wall components - Experiment of storage potential of fresh product [team work (experiment and data presentation)]
Teaching Methodology	- Lectures in class (face to face) - Laboratory exercises (face to face) - Team and autonomous work - Case studies and problem solving - Upload of teaching modules in Moodle, including key bibliographic references for additional reading - Educational site visits in packing houses and distribution centers of fresh produce - Written exercises - Work at home and oral presentation of data derived from team experiment
Bibliography	1. Βασιλακάκης Μ. 2006. Μετασυλλεκτική Φυσιολογία, Μεταχείριση Οπωροκηπευτικών και Τεχνολογία. Διαιτητική Αξία Οπωροκηπευτικών. ISBN:9608870682, pp. 586. 2. Σφακιωτάκης Ε. 1995. Μετασυλλεκτική φυσιολογία και τεχνολογία νωπών οπωροκηπευτικών προϊόντων. Εκδόσεις TypoMan. Θεσσαλονίκη, pp. 381. 3. De Freitas Tornetto S, ParEek S. 2019. Postharvest physiological disorders in fruits and vegetables. CRC Press. 9781138035508, pp. 823. 4. Florkowski WJ, Prussia SE, Shewfelt RL, Brueckner B. 2009. Postharvest Handling - A Systems Approach. Academic Press, ISBN:9780123741127, pp. 640. 5. Kader A. 2002. Postharvest Technology of Horticultural Crops. University of California, Agriculture and Natural Resources. Publication 3311. ISBN:1879906511, pp. 536. 6. Nath P, Bouzayen M, Mattoo A, Pech JC. 2014. Fruit ripening: Physiology, Signalling and Genomics. ISBN:9781845939625, pp. 336. 7. Siddiq M, Ahmed J, Lobo MG, Ozadali F. 2012. Tropical and Subtropical Fruits: Postharvest Physiology, Processing and Packaging. ISBN: 9780813811420, pp. 648. 8. Thompson AK. 2010. Controlled atmosphere storage of fruits and vegetables. CABI, ISBN:9781845936464, pp. 272.
Assessment	Written exams in theory (60%) with short answers and multiple choice questions and laboratory (25%) with written exams and exercises. Student's total performance is assessed by the compensation of both grades on Theory and Laboratory modules. Additional evaluation (15%) is retrieved from homework assigned to students and presentation.
Language	Greek (terminology for specific terms are provided in English)

<table>
<tr><td>Course Outline</td><td colspan="5">Enlgish For Academic Purposes</td></tr>
<tr><td>Course Code</td><td colspan="5">LCE 101</td></tr>
<tr><td>Course Type</td><td colspan="5">Theoretical, Compulsory</td></tr>
<tr><td>CEFR Level</td><td colspan="5">Undergraduate
B1-B2</td></tr>
<tr><td>Academic Year / Semester</td><td colspan="5">1st Year/ 1st Semester
Fall 2018</td></tr>
<tr><td>ECTS</td><td>4</td><td>Lectures / week</td><td>2x1.5h</td><td>Laboratories / week</td><td>NONE</td></tr>
<tr><td>Instructor’s Name</td><td colspan="5">ELIS KAKOULLI COSTANTINOU</td></tr>
<tr><td>Course Aims</td><td colspan="5">The general objective of this three-hour per week, 4-ECTS credit (European Credits Transfer and Accumulation System) required degree level course is to enable students to communicate competently at a B1-B2 level of the Common European Framework of Reference (CEFR) for Languages on issues related to students’ social and academic life (university, curriculum, field of study), as well as on issues related to their future professional careers (occupations, EU Common Agricultural Policy, product description, etc.). Computer Assisted Language Learning (CALL) and culture learning are done through communicative situations deriving from authentic-like communication situations students may experience in their lives during their studies and professional careers. Language competence is acquired through the use of text types, scenarios, and roles which promote the production and understanding of spoken and written language related to the topics covered.
The course is based on current learning theories, such as constructivism and social constructivism and on student-centered teaching methods. It develops both language as well as transferable 21st century skills, such as communication, use of new information and communication technologies (ICT), collaboration, creativity, innovation, critical thinking, intercultural awareness as well as autonomy and lifelong learning.
In relation to Agricultural Sciences, Biotechnology and Food Science, this course particularly aims at developing students’ ability to understand lectures and seminars, which are delivered by guest speakers in their Department or webinar or video speakers. The course also aims at developing students’ writing and speaking skills on topics related to the field of their studies and their competence in the management of bibliography in English.</td></tr>
<tr><td>Learning Outcomes</td><td colspan="5">After the completion of the course students are expected to:
Understand and use lexis and concepts as well as grammatical and syntactical structures related to the field of Agricultural Sciences, Biotechnology and Food Science in the four (4) basic language skills: Listening, Speaking, Reading, and Writing.
Comprehend and produce spoken English texts related to the students’ social, academic and future professional life (e.g. university, field of study, workplace, potential professions, duties, etc.)
Comprehend written English texts (e.g. extracts from academic books, academic articles, notes, etc.) and produce written texts (e.g. emails, summary, notes, articles, short reports, reference lists, etc.) related to their field of studies and their professions.
Have developed sufficient academic research skills with the aim of fulfilling their respective obligations in the Agricultural Sciences, Biotechnology and Food Science curriculum.
Have developed 21st century skills such as communication, use of technology, collaboration, creativity and innovation, critical thinking, intercultural awareness and skills which promote autonomous and lifelong learning.</td></tr>
</table>

Prerequisites	None	Co-requisites	None
Course Content	• Course delivery technologies • My University Student Profile • Styles of Learning • Professions in the fields of Agricultural Sciences, Biotechnology &Food Science • The history of agriculture • Agriculture in Cyprus • The Common Agricultural Policy • Plant Products • Animal Products • Soil • Water • Seeds • Plant growth • Compiling an academic essay/ article (Paraphrasing and Summarising, Avoiding Plagiarism, Citing sources, Compiling a Reference List) • Biotechnology • Mitosis • Genetic Engineering • Feed and Nutrients • Storage • Housing Animals • Breeding		
Teaching Methods	A blend of teaching methods and tools is used: • Interactive lectures • Class discussions and dialogic engagement in online discussion forums • Individual, group or collaborative understanding and creation of oral and written text types, which are authentic, and serve specific communicative purposes. • Active participation in various interactive learning activities assisted by ICT (Information and Communication technology) • Autonomous study		
Bibliographical References	Coursebook: O'Sullivan, N. & Libbin, J. D. (2011). *Agriculture.* Express Publishing. EU. Supplementary material: Hartmann, P. (2007) *Quest 2: Reading and Writing.* McGraw Hill. Creme, P. and Lea, M.R. (2008) *Writing at university: A guide for students.* Open University Press. Soles, D. (2005) *The essentials of academic writing.* Houghton Mifflin Co. Jordan, R. R. (1999) *Academic writing course: study skills in English.* Longman. Printed Dictionaries: ▪ Longman Dictionary of Contemporary English. Pearson Longman. ▪ Cambridge's Advanced Learner's Dictionary. Cambridge University Press. ▪ Concise Oxford English Dictionary. Oxford University Press. ▪ Χριστοδουλάκης, Δ. Κ. & Ψαράς, Γ. Κ. (2001). *Λεξικό Βοτανικών Όρων*. Πάτρα: ▪ Εκδόσεις Πανεπιστημίου Πατρών. (Index with English terms) ▪ Μπόσκου, Δ. Γ. (1998). English-Greek Dictionary of Food Science and Technology. Γαρταγάνης. ▪ Στρουθόπουλος, Θ. (2006). Γεωπονικό λεξικό : ερμηνεία και απόδοση όρων στα ελληνικά, αγγλικά, γαλλικά & γερμανικά. Online Dictionaries: ▪ Cambridge dictionaries online: http://dictionary.cambridge.org/		

	▪ The free online dictionary with sound: http://www.thefreedictionary.com/ ▪ Greek-English, English-Greek online dictionary: http://www.in.gr/dictionary/ ▪ Dictionary.com: http://dictionary.reference.com/ ▪ Merriam-Webster online dictionary: http://www.merriam-webster.com/home.htm ▪ English Pronouncing Dictionary with Instant Sound http://www.howjsay.com/
Assessment	• Classwork 15% • Homework 15% • Midterm Examination 30% • Final examination 40%
Language	English