



**TECHNOLOGY AND QUALITY
CONTROL OF FERMENT
FOOD
COURSE OUTLINE**

GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
DEPARTMENT	FOOD SCIENCE AND NUTRITION		
COURSE LEVEL	Undergraduate		
COURSE CODE	ME812	SEMESTER	8 th
COURSE TITLE	TECHNOLOGY AND QUALITY CONTROL OF FERMENT FOOD RESPONSIBLE: I. GIAVASIS		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	ECTS
Lectures		3	6
Lab Lectures-exercises		3	
COURSE TYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area		
PREREQUISITES:			
LANGUAGE OF TEACHING AND EXAMINATIONS:	GREEK		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES		
URL	https://food.uth.gr/		

TEACHING RESULTS

Teaching Results
The course describes the categories and types of fermented foods, cultures starter and the species of indigenous microorganisms involved in food fermentations, and analyzes the way microorganisms and fermentation conditions affect the quality and organoleptic characteristics but also the preservation and safety of fermented foods. The production of fermented dairy products, cured meats, vegetables, table olives, the production of alcoholic beverages, vinegar and the fermentation of soy, coffee and cocoa. In the context of the course, students become familiar with starter cultures, additives or technological aids used for the control of food fermentations, the equipment required for the industrial production of fermented foods, as well as for nutritional value and the role of probiotic microorganisms in fermented foods. All the above are studied in depth with the necessary degree of specialization, and with the use of many case studies and practical applications, so that a student can resolve complex problems which may arise in industrial production of fermented foods, and develop research and innovation (research and development of new products) in combination with knowledge from other courses (Microbiology, Chemistry, Biochemistry, Food Preservation, Food Biotechnology), in order to allow the production of new knowledge and the involvement of fermentation processes. Upon successful completion of the course, the student will be able to: • Obtain very detailed knowledge on all types of fermented foods and critical awareness of the differences in composition and quality characteristics between different types of fermented foods (solid and liquid). • Know in depth which microorganisms are responsible for smooth and desirable fermentation

and what are the unwanted-spoilage microorganisms in each case of fermented food, and combine all this specialized knowledge in order to resolve problems that may arise in industrial practice.

- Perceive the effect of environmental conditions, treatments and of the microbiome of fresh foods in the final result of their fermentation and acquire research skills on the characterization of the microbiome and the contribution of microbial metabolites on the quality of fermented foods.
- Know in depth the contribution of beneficial microorganisms to its taste aroma, acidity, texture, preservation and nutritional value of fermented foods products and be able to choose and manage different strategies or fermentation processes, in order to develop new, innovative products, and improve the quality characteristics of fermented foods.
- Delve into issues that concern the equipment and the technological requirements of industrial engineering production of fermented foods.
- Acquire specialized knowledge on the types and role of probiotic microbes present in fermented foods and their functions, in order to utilize them at research or production level in favor of human health



General Skills

- Search, analysis and synthesis of data and information, using and necessary technologies.
- Adaptation to new situations.
- Decision making.
- Autonomous work.
- Group work.
- Work in a multi-discipline environment.
- Production of new research ideas.
- Respect to the natural environment
- Exercise criticism and self-criticism
- Promotion of free, creative and inductive thinking
- Critical awareness of issues related to the specific discipline and interconnection of them with the industrial practice.

CONTENT

LECTURES

1st Week

Introduction to the basic concepts and the subject of Fermented Technology and Quality Food

2nd Week

Description of the starter culture species, the desired indigenous microflora fermented foods and their selection/prevalence criteria

3rd Week

Microbiome and Quality of Fermented Foods. Effect of microorganisms on preservation, safety and the organoleptic characteristics of fermented foods

4th Week

Types and production technology of fermented dairy products (microorganisms fermentation and spoilage, equipment, production stages, quality parameters)

5th Week

Types and production technology of fermented vegetables (fermentation microorganisms and spoilage, equipment, production stages, quality parameters)

6th Week

Types and production technology of table olives (fermentation microorganisms and spoilage, equipment, production stages, quality parameters)

7th Week

Types and production technology of fermented sausages (fermentation microorganisms and spoilage, equipment, production stages, quality parameters)

8th Week

Types and technology of beer production (fermentation and spoilage microorganisms, equipment, production stages, quality parameters)

9th Week

Types and technology of wine production (fermentation and spoilage microorganisms, equipment, production stages, quality parameters)

10th week

Types and production technology of wine cider and vinegar (fermentation microorganisms and spoilage, equipment, production stages, quality parameters) 11th Week Types and production technology of soy sauce, fermented coffee and cocoa (fermentation and spoilage microorganisms, equipment, production steps, quality parameters)

12th Week

The role and properties of probiotic microbes in fermented foods.

13th Week

Review and Summary of the main points of the lesson or educational visit

LAB EXERCISES

1st Production of kefir, sour milk, yogurt

2nd Production of caseri / gruyere

3rd Production of pickled vegetables and table olives

5th Production of air salami and prosciutto

6th Beer production

7th Vinegar Production



TEACHING AND LEARNING METHODS - EVALUATION

TEACHING METHOD.	Face to face lectures in the auditorium/classroom and face to face laboratory exercises in an appropriate laboratory.														
USE OF INFORMATION AND COMMUNICATION TECHNOLOGIES	• Use of I.C.T. in Teaching, in Laboratory Education, in Communication with the students • Use of ICT in Teaching • Use of ICT in Laboratory Education (Usage software for statistical control of the quality of food) • Use of ICT in Communication with students The course material (theory and exercises) is posted in the e-class of the DFSN of UT. Communication with the students is done through announcements on the e- class. From this platform, students can communicate by email with the teacher.														
TEACHING STRUCTURE	<table><tr><th>Activity Semester</th><th>Workload</th></tr><tr><td>Lectures</td><td>39</td></tr><tr><td>Lab exercises</td><td>39</td></tr><tr><td>Studying</td><td>17</td></tr><tr><td>Preparation for exams</td><td>30</td></tr><tr><td>Course Total: (25 hours of workload per credit unit)</td><td>125</td></tr></table>	Activity Semester	Workload	Lectures	39	Lab exercises	39	Studying	17	Preparation for exams	30	Course Total: (25 hours of workload per credit unit)	125		
Activity Semester	Workload														
Lectures	39														
Lab exercises	39														
Studying	17														
Preparation for exams	30														
Course Total: (25 hours of workload per credit unit)	125														
EVALUATION OF STUDENTS	The evaluation language is Greek. The final grade of the course is formed by 70% of his grade theoretical part and by 30% from laboratory courses. The theoretical part exams include questions multiple choice and development or judgment questions. The exams of the laboratory part include questions selection and exercises.														

BIBLIOGRAPHY

-Suggested Bibliography:

- FOOD MICROBIOLOGY, KARL R. MATTHEWS, KALMIA E. KNIEL, THOMAS J. MONTVILLE [Details](#)
- TECHNOLOGY OF DAIRY PRODUCTS - FERMENTED PRODUCTS, ICE CREAM, BUTTER CREAM, ZERFYRIS GRIGORIS [Details](#)
- FOOD BIOTECHNOLOGY, ROUKAS TRIANTAFYLLOS [Details](#)
- BIOTECHNOLOGY AND INDUSTRIAL FERMENTS, Ilias Nerantzis, Panagiotis Tataridis, Stylianos Logothetis [Details](#)
- Science and Technology of Milk and Dairy Products - 2nd Edition, Kehagias Christos, Tsakali Efstathia [Details](#)
- MALT AND BREED TECHNOLOGIES, Ilias Nerantzis, Panagiotis Tataridis, Despina Kehagia [Details](#)
- BIOTECHNOLOGY AND INDUSTRIAL FERMENTS, Ilias Nerantzis, Panagiotis Tataridis, Stylianos Logothetis [Details](#)

-Related scientific journals:

- Food Biotechnology
- Fermentations
- Food Science and Biotechnology
- Natural Product Research



- Foods