



QUALITY CONTROL AND FOOD SAFETY-QUALITY MANAGEMENT SYSTEMS
COURSE OUTLINE

GENERAL

SCHOOL	AGRICULTURAL SCIENCES		
DEPARTMENT	FOOD SCIENCE AND NUTRITION		
COURSE LEVEL	Undergraduate		
COURSE CODE	MK613	SEMESTER	6 th
COURSE TITLE	QUALITY CONTROL AND FOOD SAFETY-QUALITY MANAGEMENT SYSTEMS Course Coordinator: M. KAKAGIANNI		
INDEPENDENT TEACHING ACTIVITIES		WEEKLY TEACHING HOURS	ECTS
Lectures		3	5
Lab Lectures-exercises		2	
COURSE TYPE Background, General Knowledge, Scientific Area, Skill Development	Scientific Area, specialized background		
PREREQUISITES:	-		
LANGUAGE OF TEACHING AND EXAMINATIONS:	GREEK		
THE COURSE IS OFFERED TO ERASMUS STUDENTS	YES		
URL	https://food.uth.gr/poiotikos-organolhptikos-elegxos/		

TEACHING RESULTS

Teaching Results
The course introduces students to the principles of quality control and sensory evaluation and to food quality and safety assurance and management systems. It combines theoretical instruction with laboratory exercises and case studies from the food industry. Upon successful completion of the course, students will be able to: • Distinguish between the concepts of food quality, food safety, quality control and quality assurance. • Identify the main quality attributes of foods and assess their compliance with defined specifications. • Select appropriate basic sampling procedures and interpret quality control data using statistical tools and control charts. • Select and apply basic sensory discrimination, descriptive and preference–acceptance tests and interpret their results. • Identify biological, chemical and physical hazards, including allergens, in selected food production processes. • Apply HACCP principles to develop a basic plan for a specific case study. • Distinguish between prerequisite programmes (PRPs), operational prerequisite programmes (OPRPs) and critical control points (CCPs). • Explain the basic requirements of ISO 9001 and ISO 22000 and distinguish between management system certification and laboratory accreditation.



- Evaluate findings from a simulated audit, document nonconformities and propose corrections and corrective actions.
- Recognise cases of food adulteration and fraud and explain the role of traceability and analytical methods in food authenticity testing.

General Skills

- Application of knowledge in practice
- Searching, analysing and synthesising data using appropriate technologies
- Adapting to new situations
- Decision-making
- Independent work
- Teamwork
- Working in an interdisciplinary environment
- Working in an international environment
- Generating new research ideas
- Critical reflection and self-criticism
- Promoting free, creative and inductive thinking

COURSE CONTENT

THEORY

1. Basic concepts of food quality and safety. Quality control, quality assurance and quality management. Food quality attributes, quality factors and specifications.
2. Sampling and food acceptance sampling plans. Basic principles of statistical quality control, process variability and control charts. Problem-solving tools and continuous quality improvement.
3. Introduction to sensory evaluation: human senses as an analytical tool, organisation of tests and applications in the food industry. Evaluation of appearance, colour, structure, texture, odour and taste. Discrimination tests, descriptive tests and preference–acceptance tests. Basic principles of processing and interpreting results and their relationship with instrumental measurements.
4. Basic regulatory framework for food quality, hygiene and safety, with emphasis on its application in food businesses.
5. Basic principles and terminology of quality management systems according to ISO 9000 and requirements of ISO 9001. Documentation of procedures, process control and quality improvement.
6. Biological, chemical and physical food safety hazards, including allergens. Hazard identification and assessment and selection of appropriate control measures.
7. Prerequisite programmes (PRPs), good hygiene practices and good manufacturing practices. Principles and steps in developing a HACCP (Hazard Analysis and Critical Control Point) plan, illustrated through examples and case studies.
8. Food Safety Management Systems according to ISO 22000. Selection and categorisation of control measures, operational prerequisite programmes (OPRPs) and critical control points (CCPs). Monitoring, validation and verification.
9. Internal and external audits, documentation of nonconformities, corrections and corrective actions. Management system certification and comparative presentation of food safety certification schemes, including schemes recognised by GFSI. Basic concepts of laboratory accreditation.
10. Food adulteration, misdescription and fraud. Traceability and basic principles of authenticity testing. Analytical methods for food identification and authenticity testing.

LABORATORY

- Sampling and preparation of food samples.
- Organisation and design of sensory tests. Basic senses and descriptive evaluation.
- Sensory discrimination tests, including the duo-trio test.
- Sensory preference–acceptance tests.
- Processing and interpretation of quality control and sensory evaluation data using computational tools.



- Application of ISO 9001 in case studies from the food industry.
- Development of a basic HACCP plan for a selected food production process: hazard analysis, selection of control measures and identification of critical control points.
- Application of ISO 22000 in case studies, distinguishing between PRPs, OPRPs and CCPs.
- Simulated audit: documentation of findings and nonconformities and proposals for corrections and corrective actions.
- Case studies on the accreditation and suitability of food testing laboratories.

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 ICT in teaching, laboratory education and communication with students. Use of computational tools for data processing and statistical quality control of foods. Teaching materials, exercises, announcements and assessment criteria are posted on the Department's e-class platform. Communication takes place through e-class and email.		
TEACHING STRUCTURE	Activity Semester	Workload	
	Lectures	39	
	Laboratory exercises	26	
	Study and completion of exercises and case studies	20	
	Independent study and preparation for examinations	40	
	Course Total: (25 hours of workload per credit unit)	125	
EVALUATION OF STUDENTS	Assessment language: Greek. 1. Final written theory examination (70% of the final grade), comprising multiple-choice questions, short-answer questions and extended-response questions. The final examination constitutes summative assessment. 2. Laboratory assessment (30% of the final grade), through a final laboratory examination. Feedback during laboratory exercises supports formative assessment. The final laboratory examination constitutes summative assessment. Assessment criteria, weighting and requirements for successful completion of the course are announced at the beginning of the semester and posted on e-class.		

RECOMMENDED BIBLIOGRAPHY

Suggested textbooks

Greek-language textbooks; titles are translated into English.

- Quality Control – Chemometrics and Authenticity of Foods of Plant and Animal Origin. Maria



- Cabañero, A. I., Recio, J. L., & Rupérez, M. (2008). Isotope ratio mass spectrometry coupled to liquid and gas chromatography for wine ethanol characterization. *Rapid Communications in Mass Spectrometry: An International Journal Devoted to the Rapid Dissemination of Up-to-the-Minute Research in Mass Spectrometry*, 22(20), 3111-3118.
- Camin, F. E. D. E. R. I. C. A., Bontempo, L. U. A. N. A., Heinrich, K., Horacek, M., Kelly, S. D., Schlicht, C., ... & Rossmann, A. (2007). Multi-element (H, C, N, S) stable isotope characteristics of lamb meat from different European regions. *Analytical and bioanalytical chemistry*, 389(1), 309-320.
- Calderone, G., Reniero, F., & Guillou, C. (2006). Isotopic analysis of ethanol: study on $^{18}\text{O}/^{16}\text{O}$ measurement using a high-temperature pyrolysis system coupled to an isotope ratio mass spectrometer. *Rapid communications in mass spectrometry*, 20(5), 937-940.
- HACCP - THE QUALITY APPROACH, Evangelos Evmorfopoulos, 1st Edition, 2020, Publications:
- EMBRYO COMMERCIAL PUBLISHING UNIT. IKE
- Food and Beverage Quality and Safety, Tsaknis Ioannis, 1st Edition, 2018, Publications: A. TZIOLA & SONS S.A.
- Food safety, Arvanitoyannis Ioannis S., Sandrou Dimitra, Kourtis Lazaros, Edition 1st, 2001, Publications: UNIVERSITYSTUDIOPRESS - ANONYMOUS COMPANY OF GRAPHIC ARTS AND PUBLICATIONS
- Hazard Analysis Critical Control Points (HACCP) in the Food Industry, Tzia Konstantina, Tsiapouris Alexandros, 1st Edition, 1996, Publishers: A. PAPASOTIRIOU & SIA I.K.E.
- ELOT EN ISO 9000 (2015). Quality management systems – Fundamentals and vocabulary, Hellenic Organization for Standardization, Athens
- ELOT EN ISO 9001 (2015). Quality management systems – Requirements, Hellenic Organization for Standardization, Athens
- ELOT EN ISO 19011 (2018). Guidelines for auditing management systems, Hellenic Organization for Standardization, Athens
- ELOT EN ISO 22000 (2018). Food safety management systems – Requirements for any organization in the food chain, Hellenic Organization for Standardization, Athens