

## STERILISATION TECHNIQUES

1	Course Title:	STERILISATION TECHNIQUES	
2	Course Code:	GSD3219	
3	Type of Course:	Optional	
4	Level of Course:	First Cycle	
5	Year of Study:	3	
6	Semester:	5	
7	ECTS Credits Allocated:	3.00	
8	Theoretical (hour/week):	2.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	-	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. Ö.UTKU ÇOPUR	
15	Course Lecturers:	Doç. Dr. C. Ece TAMER	
16	Contact information of the Course Coordinator:	Uludağ Üniversitesi Ziraat Fakültesi Gıda Mühendisliği Bölümü 16059 Görükle/Bursa Tel: 0224 2941491 Fax: 0224 2941402 e-posta: ucopur@uludag.edu.tr	
17	Website:		
18	Objective of the Course:	Heat treatment have a common application area in multiple branches of food industry. For this reason the aim of this course is to teach fundamental principles of heat treatment and advanced sterilization techniques. Another aim is to educate the student as a qualified food engineer in this area.	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	The students will be able to learn fundamental principles of heat treatment.
		2	The students will be able to have knowledge about the equipments used for sterilization.
		3	The students will be able to learn the factors affecting heat transfer.
		4	The students will be able to learn sterilization calculations and interpret the results.
		5	The students will be able to learn the advanced technologies used for food sterilization.
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21	Course Content:		
		<b>Course Content:</b>	
Week	Theoretical	Practice	

1	Terminology About Heat Transfer			
2	Fundamentals of Heat Treatment			
3	Principles of Convection, Conduction and Radiation			
4	Factors Effecting the Resistance of Microorganisms to Heat			
5	Factors Effecting the Resistance of Microorganisms to Heat			
6	Heat Transfer to Product			
7	Overall Evaluation of the Subjects			
8	Calculation of Sterilization Parameters			
9	Calculation of Sterilization Parameters			
10	Irradiation Systems			
11	Equipments Used for Food Sterilization			
12	Ohmic Heating			
13	Ultrasound and High Hydrostatic Pressure			
14	Pulsed Electric Field			
22	Textbooks, References and/or Other	Tamer, C.F. 2009. Sterilization Techniques, Unpublished		
Activites		Number	Duration (hour)	Total Work Load (hour)
Theoretical	Ankara , 388 s.	14	2.00	28.00
Practicals/Labs		0	0.00	0.00
Self study and preperation	Makinaları. Hacettepe Üniv. Gıda Müh. Fak. Ders Kitabı. 454	14	1.00	14.00
Homeworks		0	0.00	0.00
Projects	Acar, J., F. Şahbaz. 1995. Gıda Mühendisliğinde Sterilizasyon Değerlendirmeye Yöntemleri. Literatür	5	0.00	0.00
Field Studies		0	0.00	0.00
Midterm exams		1	25.00	25.00
Others	Sun, D.W. 2005. Emerging Technologies for Food Series. 771 p.	0	0.00	0.00
Final Exams			30.00	30.00
Total Work Load				122.00
Total work load/ 30 hr		İşlemler. Gıda Teknolojisi Derneği, Ankara. 586 s.		9.23
ECTS Credit of the Course				3.00
		Isıtma Yöntemleri. Sidas Medya. 352 s.		
23	Assesment			
TERM LEARNING ACTIVITIES		NUMBE R	WEIGHT	
Midterm Exam		1	40.00	
Quiz		0	0.00	
Home work-project		0	0.00	
Final Exam		1	60.00	
Total		2	100.00	
Contribution of Term (Year) Learning Activities to Success Grade		40.00		
Contribution of Final Exam to Success Grade		60.00		

Total								100.00								
Measurement and Evaluation Techniques Used in the Course																
24	ECTS / WORK LOAD TABLE															
25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ10	PQ11	PQ12	PQ13	PQ14	PQ15	PQ16
ÖK1	5	4	2	4	4	2	2	5	3	4	3	0	0	0	0	0
ÖK2	5	3	2	4	4	2	2	5	2	4	3	0	0	0	0	0
ÖK3	5	4	2	4	4	2	2	5	3	4	3	0	0	0	0	0
ÖK4	5	4	2	4	4	2	2	5	3	3	3	0	0	0	0	0
ÖK5	5	4	2	4	4	2	2	5	3	5	3	0	0	0	0	0
LO: Learning Objectives    PQ: Program Qualifications																
Contribution Level:	1 very low			2 low			3 Medium			4 High			5 Very High			