

INSTRUMENTAL ANALYSIS

1	Ders Adı:	INSTRUMENTAL ANALYSIS
2	Ders Kodu:	GMD4244
3	Ders Türü:	Zorunlu
4	Ders Seviyesi	Lisans
5	Dersin Verildiği Yıl:	4
6	Dersin Verildiği Yarıyıl	8
7	Dersin AKTS Kredisi:	2.00
8	Teorik Ders Saati (saat/Hafta)	1.00
9	Uygulama Ders Saati(saat/Hafta)	0.00
10	Laboratuvar Ders Saati (saat/hafta) :	2
11	Dersin Önkoşulu:	
12	Dersin Dili:	İngilizce
13	Dersin Veriliş Şekli:	Yüz yüze
14	Dersin Koordinatörü:	Doç.Dr. ARZU AKPINAR BAYİZİT
15	Dersi Veren Diğer Öğretim Elemanları:	
16	Koordinatör İletişim Bilgileri:	Bursa Uludağ Üniversitesi Ziraat Fakültesi Gıda Mühendisliği Bölümü C Blok Görükle Kampüsü 16059 Bursa Tel: 0224 2941496 Fax: 0224 2941402 e-posta: abayizit@uludag.edu.tr
17	Dersin WEB adresi:	
18	Dersin Amacı:	To teach the basic principles and application of spectroscopy, electrometry and chromatography techniques used in the examination of the composition or contaminants of foodstuffs.
19	Dersin Mesleki Gelişime Katkısı:	The students will have a brief knowledge on food analysis carried out with instruments.
20	Dersin Öğrenme Kazanımları:	
	1	Understanding the importance of instrumental analysis methods among other chemical analysis methods
	2	Having knowledge about instrumental analysis devices and understanding the basic principles on which it is based
	3	Understanding the usage areas of instrumental analysis methods in food industry
	4	Selecting the instrumental analysis methods and equipment suitable for the desired component.
	5	To be able to explain the differences of analysis method from other methods
	6	Ability to apply instrumental analysis methods to various foods
	7	Evaluating, interpreting and preparing reports on instrumental analysis results
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21	Dersin İçeriği:	

Hafta	DERS İÇERİKLERİ	
	Teorik	Uygulama
1	Introduction to Instrumental Analysis; Qualitative and Quantitative Instrumental Analysis; Gravimetric, Volumetric and Instrumental Analysis and their Food Applications	Instrumental Analysis; Gravimetric, Volumetric and Instrumental Analysis and their Food Applications
2	Light-Material Interactions; Behaviour of Light; Characteristics of Light	Light-Material Interactions; Behaviour of Light; Characteristics of Light
3	UV Visible Molecular Absorption Spektroskopy	UV Visible Molecular Absorption Spektroskopy
4	Infrared Spectroscopy Raman Spectroscopy Nucleic Magnetic Resonance (NMR) Spectroscopy Mass Spectroscopy (MS)	Infrared Spectroscopy Raman Spectroscopy Nucleic Magnetic Resonance (NMR) Spectroscopy Mass Spectroscopy (MS)
5	Evaluation of Optic Charateristics of Various Foods	Evaluation of Optic Charateristics of Various Foods
6	Analysis of Antioxidant Capacity in Foods	Analysis of Antioxidant Capacity in Foods
7	Atomic Absorption Spectroscopy Atomic Emission Spectroscopy ICP-MS (operation principles, lamps, atomisers, monochromators and detectors)	Atomic Absorption Spectroscopy Atomic Emission Spectroscopy ICP-MS (operation principles, lamps, atomisers, monochromators and detectors)
8	Mineral Element Analysis in Foods	Mineral Element Analysis in Foods
9	Electroanalytic Methods (Voltammetry, Polarography, Amperometry, Conductometry (conductivity), Potentiometry); Potentiometric Titrations in Food Industry	Electroanalytic Methods (Voltammetry, Polarography, Amperometry, Conductometry (conductivity), Potentiometry); Potentiometric Titrations in Food Industry
10	Colour Analysis; Colour Determination of Foods with Hunter Lab System; Textural Analysis; Texture Analysis of Cookies with TA-XT2 Texture Analyser	Colour Analysis; Colour Determination of Foods with Hunter Lab System; Textural Analysis; Texture Analysis of Cookies with TA-XT2 Texture Analyser
11	hromatography Methods; Column, Paper and Thin Layer Chromatography (TLC)	hromatography Methods; Column, Paper and Thin Layer Chromatography (TLC)
12	Gas and Liquid Chromatography (principles, analytic methods, derivatisation, columns, carrier gas, detectors, retention time, chromatogram); Electrophoretic Methods	Gas and Liquid Chromatography (principles, analytic methods, derivatisation, columns, carrier gas, detectors, retention time, chromatogram); Electrophoretic Methods
13	Application of Chromatographic Methods in Fatty Acid and Phenolic Content Analysis	Application of Chromatographic Methods in Fatty Acid and Phenolic Content Analysis
14	Electrophoretic analysis	Electrophoretic analysis

22	Ders Kitabı, Referanslar ve/veya Diğer Kaynaklar:	1. GÜNDÜZ, T. 2005. Instrumental Analiz, Gazi Yayınevi, 1357 s. 2. GÜNDÜZ, T. 2005. Kantitatif Analiz (Ders & Lab), Gazi Yayınevi, 1322 s. 3. DİKMAN, E. 1985. Enstrümental Analiz, Çağlayan Kitapevi, 271 s. 4. YETİM, H., ÇAM, M. 2009. Enstrümental Gıda Analizleri, Erciyes Üniversitesi Yayınları, 286 s. 5. BOLLAG, D.M., EDELSTEIN, S.J. 1991. Protein Methods. Wiley-Liss Pub., 415 p. 6. HIŞIL, Y. 2010. Enstrümental Gıda Analizleri (3 Cilt Birarada). Ege Üniversitesi Basımevi, İzmir, 545 s. 7. SKOOG, D.A., HOLER, F.J., NIEMAN, T.A. 2007. Principles of Instrumental Analyses. Brooks Cole Publ., 1039 p. 8. ROBINSON, J.W., SKELLY, E.M., FRAMEII, G.M. 2004. Undergraduate Instrumental Analysis, CRC Press, 1080 p.
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23	Değerlendirme
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YARIYIL İÇİ ÇALIŞMALAR	SAYISI	KATKI YÜZDESİ
Ara Sınav	0	0.00
Kısa Sınav	0	0.00
Ödev	1	40.00
Yıl Sonu Sınavı	1	60.00
Toplam	2	100.00
Yıl içi çalışmalarının Başarıya Oranı		40.00
Finalin Başarıya Oranı		60.00
Toplam		100.00
Kullanılan Ölçme ve Değerlendirme Yaklaşımları	The evaluation of the course is realised by a final exam and term project .	

24	AKTS / İŞ YÜKÜ TABLOSU
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ETKİNLİK	SAYISI	Süresi (Saat)	Toplam İş Yüğü (Saat)
Teorik Dersler	14	1.00	14.00
Uygulamalı Dersler	14	2.00	28.00
Sınıf Dışı Ders Çalışma Süresi (Ön çalışma, pekiştirme)	0	0.00	0.00
Ödevler	0	0.00	0.00
Projeler	0	0.00	0.00
Arazi Çalışmaları	0	0.00	0.00
Arasınavlar	0	0.00	0.00
Diğer	0	0.00	0.00
Yarıyıl Sonu Sınavı	1	25.00	25.00
Toplam İş Yüğü			67.00
Toplam İş Yüğü / 30 saat			2.23
Dersin AKTS Kredisi			2.00

25	PROGRAM YETERLİLİKLERİ İLE DERS ÖĞRETİM KAZANIMLARI İLİŞKİSİ TABLOSU															
	PY1	PY2	PY3	PY4	PY5	PY6	PY7	PY8	PY9	PY10	PY11	PY12	PY13	PY14	PY15	PY16
ÖK1	5	5	3	4	5	3	0	4	0	4	0	0	0	0	0	0

ÖK2	5	0	0	5	5	0	0	0	0	0	0	0	0	0	0	0
ÖK3	5	4	5	5	4	0	0	4	0	0	0	0	0	0	0	0
ÖK4	5	3	0	5	4	0	0	3	0	3	0	0	0	0	0	0
ÖK5	4	4	3	3	4	0	0	4	0	3	0	0	0	0	0	0
ÖK6	4	4	3	4	4	0	0	3	3	2	0	0	0	0	0	0
ÖK7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK: Öğrenme kazanımlar PY: Program yeterlilikleri																
Katkı Düzeyi:	1 çok düşük			2 Düşük			3 Orta			4 Yüksek			5 Çok Yüksek			