ENVIRONMENTAL INSTRUMENTAL ANALYSIS

1	Course Title:	ENVIRONMENTAL INSTRUMENTAL ANALYSIS	
2	Course Code:	CEV5102	
3	Type of Course:	Optional	
4	Level of Course:	Third Cycle	
5	Year of Study:	1	
6	Semester:	2	
7	ECTS Credits Allocated:	6.00	
8	Theoretical (hour/week):	2.00	
9	Practice (hour/week):	0.00	
10	Laboratory (hour/week):	2	
11	Prerequisites:	None	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. FATMA OLCAY TOPAÇ	
15	Course Lecturers:		
16	Contact information of the Course Coordinator:	Prof.Dr. F. Olcay Topaç Bursa Uludağ Üniversitesi Mühendislik Fakültesi Çevre Mühendisliği Bölümü olcaytopac@uludag.edu.tr 02242942109	
17	Website:		
18	Objective of the Course:	To give basic principles of instrumental analysis methods and relations between the related concepts. To introduce basic laboratory equipments. To gain practicle experience in laboratory skills.	
19	Contribution of the Course to Professional Development:	The course develops professional laboratory analysis skills by providing information about instrumental analysis methods frequently used in the field of environmental engineering.	
20	Learning Outcomes:		
		1	Have an understanding of working principles of laboratory equipments. Have the ability of using them properly and securely.
		2	Be able to recognize and use several laboratory materials (glassware and chemicals).
		3	Have an understanding of preperation processes which should be done prior to instrumental analysis
		4	Have the ability to compare the instrumental analysis methods which are used in several areas of environmental engineering (air, water, soil,…) for the determination of different parameters. Have the ability to express related results.
		5	Have the ability to define the factors that affect instrumental analysis

	6	Have the ability to pursue the new instrumental analysis methods which develops/alters in parallel to the development of science and technology. Have the ability to choose the optimum method under the prevailing conditions.
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21	Course Content:

Course Content:

Week	Theoretical	Practice
1	Introduction to the course, introduction to the laboratories.	Introduction to pHmeter and pH measurement.
2	Instrumental analysis, the relationship between beam and matter, absorption of the beam.	Introduction to conductivity meter and measurement of electrical conductivity.
3	Photometric analysis	Introduction to flame photometer and preparation of solutions for the determination of sodium-potassium.
4	Colorimetric analysis	Determination of sodium-potassium with flame photometer
6	Turbidimetric and nefelometric analysis	Introduction to turbidimeter and measurement of turbidity.
		solutions for the determination of organic carbon.
		Spectrophotometric determination of organic carbon
		solutions for the determination of ammonium nitrogen
		analyzer.
13	Atomic absorption spectroscopy	Introduction to AAS, measurement with AAS.
14	Presentation of homeworks	Introduction to TOC analyzer, measurement of inorganic carbon withTOC analyzer.

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	14	2.00	28.00
Self study and preperation	14	5.00	70.00
Homeworks	1	20.00	20.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	0	0.00	0.00
Others	0	0.00	0.00
Final Exams	1	40.00	40.00
Total Work Load			186.00
Total work load/ 30 hr			6.20
ECTS Credit of the Course			6.00

22	Textbooks, References and/or Other Materials:	-Instrumental Analysis, Turgut Gündüz, Bilge Publ., 1993, Ankara. -Instrumental Analysis, Emin Dikman, Çağlayan Publ., 1985, İstanbul -Instrumental Analysis, Atilla Yıldız, Hacettepe Univ. Publ.,1993, Ankara -The Principles of Instrumental Analysis / Douglas A. Skoog, F. James Holler, Timothy A Nieman ; trans.. ed. :Esma Kılıç, Fitnat Köseoğlu, Hamza Yılmaz, Bilim Yayınevi, 2000, Ankara.
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	0	0.00
Quiz	0	0.00
Home work-project	1	40.00
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		Homework and final exam

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	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	5	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK3	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK4	0	0	0	0	0	5	0	0	0	5	0	0	0	0	0	5
ÖK5	0	0	4	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK6	0	0	0	0	0	5	0	0	0	0	0	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**