ENVIRONMENTAL QUANTITATIVE ANALYSIS

1	Course Title:	ENVIRONMENTAL QUANTITATIVE ANALYSIS	
2	Course Code:	CEV1030	
3	Type of Course:	Compulsory	
4	Level of Course:	First Cycle	
5	Year of Study:	1	
6	Semester:	2	
7	ECTS Credits Allocated:	5.00	
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:	Doç.Dr. FATMA OLCAY TOPAÇ	
15	Course Lecturers:		
16	Contact information of the Course Coordinator:	olcaytopac@uludag.edu.tr	
17	Website:		
18	Objective of the Course:	To present a basic information about chemistry related with environmental engineering issues and to gain an experience in doing-evaluating laboratory experiments of environmental engineering as well as an understanding of qualitative-quantitative analysis.	
19	Contribution of the Course to Professional Development:		
20	Learning Outcomes:		
		1	Have an adequate knowledge about laboratory equipments and their working procedures.
		2	Have the ability of using laboratory equipments properly and securely.
		3	Be able to recognize and use laboratory materials (glassware and chemicals).
		4	Have the ability of doing and explaining laboratory experiments related to environmental engineering issues.
		5	Have the ability of reporting the results of experiments.
		6	Be able to evaluate the environmental impacts of contaminants.
		7	Have an understanding of the chemical reactions occurred in various steps of treatment processes.
		8	Have the ability to pursue the developing/altering qualitative-quantitative analysis methods and to choose the optimum one under prevailing conditions.
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21	Course Content:	
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Week	Theoretical	Practice
1	Content, objectives and outcomes of the course. Matter and components, homogenous and heterogeneous matters, solutions (true solutions, colloidal solutions, suspensions), solvents (hydrophobic solvents, hydrophilic solvents).	Laboratory safety rules, Introduce to laboratory equipments
2	Saturation degree of solutions (unsaturated, saturated , supersaturated solutions), azeotropic solutions and mixtures, water solubility of several compounds, dipol property of water and dissolving effects.	Gravimetric determination of chloride.
3	Water solubility of metallic compounds, salts, bases with hydroxyl, metal oxides, polar covalent bonded compounds and ametallic compounds with hydrogen bond.	Gravimetric determination of sulphates.
4	Water solubility of ametallic oxides and some organic compounds, electricity-conducting/non conducting solutions, electrolyte solutions.	Standardization of dilute acidic and basic solutions with primer standards.
	the effects of temperature, pressure and concentration on equilibrium).	
6	Homogenous and heterogeneous equilibrium in dilute aqueous solutions, homogenous	Neutralimetric determinations II: Co-determination of alkaline hydroxide and alkaline carbonate
	common ion effect on equilibrium reactions, acids and bases.	
7	Solution concentrations and preparation of solutions (by weight and by volume; molal	Neutralimetric determinations III: Co-determination of alkaline carbonates and bicarbonates
	concentrating of solutions, problem solving.	
9	pH of electrolyte solutions, pH of acidic	Preparation of standard potassium per manganate solution
	strong, weak and very weak acids, problem solving.	
10	pH of dilute polybasic acid solutions (dibasic acids, tribasic acids, pH of the mixtures of two weak acids), pH of dilute basic solutions (strong-weak bases).	Determination of easily-oxidizable organic carbon
11	pH of dilute salt solutions and hydrolysis (pH of salt solutions with strong acid and weak base, pH of salt solutions with weak acid and strong base, pH of salt solutions with weak acid and weak base) buffer solutions and preparations.	Determination of chloride ions by Mohr method

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	3.00	42.00
Homeworks	1	10.00	10.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	10.00	10.00
Others	2	10.00	20.00
Final Exams	1	12.00	12.00
Total Work Load			160.00
Total work load/ 30 hr			5.00
ECTS Credit of the Course			5.00

12	Properties of buffer solutions, pH of buffer solutions, buffer capacity, problem solving.	Determination of calcium and magnesium ions.
13	Heterogeneous equilibrium of sparingly soluble salts (solubility product, molar solubility, calculation of solubility from solubility product), problem solving.	Determination of ammonium nitrogen by distillation
14	Factors affecting solubility of sparingly soluble salts (temperature, common ion, foreign ion, OH3+ concentrations, hydrolysis, solvent effects), problem solving	Laboratory exam (theoretical and practical part)

22	Textbooks, References and/or Other Materials:	
23	Assesment	

TERM LEARNING ACTIVITIES	**NUMBER**	**WEIGHT**
Midterm Exam	1	20.00
Quiz	3	15.00
Home work-project	1	5.00
Final Exam	1	60.00
Total	6	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	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0
ÖK3	4	0	0	0	4	0	5	0	0	0	0	0	0	0	0	0
ÖK4	3	0	0	0	5	0	5	0	0	0	0	0	0	0	0	0
ÖK5	0	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0
ÖK6	5	0	0	0	4	0	0	0	0	0	0	0	0	0	0	0
ÖK7	5	0	0	0	3	0	0	0	0	0	0	0	0	0	0	0
ÖK8	5	0	0	0	4	0	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**