NANOTECHNOLOGY IN ENVIRONMENTAL ENGINEERING

1	Course Title:	NANOTECHNOLOGY IN ENVIRONMENTAL ENGINEERING
2	Course Code:	CEV5273
3	Type of Course:	Optional
4	Level of Course:	Third Cycle
5	Year of Study:	1
6	Semester:	1
7	ECTS Credits Allocated:	6.00
8	Theoretical (hour/week):	3.00
9	Practice (hour/week):	0.00
10	Laboratory (hour/week):	0
11	Prerequisites:	None
12	Language:	Turkish
13	Mode of Delivery:	Face to face
14	Course Coordinator:	Doç. Dr. ARZU TEKSOY
15	Course Lecturers:	
16	Contact information of the Course Coordinator:	e-mail: arzu@uludag.edu.tr Tel: 0224-2942121 Adres: Bursa Uludağ Üniversitesi　　　　　Mühendislik Fakültesi Çevre Mühendisliği Bölümü Nilüfer/Bursa, TÜRKİYE
17	Website:	
18	Objective of the Course:	to give information about using nanotechnology on environmental pollution control, to explain effect of nanomaterials on human health and environment and to teach legal regulations about nanotechnology
19	Contribution of the Course to Professional Development:	Students who successfully complete the course will learn about nanomaterials used in many fields today and their use in pollution prevention in Environmental Engineering.
20	Learning Outcomes:	

		1	Students learn nanomaterials and their production technologies.
		2	Students have information about applications of nanotechnology on environmental engineering (removal of water, air and soil pollution).
		3	Students learn possible effects of nanomaterials on environment and human health.
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21	Course Content:	

Course Content:	

Week	Theoretical	Practice
1	Introduction to nanotechnology , description of nanotechnology	

2	structural, chemical and optical characteristics of nanomaterials,			
3	Produstion Technologies of nanomaterials			
4	Characterization of nanomaterials (SEM,AFM,VSI etc.)			
5	Using nanosensors for determination of environmental pollution , and spesifications of nanosensors			
6	Application of nanotechnolgy			
7	Nanotechnology applications in soil pollution control			
8	Nanotechnology applications in air pollution control			
9	Midterm exam			
10	Nanotechnology applications in groundwater pollution control			
11	Potential ecological damages of nanomaterials			
12	Effect of nanomaterials on human health			
13	Future of nanotechnology, and related regulations			
14	Homework presentation			

22	Textbooks, References and/or Other Materials:	1.Wiesner, M.R., Bottero, J., Environmental Nanotechnology, McGraw Hill, 2007.

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	3.00	42.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	14	3.00	42.00
Homeworks	1	40.00	40.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	20.00	20.00
Others	0	0.00	0.00
Final Exams	1	35.00	35.00
Total Work Load			179.00
Total work load/ 30 hr			5.97
ECTS Credit of the Course			6.00

(Textbook references overlapping the activities table:)
National Academic Press, Washington D.C. 2005.
4. Bhushan, B., Handbook of Nanotechnology, Springer
5.Masciangioli, T., Zhang, W., Environmental technologies at nanoscale, EnvironmentalScience and Technology
6.EPA, 2003. EPA's program for nanotechnology, Environmental Protection Agency Office of Research and

TERM LEARNING ACTIVITIES	NUMBE	WEIGHT
Midterm Exam	1	25.00
Home work-project	1	15.00
Final Exam	1	60.00
Total	3	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	In order to determine the success of the students, questions in the form of classical, multiple choice and cloze test are asked in the exams.In addition, students are expected to prepare homework on specific topics 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	0	5	0	0	0	0	0	0	0	4	0	0	0	0	0	0
ÖK2	0	0	0	5	5	0	0	0	0	0	0	0	0	0	0	5
ÖK3	0	0	0	0	5	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