DESIGN OF DRAINAGE SYSTEMS									
1	Course Title:	DESIGN	OF DRAINAGE SYSTEMS						
2	Course Code:	BSM4530-S							
3	Type of Course:	Optional							
4	Level of Course:	First Cycle							
5	Year of Study:	4							
6	Semester:	8							
7	ECTS Credits Allocated:	3.00							
8	Theoretical (hour/week):	2.00							
9	Practice (hour/week):	1.00							
10	Laboratory (hour/week):	0							
11	Prerequisites:	None							
12	Language:	Turkish							
13	Mode of Delivery:	Face to face							
14	Course Coordinator:	Prof. Dr. KEMAL SULHİ GÜNDOĞDU							
15	Course Lecturers:								
16	Contact information of the Course Coordinator:	e-posta : aodemir@uludag.edu.tr Telefon: 0 224 2941616 Adres: Uludağ Üniversitesi, Ziraat Fakültesi, Biyosistem Mühendisliği Bölümü, Görükle Kampüsü, 16059, Nilüfer/BURSA							
17	Website:								
18	Objective of the Course:	The purpose of this course is to recognize the importance of agricultural drainage, define the agricultural drainage, know some soil properties in terms of drainage and the basic laws concerning soil water movement, perform drainage surveys, and to design surface and subsurface drainage systems.							
19	Contribution of the Course to Professional Development:	In this course, information is given on the planning and design of surface and subsurface drainage systems for the removal of excess water in agricultural areas in order to provide optimum plant growing conditions. The course contributes directly to professional development.							
20	Learning Outcomes:								
		1	define the agricultural drainage and appreciate its importance						
		2	explain the soil properties in terms of drainage						
		3	explain the basic laws of soil water movement						
		4	perform the drainage surveys and hydraulic conductivity measurements						
		5	design the open drainage channels						
		6	design the surface drainage systems						
		7	design the subsurface drainage systems						
		8	select the drainage pipes considering the conditions						
		9	perform operation and maintenance of the drainage systems						
		10	make reclamation projects for saline-alkaline soils						
21	Course Content:								
		Co	ourse Content:						
Week	Theoretical		Practice						

1	The concept and definition of agricult drainage	ural								
2	The concept and definition of agricult drainage	ural	Drawing the soil moisture characteristic curve using the laboratory results							
3	Principles of agricultural drainage		P	ermeability measureme	ents in the laborato	ry				
4	Drainage surveys		ТΙ	he hydraulic conductivi	ty measurements in	n the field				
5	Hydraulic conductivity measurements	3	The hydraulic conductivity measurements in the field							
6	Surface drainage systems		D	etermination of surface	e runoff for the desig	gn project				
7	Design principles of open drainage cl	hannels	Calculations concerning the design of open drainage channels							
8	Repeating courses and midterm exar	n								
9	Subsurface drainage systems		Calculation of drain spacing							
10	Selection and testing of drain pipes		Determination of the drain diameter for the hydraulic design of subsurface drainage systems							
11	Installation of drain pipe lines with tre and trenchless machines	ncher	Calculations concerning the material selection in pipe drainage							
12	Pipe drainage systems maintenance		Slide show concerning the installation of drain pipe lines with trencher and trenchless machines and pipe drainage systems maintenance							
13	Diagnosis of the saline, sodic, boron acidic soils	and	Interpretation of laboratory results concerning the diagnosis of the saline, sodic, boron and acidic soils							
14	Reclamation of the saline, sodic, bore acidic soils	on and	C le	alculating the amount of aching water for the sa	of reclamation mat aline, sodic, boron a	erial and and acidic soils				
					<u> </u>	 -				
Activit	es			Number	Duration (hour)	Total Work Load (hour)				
Theore	tical		าะ 3	<u> </u>	SA 100 Viotman and D.W.	14.00 Rvcroft.				
Practica	als/Labs			14	2.00 28.00					
Self stu	dy and preperation		α 5	Tancis The Nethenar	2.00	26.00				
Homew	vorks			1	3.00	3.00				
Project	6		Reclamation and Improvement, Publication Nr. 962, 199							
Field St	tudies			0	0.00	0.00				
Midtern	1 exams			1	6.00	6.00				
Others				0	0.00	0.00				
Final E	xams	R		1	13.00	13.00				
Total W	/ork Load					96.00				
Powial w	ork load/ 30 hr	0	0	00		3.00				
ECTS (Credit of the Course					3.00				
Final E	xam	1	60.00							
Total		2	100.00							
Contrib Succes	ution of Term (Year) Learning Activities s Grade	es to	40.00							
Contrib	ution of Final Exam to Success Grade	9	60.00							
Total			100.00							
Measur Course	FCTS / WORK LOAD TABLE	sed in the	The measurement and evaluation of student success is made according to the article 32 of the "Bursa Uludağ University Associate and Undergraduate Education Regulation."							

25	CONTRIBUTION OF LEARNING OUTCOMES TO PROGRAMME QUALIFICATIONS															
	PQ1	PQ2	PQ3	PQ4	PQ5	PQ6	PQ7	PQ8	PQ9	PQ1 0	PQ11	PQ12	PQ1 3	PQ14	PQ15	PQ16
ÖK1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ÖK2	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
ÖK3	4	0	0	0	4	0	0	3	0	2	3	0	0	0	0	0
ÖK4	3	4	3	0	4	0	0	3	0	2	4	3	0	0	0	0
ÖK5	3	4	4	3	5	0	0	3	0	2	4	4	0	0	0	0
ÖK6	3	4	5	3	5	0	0	3	0	2	4	4	0	0	0	0
ÖK7	4	4	5	3	5	0	0	3	0	2	4	4	0	0	0	0
ÖK8	3	3	3	3	4	0	0	3	0	2	3	4	0	0	0	0
ÖK9	0	0	3	4	3	0	0	3	0	2	4	4	0	0	0	0
ÖK10	3	4	4	4	4	0	0	3	0	2	4	4	0	0	0	0
LO: Learning Objectives PQ: Program Qualifications																
Contrib ution Level:	Contrib 1 very low 2 lo ution Level:			2 low		3 Medium			4 High			5 Very High				