SHEETMETAL FORMING TECHNIQUES

1	Course Title:	SHEETMETAL FORMING TECHNIQUES	
2	Course Code:	MAK4008	
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):	0.00	
10	Laboratory (hour/week):	0	
11	Prerequisites:	-	
12	Language:	Turkish	
13	Mode of Delivery:	Face to face	
14	Course Coordinator:	Prof. Dr. ALİ BAYRAM	
15	Course Lecturers:	Öğr. Gör. Dr. Kurtuluş YİĞİT	
16	Contact information of the Course Coordinator:	e-mail : bayram@uludag.edu.tr Tlf: 0224-294 19 56 Adres : U.Ü. Müh.Mim.Fakültesi Makine Müh. Bölümü Görükle-BURSA	
17	Website:		
18	Objective of the Course:	To gain knowledge and ability about forming of metallic sheets and solving of problems, which are encountered during forming.	
19	Contribution of the Course to Professional Development:	1. Learns the basic information of sheet metal forming. 2. Establishes a link between the plastic behavior of the material and the geometry of the mold in solving the problems encountered in engineering applications.	
20	Learning Outcomes:		
		1	To be able to define basic knowledges belonging to sheet forming.
		2	To be able to reveal correlations of stress-strain.
		3	To be able to explain factors effecting deformation.
		4	To be able to define basic knowledges about cutting and cutting dies.
		5	To be able to define bending and spring-back.
		6	To be able to calculate bending force.
		7	To be able to define plastering and stretching forming methods.
		8	To be able to define principles of deep-drawing operation.
		9	
		10	
21	Course Content:		

Course Content:

Week	Theoretical	Practice

1	Course is introduced and knowledge about its content is given. An effect of structure of material; on plastical deformation is explained.	
2	Mechanical properties are briefly defined. Stress-strain diagrams are explained. Stress-strain correlations are derived.	
3	The factors effecting plastical deformation: Anisotropy of mechanical properties and deformation rate are explained.	
4	The factors effecting plastical deformation: Temperature, Friction and lubrication, Hydrostatic pressure and residual stress are explained	
5	Basic knowledge about cutting and cutting die design are given.	
6	The effective parameters on surface quality in cutting and bending processes are explained.	
7	Spring-back in bending, a knowledge about bending force calculation and die design are given.	
8	Repeating courses and midterm exam	
9	Practices for cutting and bending are done.	
10	and variations in thickness of material are explained.	
11	matrix materials, sheets used in deep-drawing are introduced.	
12	process are explained.	
13	using of forming diagrams are explained.	
14	Materials.	

Activites	Number	Duration (hour)	Total Work Load (hour)
Theoretical	14	2.00	28.00
Practicals/Labs	0	0.00	0.00
Self study and preperation	10	3.00	30.00
Homeworks	1	9.00	9.00
Projects	0	0.00	0.00
Field Studies	0	0.00	0.00
Midterm exams	1	6.00	6.00
Others	0	0.00	0.00
Final Exams	1	12.00	12.00
Total Work Load			85.00
Total work load/ 30 hr			2.83
ECTS Credit of the Course			3.00

S. Kayalı, C. Ensarı, ITÜ Kimya-Metalurji Fak. Ofset Atölvesi, 1986.
L. Çapan, Kurtuluş Matbaası, 1977.
3. Mechanical Metallurgy
4. Metal Working Science and Engineering
E. M. Mielnik, McGraw-Hill Book Inc., 1991.

23 Assesment

TERM LEARNING ACTIVITIES	NUMBER	WEIGHT
Midterm Exam	1	30.00
Quiz	0	0.00
Home work-project	1	10.00
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 ensure active participation of engineering students in the course, students are asked questions during the course. Incomprehensible matters are explained again.

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	4	3	1	1	1	1	1	1	1	1	1	1	1	1	0	0
ÖK2	4	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0
ÖK3	4	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0
ÖK4	4	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0
ÖK5	4	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0
ÖK6	4	3	1	1	1	1	1	1	1	1	1	1	1	1	0	0
ÖK7	4	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0
ÖK8	4	2	1	1	1	1	1	1	1	1	1	1	1	1	0	0

LO: Learning Objectives PQ: Program Qualifications

Contribution Level:	**1 very low**	**2 low**	**3 Medium**	**4 High**	**5 Very High**