

TOROS ÜNİVERSİTESİ

Faculty Of Engineering
Industrial Engineering (English)

Course Information

MANUFACTURING PROCESSES II					
Code	Semester	Theoretical	Practice	National Credit	ECTS Credit
		Hour / Week			
INE222	Spring	3	0	3	4

Prerequisites and co-requisites	none
Language of instruction	English
Type	Elective
Level of Course	Bachelor's
Lecturer	Assit. Prof. Dr. Fikri EGE
Mode of Delivery	Face to Face
Suggested Subject	none
Professional practise (internship)	None
Objectives of the Course	Introducing the basic concepts and processes of production metallurgy. Giving education towards the purpose of evaluation of our raw material sources and transforming them into products that advanced technology needs. Giving examples of industrial applications. Explaining principles that metallurgical processes bound to in terms of thermodynamics, kinetics and fluid mechanics. Identifying the factors that affect metallurgical processes. Solving numerical problems
Contents of the Course	Introduction and Basic Concepts / Ore Dressing: Crushing, Grinding, Beneficiation / Metallurgical Pretreatment Processes: Drying, Calcination, Agglomeration, Roasting / Pyrometallurgical Processes: Fuels, Reduction, Refractories, Furnaces, Smelting, Converting, Slags, Refining, Distillation / Hydrometallurgical Processes: Leaching and leaching mechanisms, Thermodynamics and kinetics of leaching, Metal recovery from solutions / Electrometallurgy: Electrolytic cells, Electrowinning, Electrorefining / Recycling and Recovering

Learning Outcomes of Course

#	Learning Outcomes
1	Learn metallurgical raw materials and principles of ore dressing, metallurgical pretreatment and pyro, hydro and electrometallurgical processes
2	Use and apply technologies, recognising their advantages and limitations, when applied to minerals and metallurgical information
3	Make calculations of material and energy balance related to metallurgical processes
4	Discuss the economic classification of metals, metal production and recycling.

Course Syllabus

#	Subjects	Teaching Methods and Technics
1	Introduction	Lecturing
2	Ore dressing	Lecturing
3	Metallurgical Pretreatment-1 (Drying - Calcination - Agglomeration)	Lecturing
4	Metallurgical Pretreatment-2 (Roasting)	Lecturing
5	Pyrometallurgy-1 (Fuels - Reduction)	Lecturing
6	Pyrometallurgy-2 (Refractories - Furnaces)	Lecturing
7	Pyrometallurgy-3 (Smelting)	Lecturing

8	Mid-Term Exam	Exam
9	Pyrometallurgy-4 (Converting - Slags)	Lecturing
10	Pyrometallurgy-5 (Refining - Distillation)	Lecturing
11	Hydrometallurgy-1 (Leaching)	Lecturing
12	Hydrometallurgy-2 (Metal recovery from solutions)	Lecturing
13	Electrometallurgy	Lecturing
14	Recycling/Recovering	Lecturing
15	Recycling/Recovering	Lecturing
16	Final Exam	

Course Syllabus

#	Material / Resources	Information About Resources	Reference / Recommended Resources
1	F.Y. Bor, Ekstraktif Metalurji Prensipleri, 1 ve 2. cilt, İTÜ, 1989.		
2	S. Cankut, Ekstraktif Metalurji, İTÜ Yayınları, Sayı 884, 1972		
3	A. Butts, Metalurji Problemleri, İTÜ Yayınları, Sayı 802, 1970.		

Method of Assessment

#	Weight	Work Type	Work Title
1	40%	Mid-Term Exam	Mid-Term Exam
2	60%	Final Exam	Final Exam

Relationship between Learning Outcomes of Course and Program Outcomes

#	Learning Outcomes	Program Outcomes	Method of Assessment
1	Learn metallurgical raw materials and principles of ore dressing, metallurgical pretreatment and pyro, hyro and electrometallurgical processes	1	1,2
2	Use and apply technologies, recognising their advantages and limitations, when applied to minerals and metallurgical information	2	1,2
3	Make calculations of material and energy balance related to metallurgical processes	1	1,2
4	Discuss the economic classification of metals, metal production and recycling.	2	1,2

PS. The numbers, which are shown in the column Method of Assessment, presents the methods shown in the previous table, titled as Method of Assessment.

Work Load Details

#	Type of Work	Quantity	Time (Hour)	Work Load
1	Course Duration	14	3	42
2	Course Duration Except Class (Preliminary Study, Enhancement)	14	2	28
3	Presentation and Seminar Preparation	0	0	0
4	Web Research, Library and Archival Work	0	0	0
5	Document/Information Listing	0	0	0
6	Workshop	0	0	0
7	Preparation for Midterm Exam	1	8	8
8	Midterm Exam	1	2	2
9	Quiz	0	0	0

10	Homework	0	0	0
11	Midterm Project	0	0	0
12	Midterm Exercise	0	0	0
13	Final Project	1	8	8
14	Final Exercise	0	0	0
15	Preparation for Final Exam	0	0	0
16	Final Exam	1	2	2
				90