Course Name						
DESIGN PROJECTS						
Code	**Semester**	**Local Credits**	**ECTS Credits**	**Course Implementation, Hours/Week**		
				Theoretical	**Tutorial**	**Laboratory**
MET 4901E	7	4	-	1	6	-

Department/Program	Metallurgical and Materials Engineering		
Course Type	Required	**Course Language**	English
Course Prerequisites	Min. 110 Credits (MET 339 MIN DD or MET 339E MIN DD) and (MET 364 MIN DD or MET 364E MIN DD) (*and all the courses in the first 4 semester of the related curriculum must have been successfully completed.*)		

Course Category by Content, %	**Basic Sciences**	**Engineering Science**	**Engineering Design**	**General Education**
			100	

Course Description	It is primarily aimed by this course that students should be able to use all the knowledge they attained through their engineering education in a specific subject, by carrying out a literature survey and, if required, followed by either an applied or experimental investigation, and gathering all this information in a written report of proper form. Additionally, they must learn how to follow and adhere to a work–time plan as scheduled. To develop their individual research capabilities is also targeted.
Course Objectives	The aim of this course is to teach students, who are about to graduate, 1. Learn how to conduct an individual research in their professional field and to gain a useful experience. 2. Learn students applied, experimental or solely a literature survey-based research 3. Learn how to prepare a project proposal 4. Learn how to perform an individual research and to present its results written and orally.
Course Learning Outcomes	Students learn how to assemble all the information they are taught until that time in various courses, to focus all this knowledge on a specific subject/purpose, and to obtain the maximum benefit out of this effort. They also learn how to accomplish a detailed literature survey about which they would have no prior knowledge and to transform all this work into a formally written report. Moreover, they learn how to prepare a work–time plan, to study according to this plan, as recommended by his/her adviser, and to be disciplined in this sense.
Textbook	• Literature suggested by the Faculty member by whom the thesis is assigned
Other References	
Homework & Projects	In “Problem Solving and Design Project class” the team members for graduation project are formed. In the beginning of the semester members of faculty announce their graduation projects. In order to get further information they may arrange an interview with the faculty. Students are free to choose from the projects announced with the permission of the project owner (faculty). Each team has one project. Each group has to prepare first their project proposal report and they present their proposal at the end of the first semester. To prepare project proposal “ITU Scientific Research Project Proposal Preparation Guide” is used. Presentations will last 20 minutes. Each member of the group has to present. Presentations are open to faculty and students. To prepare the Graduate Thesis in the form of a formal report, written according to the rules set in “Guide for Graduate Thesis Preparation” and to be successful in the defense.
Laboratory Work	
Computer Use	Hands on experience on MS Word, Excel, Powerpoint and Visio softwares
Other Activities	

Assessment Criteria	**Activities**	**Quantity**	**Effects on Grading, %**
	Midterm Exams		
	Quizzes		
	Homework		
	Projects		
	Term Paper/Project	**1**	**30**
	Laboratory Work		
	Other Activities		
	Final Exam	**1**	**70**

COURSE PLAN

Weeks	Topics	Course Outcomes
1	Determination of projects goals and literature search	I-IV
2	Evaluation of the department infrastructure and preparing project plan	I-IV
3	Presentation of the project proposals	I-IV
4	Preparation of infrastructure for research and experiments	I-IV
5	Preparation of infrastructure for research and experiments	I-IV
6	Conducting research/experiments	I-IV
7	Conducting research/experiments	I-IV
8	Collecting results from research/experiments	I-IV
9	Collecting results from research/experiments	I-IV
10	Collecting results from research/experiments	I-IV
11	Writing reports	I-IV
12	Editing reports	I-IV
13	Preparation of presentations and posters	I-IV
14	Submitting posters and reports to the department and presenting the projects to faculty and students	I-IV

Relationship between the Course and METALLURGICAL AND MATERIALS ENGINEERING **Curriculum**

	Program Outcomes	Level of Contribution		
		1	**2**	**3**
1	Ability to apply the knowledge of mathematics, science and engineering principles to solve problems in metallurgical and materials engineering (ABET:a)		x	
2	Ability to characterize materials using standard and/or self designed experimental methods and to evaluate the results (ABET:b)			x
3	Ability to design a system or a process, taking into consideration of the desired specifications, quality, ethics and environment. (ABET:c)			x
4	Ability to communicate both orally and in the written form and to take part in, and provide leadership of the teams in the elucidation of engineering problems; (ABET:d, g)		x	
5	Ability to define, formulate and solve engineering problems in the development, production, processing, protection and usage of engineering materials. (ABET:e)			x
6	An understanding of professional and ethical responsibilities(ABET:f)		x	
7	An understanding of current/contemporary issues and impact of engineering solutions in broad cultural, national and global levels;. (ABET:h, j)			x
8	A comprehension of the nature of engineering progress closely linked with the development of new materials and production processes. An ability to engage in life-long learning and a recognition of its necessity (ABET:i)			x
9	Ability to use essential tools and techniques of modern engineering in the development, production, processing, protecting and surface treatment of the existing and new engineering materials. (ABET:k)			x

1: Little, 2. Partial, 3. Full

Course relationships with major elements of the field and material classes

		Level of Contribution		
		1	**2**	**3**
MAJOR ELEMENT OF THE FIELDS	STRUCTURE		**x**	
	PROPERTIES		**x**	
	DESIGN EXPERIMENT/ANALYSE DATA			**x**
	PROCESSING			**x**
	COST/PERFORMANCE		**x**	
	QUALITY/ENVIRONMENT		**x**	
	DESIGN PROCESS OR PRODUCT			**x**
MATERIAL CLASSES	METAL		**x**	
	CERAMICS		**x**	
	POLYMERS		**x**	
	COMPOSITES		**x**	

1: Little, 2. Partial, 3. Full

Prepared by	**Date**	**Signature**
Department Chair	December 2020	