DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGIES
COURSE SYLLABUS

Course Details				
Code	**Academic Year**			**Semester**
EBT321	4			7
Title	**T**	**A**	**L**	**ECTS**
Thin Film Coating Technologies	3	0	0	6

Language	German					
Level	**Undergraduate**	**X**	**Graduate**		**Postgraduate**	
Department / Program	Energy Science and Technology					
Forms of Teaching and Learning	Face-to-face					
Course Type	**Compulsory**		**Elective**	**X**		
Objectives	The objective of this course is to define thin films and explain thin film coating methods. It aims to provide knowledge about current thin film coating technologies, their application areas, and characterization methods used after thin film deposition.					
Content	This course covers the definition of thin films and vacuum techniques. Additionally, it includes physical coating methods (evaporation techniques: Electron Beam, Thermal; sputtering, spraying, sol-gel), film thickness determination techniques, structural analysis methods (XRD, SEM), and application areas of thin films.					
Prerequisites	None					
Coordinator	Assist. Prof. Dr. Gülsüm Gündoğdu					
Lecturer(s)	Assist. Prof. Dr. Gülsüm Gündoğdu					
Assistant(s)						
Work Placement	None					

Recommended or Required Reading	
Books / Lecture Notes	Thin Film Device Applications; Chopra K.L.; Plenum Press; ISBN- 0-306-41297-7. 2. Handbook of Deposition Technologies for Thin Film and Coating, Science, Application and Technology; Third Edition; Martin P. M.; Elsevier;ISBN–13: 978-0-8155-2031-3.
Other Sources	Thin Film Device Applications; Chopra K.L.; Plenum Press; ISBN- 0-306-41297-7. 2. Handbook of Deposition Technologies for Thin Film and Coating, Science, Application and Technology; Third Edition; Martin P. M.; Elsevier;ISBN–13: 978-0-8155-2031-3.

Additional Course Material	
Documents	
Assignments	
Exams	

Course Composition

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGIES
COURSE SYLLABUS

Mathematics und Basic Sciences		%
Engineering	20	%
Engineering Design	30	%
Social Sciences		%
Educational Sciences		%
Natural Sciences	20	%
Health Sciences		%
Expert Knowledge	30	%

Assessment

Activity	Count	Percentage (%)
Midterm Exam		
Quiz		
Assignments		
Presentation	1	40
Recitations		
Projects		
Final Exam	1	60
	Total	**100**

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	14	3	42
Self-Study	11	10	110
Assignments			
Presentation / Seminar Preparation	1	14	14
Midterm Exam			
Recitations			
Laboratory			
Projects			
Final Exam	1	2	2
		Total Work Load	**168**
		ECTS Points (Total Work Load / Hours)	**6**

Learning Outcomes

1	The students will have the knowledge about thin films. Students will learn the preliminary preparations required for thin film production.
2	students will know the coating methods of thin film production, compare the methods with each other and choose the method for their own studies.
3	Students will be able to solve the problems that may occur in thin film production.

DEPARTMENT OF ENERGY SCIENCE AND TECHNOLOGIES
COURSE SYLLABUS

4	Students will know the methods of examining the characteristics of thin films produced.
5	Students will aquire knowledge of application fields of thin films.
Weekly Content	
1	Definition of thin films and general application areas
2	Vacuum techniques
3	Thin film deposition methods, physical methods, evaporation
4	Evaporation by electron bombardment
5	Thermal evaporation
6	Coating by sputtering
7	Coating by spraying, polycrystals, and epitaxial growth
8	Presentation
9	Coating by sol-gel method
10	Film thickness measurement methods
11	Methods for analyzing the structural properties of thin films: XRD, SEM
12	Optical properties of thin films
13	Electrical properties of thin films
14	Magnetic properties of thin films – Part 1
15	Magnetic properties of thin films – Part 2
16	Final Exam

Contribution of Learning Outcomes to Program Objectives (1-5)

	P1	P2	P3	P4	P5	P6	P7	P8	P9
1	5	5	5	5	5	5	5	5	5
2	5	5	5	5	5	5	5	5	5
3	5	5	5	5	5	5	5	5	5
4	5	5	5	5	5	5	5	5	5
5	5	5	5	5	5	5	5	5	5
Contribution Level	1: Low 2: Low-intermediate 3: Intermediate 4: High 5: Very High								

Compiled by:	
Date of Compilation:	