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 aim of the course is to define thin film and explain thin film coating methods. To provide information about the application areas of current thin film coating technologies and the characterization methods that can be used for thin films.								
Content	Definition of thin film, Vacuum techniques, Methods of coating thin films: Physical methods; Evaporation (Electron Beam, Thermal), Spraying, Sputtering, Sol-gel, Film thickness determination, Structural analysis methods; XRD, SEM, thin film's application areas.								
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	

Additional Course Material	
Documents	
Assignments	
Exams	

Course Composition		
Mathematics und Basic Sciences		%
Engineering	20	%
Engineering Design	30	%

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Social Sciences		%
Educational Sciences		%
Natural Sciences	20	%
Health Sciences		%
Expert Knowledge	30	%

Assessment

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

ECTS Points and Work Load

Activity	Count	Duration	Work Load (Hours)
Lectures	14	3	42
Self-Study	14	7	98
Assignments			
Presentation / Seminar Preparation	1	14	14
Midterm Exam			
Recitations			
Laboratory			
Projects			
Final Exam	1	2	2
		Total Work Load	**156**
		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.
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.

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Weekly Content	
1	Definition of thin film and general usage areas
2	Vacuum Technics
3	Thin film production methods, Physical methods, Evaporation
4	Evaporation with Electron Beam
5	Thermal Evaporation
6	Coating by Sputtering
7	Spray coating, polycrystalline and epitaxial growth
8	Presentation
9	Coating by sol-gel
10	Film thickness measurement methods.
11	Structural analysis methods of thin films, XRD, SEM
12	Optical properties of thin films
13	Electrical properties of thin films
14	Magnetic Properties of Thin Films
15	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
https://obs.tau.edu.tr/oibs/bologna/progLearnOutcomes.aspx?lang=EN&curSunit=5706	
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