



AYDIN ADNAN MENDERES UNIVERSITY COURSE INFORMATION FORM

Course Title		Advanced Vacuum Physics							
Course Code		FZK618		Course Level		Third Cycle (Doctorate Degree)			
ECTS Credit	7	Workload	178 (<i>Hours</i>)	Theory	3	Practice	0	Laboratory	0
Objectives of the Course		To obtain information on vacuum systems.							
Course Content		Nature of vacuum and it's creation. Properties of gases, Concepts of fluid flow and pumping. Vacuum systems. Vacuum gauges and gas analysis methods and the elimination of gas leakage is detected.							
Work Placement		N/A							
Planned Learning Activities and Teaching Methods				Explanation (Presentation), Experiment					
Name of Lecturer(s)									

Assessment Methods and Criteria

Method	Quantity	Percentage (%)
Midterm Examination	1	20
Final Examination	1	30
Practice	7	7
Quiz	2	8
Attending Lectures	14	28
Assignment	7	7

Recommended or Required Reading

1	Ultrahigh Vacuum and it's Applications. Richard W.Roberts, Thomas A. Vanderslice
2	Vacuum Physics and Techniques. T.A. Delchar
3	Vacuum Physics and Technology. G.L Weissler, R.W. Carlson
4	Vacuum Techniques. Çelik Tarımcı, Hüseyin Sarı

Week	Weekly Detailed Course Contents	
1	Theoretical	The nature and the creation of the vacuum.
2	Theoretical	The properties of gases, fluid flow and pumping concepts, vacuum systems
3	Theoretical	The vacuum chamber design, unloading and gas pumping, pumping system design
4	Theoretical	Ordinary vacuum pumps, diffusion pumps, molecular pumps
5	Theoretical	Molecular drag pumps and tubomoleküler
6	Theoretical	Molecular drag pumps and tubomoleküler
7	Intermediate Exam	Midterm
8	Theoretical	Cryogenic pumps, ultra high vacuum: gettering and ion pumping
9	Theoretical	Cryogenic pumps, ultra high vacuum: gettering and ion pumping
10	Theoretical	Sputter-ion pumps
11	Theoretical	Sputter-ion pumps
12	Theoretical	Vacuum gauges and gas analysis
13	Theoretical	Vacuum gauges and gas analysis
14	Theoretical	Measurements methods and elimination of gas leakage
15	Final Exam	Final Exam

Workload Calculation

Activity	Quantity	Preparation	Duration	Total Workload
Lecture - Theory	14	3	3	84
Lecture - Practice	1	3	4	7
Assignment	7	3	1	28
Quiz	2	10	2	24
Midterm Examination	1	10	2	12



Final Examination	1	20	3	23
Total Workload (Hours)				178
[Total Workload (Hours) / 25*] = ECTS				7
*25 hour workload is accepted as 1 ECTS				

Learning Outcomes

1	He/She should know the properties of gases.
2	Be able to express the importance of vacuum media for the materials to be prepared.
3	He/She can say types of vacuum systems and vacuum pumps
4	He/She can say methods of analysis and the perception of leaks in gas leakage
5	To be able to generalize methods and apply them to new problems

Programme Outcomes (Physics Doctorate)

1	
2	
3	
4	
5	
6	
7	
8	

Contribution of Learning Outcomes to Programme Outcomes 1:Very Low, 2:Low, 3:Medium, 4:High, 5:Very High

	L1	L2	L3	L4	L5
P1	5	3	1	1	2
P2	5	3	2	1	2
P3	4	2	1	2	3
P4	3	4	4	5	2
P5	3	4	4	5	3
P6	5	5	4	4	4
P7	5	3	3	5	4
P8	5	5	5	5	5

