

Graduate School of Health Sciences / Orthosis-Prosthesis M.S.

2024 - 2025 Academic Year

ADVANCED MATERIAL TECHNOLOGY I

Syllabus

Course Description					
Name	Code	Semester	T+A Hour	Credit	ECTS
ADVANCED MATERIAL TECHNOLOGY I	OPZY1134640	Fall Semester	2+0	2	8
Prerequisites Courses					
Recommended Elective Courses					
Language of Instruction	Turkish				
Course Level	Second Cycle (Master's Degree)				
Course Type	Elective				
Course Coordinator	Assoc.Prof. Esra ATILGAN				
Name of Lecturer(s)	Prof.Dr. Yavuz YAKUT				
Assistant(s)					
Aim	Is to evaluate materials and methods used in orthotic and prosthetic technology				
Course Content	This course contains; Properties and production of the metal, Specific usage of metals, Phase equilibrium diagrams, Solid resolution, Structural properties of Microcrystals, Composites, The theory and effects of solid solution hardening, Methods and their effects on properties, Welding Techniques, Brass Techniques, Brazing Techniques, The effect of welding, brass, brazing techniques on the structure, Adapting the metals on prosthetic technology, Adapting the metals on orthotic technology.				
Course Learning Outcomes			Teaching Methods	Assessment Methods	
Discusses the metals used in orthotic and prosthetic technology.			10, 16, 9	A	
Summarizes the production of metals and their use in the field of orthotic prosthetic.			10, 12, 14, 9	A	
Discusses the usage methods and techniques of metals used in orthosis and prosthesis technology.			10, 16, 9	A	
Interprets phase equilibrium diagrams of metals.			10, 14, 9	A	
It exemplifies the structural features of microcrystals.			10, 12, 14, 9	A	
Teaching Methods	10: Discussion Method, 12: Problem Solving Method, 14: Self Study Method, 16: Question - Answer Technique, 9: Lecture Method				
Assessment Methods	A: Traditional Written Exam				
Lecture Schedule					
Sequence	Topics	Preliminary Preparation			
1	Properties and production of the metal	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
2	Specific usage of metals	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
3	Phase equilibrium diagrams	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
4	Solid resolution	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
5	Structural properties of Microcrystals	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
6	Composites	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
7	The theory and effects of solid solution hardening	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
8	Methods and their effects on properties	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
9	Welding Techniques	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
10	Brass Techniques	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
11	Brazing Techniques	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
12	The effect of welding, brass, brazing techniques on the structure	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
13	Adapting the metals on prosthetic technology	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
14	Adapting the metals on orthotic technology	Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6			
Evaluation Methods		Weight(%)			
Midterm Exam		50			
General Exam		50			

Resources
Podcast presentations prepared for the course 1) AAOS Atlas of Orthoses and Assistive Devices Frank Gottschalk, MD, MB, BCh, 2013 2) Atlas of Amputations and Limb Deficiencies/Douglas G. Smith MD, 2013 3) Orthotics and Prosthetics in Rehabilitation/Lusardi & Jorge & Nielsen, 2013 4) Introduction to Orthotics/Breand Coppard, Helene Lohman, Fourth Edition, 2015 5) Orthotic Intervention for the Hand and Upper Extremity, Marylyn Jacobs, Noelle Austin, Second Edition, 2014