**Graduate School of Health Sciences / Orthosis-Prothesis M.S.**

**2024 - 2025 Academic Year**

**ADVANCED MATERIAL TECHNOLOGY II**

**Syllabus**

| **Course Description** | | | | | |
|---|---|---|---|---|---|
| **Name** | **Code** | **Semester** | **T+A Hour** | **Credit** | **ECTS** |
| ADVANCED MATERIAL TECHNOLOGY II | OPZY1234740 | Spring Semester | 2+0 | 2 | 8 |

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| **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 plastic materials used in orthotic andprosthetic technology |
| **Course Content** | This course contains; Plastic and its viscoelastic features,Plastic and types of molecular structures,Cosmopolitan utensils and their features,Monomers, polymers, additives,The effect of production method on microstructure and mechanical properties,Role and importance of fabrication process in prosthetics and orthotics technologies,The effects of the manufacturing process; micro-changes, shrinkage and distortion,Resins and foams,Reinforcing fibers,Casting and other water-set resins and mechanical properties,Fabrication processes and their effect on materials,Resources, adhesives and its effect on structure and properties,The varieties of plastic used in prosthetic and orthotic technology,The recent technologies used in prosthetic and orthotic technology. |

| **Course Learning Outcomes** | **Teaching Methods** | **Assessment Methods** |
|---|---|---|
| Discusses plastics used in orthosis and prosthetic technologies. | 10, 12, 16, 4, 5, 9 | A |
| Tests types of plastic and molecular structures. | 10, 12, 4, 6, 9 | A |
| Distinguishes composite materials. | 10, 12, 14, 4, 9 | A |
| Evaluates fabrication processes. | 10, 12, 16, 4, 6, 9 | A |
| Relates the effect of the production method on microstructures and mechanical properties. | 10, 12, 4, 6, 9 | A |

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| **Teaching Methods** | 10: Discussion Method, 12: Problem Solving Method, 14: Self Study Method, 16: Question - Answer Technique, 4: Inquiry-Based Learning, 5: Cooperative Learning, 6: Experiential Learning, 9: Lecture Method |
| **Assessment Methods** | A: Traditional Written Exam |

**Lecture Schedule**

| **Sequence** | **Topics** | **Preliminary Preparation** |
|---|---|---|
| 1 | Plastic and its viscoelastic features | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 2 | Plastic and types of molecular structures | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 3 | Cosmopolitan utensils and their features | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 4 | Monomers, polymers, additives | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 5 | The effect of production method on microstructure and mechanical properties | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 6 | Role and importance of fabrication process in prosthetics and orthotics technologies | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 7 | The effects of the manufacturing process; micro-changes, shrinkage and distortion | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 8 | Resins and foams | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 9 | Reinforcing fibers | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 10 | Casting and other water-set resins and mechanical properties | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 11 | Fabrication processes and their effect on materials | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 12 | Resources, adhesives and its effect on structure and properties | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 13 | The varieties of plastic used in prosthetic and orthotic technology | Source 1 - Chapter 2-3, Source 2 - Chapter 9-10-11-33, Source 4 - Chapter 3, Source 5 - Chapter 5-6 |
| 14 | The recent technologies used in prosthetic and 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(%)** |
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| Midterm Exam | 50 |
| General Exam | 50 |

**Resources**

Podcast presentations prepared for the

course1)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 fort he Hand and Upper Extremity,Marylyn Jacobs,Noelle Austin,Second Edition, 2014