

## ORTHOPEDIC PROSTHESIS AND ORTHOTICS PROGRAM

### 2024-2025 COURSE CONTENTS

#### SEMESTER I

##### **MYO101- BASIC ANATOMY AND PHYSIOLOGY**

**(3+0),ECTS:4**

Introduction to Anatomy and Physiology and short terminology, Axes, planes, Terms indicating location and direction; general information. Cell Theory, Structural features, Cell organelles, Cell division; Information on the provision of substance Exchange. Locomotor System Anatomy and Physiology- Osteology. Locomotor System; arthrology; General information, joint types, movements. myology; Anatomy, Contraction mechanism, Striated muscles, cardiac muscle, physiology of smooth muscles. Respiratory system Anatomy and Physiology. Nose, Paranasal sinuses, Larynx, trachea, Lungs. Physiology of Respiratory, ventilation, diffusion, Perfusion, Respiratory Regulation. Cardiovascular system Anatomy and Physiology. Blood: functions, components, formed elements of blood, Blood groups. Metabolism of the heart, heart sounds. Heart cavities, Veins. Digestive system Anatomy and Physiology I. Oral anatomy, Chewing muscles, Pharynx, Oesophagus, Stomach, Small-large intestines, Kc. Gallbladder, Pancreas, Digestive glands. Digestive System II. Digestion in the mouth, stomach, digestion in the small and large intestines. KC. functions, CHO digestion, Digestion of fat-proteins. Vitamin-Mineral-Electrolyte functions. Urinary System Anatomy and Physiology. Function of kidneys, nephron, urin formation, fluid-electrolyte balance. Distribution of water in the organism, Electrolytes-acid-base balance. Renin-angiotensin system. Genital organs-reproductive physiology. Female and male genital organs. Hormonal control of the reproductive system, hypothalamus, pituitary, gonadotropic hormones. Ovarian hormones, reproductive cycle. Endocrine system anatomy and physiology. Endocrine glands, their functions. Physiological functions of hormones, classification. Hormones and target cells. Nervous system Anatomy and Physiology. Development of nervous tissue, neuron types, functions, synapse, neuroglia cells. FAQ and PSS Sensory organs, Anatomy and Physiology. Ways of seeing, ways of hearing and balance.

##### **OPO115- VOCATIONAL TECHNOLOGY I**

**(2+0),ECTS:4**

Basic Concepts and Tools. Length Measurement Technique. Measurement Errors. Calibration. Calipers. Micrometers. Filing. Manual Cutting. Infinitives. Marking. Riveting. Welded joint.

##### **OPO101- MATERIAL INFORMATION I**

**(2+0),ECTS:3**

Definition and classification of materials. Mineral and non-mineral materials. Material inspection and methods, material selection. Conciseness, fragility, fatigue. Examination of the internal structure of materials. Metallographic examinations. Spark inspection, technological inspection. Alloys, irons, cast irons. Non-ferrous metals. Steels. Plastics. Occupational health and safety, safe use of tools and equipment.

**OPO119- PATTERN AND MODELAGE****(2+0),ECTS:4**

Materials Used in Workshop Applications. Orthotics Applications. Prosthesis Applications. Common Properties of Materials Used in Orthotics and Prosthesis Applications. Modelling Principles in Lower Extremity Orthoses. Modelling Principles in Upper Extremity Orthoses. Modelling Principles in Spinal Orthoses. Modelling Principles in Lower Extremity Prosthesis. Modelling Principles in Upper Extremity Prosthesis. Modelling Principles in Lower Extremity Prosthesis. Future of Applications.

**RPSI209- POSITIVE PSYCHOLOGY AND COMMUNICATION SKILLS (HSE)****(2+0),ECTS:3**

Definition of Positive Psychology and Learning the Basic Concepts. Learning The Theoretical Fundamentals Of Positive Psychology. Learning the Brain Infrastructure of Social Behaviors. Emotional Intelligence, Emotional Intelligence in Adults, Children and Youth, Marriage and Business Life, Principles of Emotional Intelligence, Learning the Relationship of Emotional Intelligence with Personality Development, Marriage and Business Life. Learning the Concepts Related to Self-Knowledge and Awareness. Recognizing Others and Learning the Concepts of Empathy. Learning Communication Skills. Learning Motivation and Planning Skills. Learning Problem Solving Skills. Learning Anger Control Skills. Learning Relationship Management Skills. Learning the Concept of Persistence and Impulse Control Skills. Learning Healthy Decision Making Skills. Learning the Concepts of Compromise.

**TURK103- TURKISH LANGUAGE I****(2+0),ECTS:2**

Language and its features; The relationship of language, which is a social institution, with nation, culture and thought; Classification of world languages and the place and importance of Turkish among these languages; Spoken language, written language and historical development periods of Turkish written language; The current situation of Turkish and its spreading areas, sounds and sound events in Turkish; Syllable knowledge, vowels and consonants in Turkish words; Spelling rules and punctuation marks.

**INGU103- ENGLISH I****(2+0),ECTS:2**

to meet, verb to be, subject pronouns. Demonstrative pronouns, countable/uncountable nouns, quantitative expressions. Simple present tense, adverbs of frequency. Object pronouns, possessive adjectives, have got/has got. -must,-must,(must/mustn t)-can,-can(can/can t). Past Tense (Simple Past Tense). Understands what he/she listens at the relevant level and makes comments. Increases vocabulary with various reading passages. Present tense. Conjunctions (and-but-that's why-because). Comparisons. Gains the ability to understand various English reading passages at intermediate level.

**ATA103- PRINCIPLES OF ATATURK AND HISTORY OF REVOLUTION I****(2+0),ECTS:2**

Concepts, definitions, lesson methods and definitions of resources. Industrial Revolution and the French Revolution. Disintegration of the Ottoman Empire (XIX. Century). Tanzimat and Reform Edict, I. and II. Constitutionalism. I. World, Tripoli and Balkan Wars. Mondros Armistice Agreement, Wilson Principles, Paris Conference. M. Kemal's Departure to Samsun and the Situation in Anatolia. Amasya Circular, National Congresses, Opening of the Parliamentary Assembly. The Establishment of the

Parliament and Internal Revolts. Teskilat-ı Esasi Law, Establishment of the Regular Army. I. II. Great Offensive with İnönü, Kütahya-Eskişehir and Sakarya Pitched Battles. The treaties during the War of Independence. Lausanne Peace Treaty. Abolishing the Sultanate.

### **RKUL103- UNIVERSITY CULTURE I\* (ÜSEÇ)**

**(0+2),ECTS:4**

Each semester includes seminars, conferences, panels, workshops and talks to be held for 14 weeks within the framework of a program consisting of suggestions from academic units, student council and student clubs at the university.

## **SEMESTER II**

### **OPO126- INTRODUCTION TO PROSTHESIS\***

**(2+2),ECTS:5**

Definition, history and classification of the prosthesis. Causes of amputation. Levels of lower extremity amputation. Partial foot amputations and partial foot prosthesis. Prosthetic feet. Below the knee amputations. Below-knee socket types and below-knee prostheses. Knee disarticulation prostheses. Above knee amputation and prostheses. Upper extremity amputation levels and partial hand prostheses. Hand and elbow prostheses. Above elbow and shoulder disarticulation prostheses.

### **OPO128- MATERIAL INFORMATION II**

**(2+0),ECTS:3**

Joining methods solders welding rivets. Protection from work accidents and work safety. Metals. Plastics, thermoplastics, composites. Textile products fabrics. Fiberglass. Carbon fibers. Trees. Natural and artificial leather. Catalysts ceramics. Plasters. Alternative material and biomaterial. Application examples and ready-made orthopedic products.

### **FTP213- KINESIOLOGY**

**(2+0),ECTS:4**

Introduction to kinesiology. Bone tissue and bones. Muscle tissue. Cartilage and Joints. Vertebra. Pelvis. Hip joint. Knee joint. Foot and ankle joint. Shoulder joint. Elbow joint. Hand and wrist joint. Gait Analysis.

### **OPO132 ORTHOSIS ENTRY\***

**(2+2),ECTS:6**

Orthosis Definition and Classification. Basic Biomechanical Principles in Orthoses. Materials Used in Orthoses. Foot and Ankle Biomechanics. Foot Deformity and Problems. Foot and Ankle Orthotic Elements and Features. Foot Orthoses. Ankle Orthoses

**OPO134- VOCATIONAL TECHNOLOGY II(BSEC)****(2+0),ECTS:4**

Soldering. Clamped joint. Detachable joints. Threading. Drilling and countersinking. Bending by hand  
Shaping by hammering. Riveting. Compressed air installation. Occupational safety and worker health.  
Regulation.

**INGU104- ENGLISH II****(2+0),ECTS:2**

Tenses: Present tense, Present tense, Past tense, Future tense structures; Modes: Might, Could, Can, Must, May; Adverbs: Place, Direction, Purpose, Adverbs of State; Adjectives: Order of adjectives, Comparison, Superlative structures; Passive Structure: Present, Extended, Past, Future passive structure; Conditional Phrases; Adjective Phrases; Transfer Sentences; Verb Structures: TO, -ING; Noun Phrases; Adverb Phrases; Comparative Structures.

**TURK104- TURKISH LANGUAGE II****(2+0),ECTS:2**

To gain the ability to use the mother tongue correctly; Punctuation marks and spelling rules, composition rules, writing types are discussed with examples in the course, where it is essential to generate ideas and write their thoughts in order to improve the abilities of the students who came to the university by gaining this skill. In addition, various novels, poetry books and theater works are read and studied. A reading theater is made in the classroom and applied emphasis and intonation lessons are given with various diction techniques.

**ATA104- Ataturk's Principles and History of Revolution II****(2+0),ECTS:2**

Recession of Ottoman Social and State Order and Reform Movements; The Disintegration of the Ottoman State and the Beginning of the National Struggle; Mustafa Kemal Pasha's Organization of the National Struggle in Anatolia; Opening of the First T.B.M.M.; Military and Political Developments Between 1920-1922; Revolutions and Counter-Reactions; Establishment of the Constitutional System; Domestic and Foreign Politics in the Republican Era; The Basic Features of the Turkish Revolution and the Thought Movements Affected by it; Innovations in Law, Education, Economy and Social Life; Atatürk's Principles and General Characteristics of These Principles; Evaluation of Kemalism in Ideological Perspective.

**RKUL 104- University Culture II\*(ÜSEÇ)****(0+2),ECTS:4**

Each semester includes seminars, conferences, panels, workshops and talks to be held for 14 weeks within the framework of a program consisting of suggestions from the academic units, student council and student clubs at the university.

### III. SEMESTER

#### **OPO207- PROSTHESIS I\*(BSEC)**

**(2+4), ECTS:8**

Measurement of below-knee prosthesis. Plastering the below-knee prosthesis. Manufacture of below-knee prosthesis. Hip disarticulation prosthesis construction. Partial hand and wrist prostheses measurement, plaster and manufacture. Hemipelvectomy, hemicorpectomy prosthesis construction. Soft socket preparation and construction, upper extremity silicone prostheses. Manufacture of below-knee prosthesis. Knee disarticulation prosthesis. Knee disarticulation prosthesis impression and plaster cast. Prosthesis cost calculation. Knee disarticulation modeling and manufacturing. Workshop organization and features of prosthetic knee and wrist joints.

#### **MET- 101 PROFESSIONAL ETHICS (HSE)**

**(2+0), ECTS:2**

Examining the concepts of ethics and morality. Examining the concepts of ethics and morality. Ethics systems. Ethical Principles. Ethical Dilemma. Professional Ethics. Professional Corruption. Ethical and Unethical Behaviors in Business Life. Professional Confidentiality. Patient Rights. Informed Consent. Ethics in the Public. Social Responsibility.

#### **OPO223- ORTHOSIS I\*(HSE)**

**(2+4), ECTS:8**

Knee Biomechanics. Knee Pathomechanics. Knee Orthoses. Long Walking Orthoses. Meningomyelocele and Orthoses. Fracture and Orthoses. DÇC and Orthoses. Leg Calve Perthes and Orthoses.

#### **OPO221- ORTHESIS ANALYSIS AND EVALUATION**

**(2+0), ECTS:4**

Analysis and evaluation introduction. Gait analysis. Pathological walking. Walking aids. Definition and importance of physical therapy. Orthotic rehabilitation. Things to consider in daily life. Orthoses and rehabilitation in rheumatological patients. Protective rehabilitation in geriatric patients. Muscle deformities and functional defects. Rehabilitation of contracture and orthosis patients.

#### **OPO229- CLINICAL DISEASES IN PROSTHETIC ORTHOSIS**

**(2+0), ECTS:3**

Fractures. Osteoarthritis. Neuropathy. Common injuries in the knee area. Developmental hip dysplasia. Osteoporosis. Rheumatoid arthritis, Ankylosing spondylitis. Stroke, Spinal cord injuries. Brachial plexus, Motor neuron diseases. Guillain barre syndrome. Sipina bifida, Cerebral palsy. Scoliosis.

#### **FIRST- 101 FIRST AID**

**(2+0), ECTS:3**

To apply the basic principles of first aid. To learn about the human body. Assess the patient/injured and the scene. To provide basic life support. To apply first aid in respiratory tract obstructions. To apply first aid in bleeding, shock, injuries. To apply first aid in burns, frostbite and heat stroke. To apply first aid in unconsciousness. To apply first aid in poisonings. To apply first aid in animal bites. To apply first aid in case of foreign body getting into eyes, ears and nose. To apply first aid in choking

To apply first aid in fractures, dislocations and sprains. Carrying the sick and injured

#### **IV. SEMESTER**

##### **OPO204- PROSTHESIS II\***

**(2+4), ECTS:8**

Upper extremity amputation levels. Upper extremity amputation levels. Finger amputations and prostheses. Wrist amputation and prostheses. Forearm amputation and prostheses. Elbow amputation and prostheses . Above-elbow amputation socket types. Types of above-elbow amputation sockets. Shoulder amputation and prostheses. Shoulder amputation and prostheses. Upper extremity ligament systems. Upper extremity ligament systems.

##### **OPO208- PROSTHESIS ANALYSIS AND EVALUATION**

**(2+0), ECTS:3**

Evaluation of Syme/chopart partial foot prostheses. Evaluation and rehabilitation of below-knee prostheses. Evaluation and rehabilitation of knee disarticulation prostheses. Evaluation and rehabilitation of above-knee prostheses. Evaluation and rehabilitation of hip disarticulation prostheses. Evaluation and rehabilitation of hip disarticulation prostheses. Evaluation and rehabilitation of wrist prostheses. Evaluation and rehabilitation of forearm prostheses. Evaluation and rehabilitation of elbow disarticulation prostheses. Evaluation and rehabilitation of above-elbow prostheses. Evaluation and rehabilitation of shoulder disarticulation prostheses. Implementation and evaluation of the Harness system.

##### **OPO212- ORTHOSIS II\***

**(2+4), ECTS:8**

Spine Orthoses. Cervical and Cervicothoracic Orthoses. Thoracolumbosacral Orthoses. Lumbosacral Orthoses. Scoliosis Orthoses. Functional Anatomy of the Hand. Mechanics of the Hand. Upper Extremity Functional Anatomy. Static Orthoses. Contracture Orthoses. Tendon Incision Orthoses. Upper Extremity Shoulder-Elbow Orthoses. Pediatric Splints. Upper Extremity Orthoses in Hemiplegia.

##### **OPO224- BIOMEDICAL TECHNOLOGY (BSEC)**

**(2+0), ECTS:2**

Introduction and Course Description. Historical Development of Medical Devices and Biomedical Device Technologies. Relationship of Biomedical Engineering with Other Sciences. Bioengineering, Medical Engineering and Clinical Engineering. The Situation of Biomedical Device Technology in Education and Sector in Our Country. Employment Areas of Biomedical Device Technicians, Duties and Responsibilities of Biomedical Device Technicians. Basic Biomedical Instrumentation and Measurement. Human Body, Overview. Introduction to Medical Measurement Techniques. Biomedical Instrumentation in the Nervous System. Biomedical Instrumentation in the Cardiovascular System. Biomedical Instrumentation in Other Systems. Biomaterials and Tissue Engineering. Assessment of the Course.

**MYO015- Social Responsibility Project**

**(2+0), ECTS:2**

What is Social Responsibility? What is the purpose of social responsibility? Why social responsibility studies are important, creation of social responsibility project, what are corporate social responsibility studies? Determining the Project. Preparation of the presentation covering the determined project subject, project purpose and project team. Presentation by students of what has been done for the project so far. FIELD STUDY-APPLICATION. Evaluation

**OPO999- SUMMER INTERNSHIP\*\*\***

**(0+0), ECTS:9**

To give the student the ability to practice in the field, accompanied by the theoretical knowledge he received during the semester.

\*Applied Lesson

\*\*Vocational Training in Business

\*\*\*Internship

BSEC: Departmental Electives

HSSE: University Elective Courses