

RADIOTHERAPY PROGRAMME 2024-2025 COURSE CONTENTS

I. SEMESTER

MAT101 BASIC MATHEMATICS

Numbers, Exponents, Rooted Numbers, Absolute Value, Factorisation, Ratio Proportion, Equations, 1st Order Equations with 1 Unknown, 1st Order Equations with 2 Unknowns, Inequalities, Functions, Numerical Logic.

MYO101 BASIC ANATOMY AND PHYSIOLOGY

Introduction to Anatomy and Physiology, Cell theory, Cell organelles, Substance exchange, Cell metabolism, Locomotor System Anatomy and Bone, joint and muscle Physiology, Respiratory System Anatomy and Physiology, Circulatory System Anatomy and Physiology, Digestive System, Urinary System, Genital System, Endocrine System, Nervous System, Sensory Organs Anatomy and Physiology.

ATA103 ATATÜRK PRINCIPLES AND HISTORY OF REVOLUTION I (2+0 AKTS: 2)

Basic concepts, definitions, description of course methods and resources, Industrial Revolution and French Revolution, The Disintegration of the Ottoman Empire (XIX. Century), Tanzimat and Reform Edict, I. and II. Constitutional Monarchy, World War I, Tripoli and Balkan Wars, Armistice Treaty of Mudros, Wilson Principles, Paris Conference, M. Kemal's departure to Samsun and the situation in Anatolia, Amasya Circular, National Congresses, Opening of the Parliamentary Assembly, Establishment of the Turkish Grand National Assembly and Internal Rebellions, Law on Organisation, Establishment of the Regular Army, I. II. İnönü, Kütahya-Eskişehir and Sakarya Battles and the Great Offensive, Treaties during the War of Independence, Lausanne Peace Treaty, Abolition of the Sultanate

INGU103 ENGLISH I (2+0 2 AKTS: 2)

Introduction, verb to be, subject pronouns, demonstrative pronouns, countable/uncountable nouns, quantifiers, simple present tense, adverbs of frequency, object pronouns, possessive adjectives, have got/has got, should, - (must/mustn't), -ebilmek, -abilmek (can/can't), Simple Past Tense, Unit review (Units 1-7), Present tense, Conjunctions (and-but-therefore-because), Comparisons, Unit review (Units 9-11), General review.

TURK103 TURKISH LANGUAGE I (2+0 2 AKTS: 2)

Oral presentation studies, What is language; world languages, the place and historical development of Turkish among them, Problems of Turkish today with current texts, Spelling of 'de', 'ki' and 'mi' with current texts, Problems related to the spelling of Turkish words (compound) with compiled texts, Text analysis: Analysing an article with scientific content, Applications related to spelling rules and punctuation marks, Text analysis: Analysis of a column, Expression disorders, language mistakes and applications, Turkish as the language of science with sample texts, Oral presentation studies.

RTR103 RADIATION PHYSICS

Introduction to Radiation Physics, Matter and Atomic Structure, Radiation Concept - Ionising and Non-Ionising Radiation, Electromagnetic Spectrum, Radioactivity Concept and Radioactive Decays, Properties of X-Ray and Obtaining X-Ray Tube, Interaction of X-Ray with Matter, Attenuation Concept, Radiation Dose Units, Basic Principles of Radiation Protection,

RTR111 INTRODUCTION TO RADIOTHERAPY

Cancer and its Causes, Cancer Spread Pathways, Characteristics of Cancer Cells Treatment Methods used in Radiation Oncology, Fraction Concept and Immobilisation Methods, Treatment Planning in Radiotherapy, Target Volume Concept in Radiotherapy, Radiation Sensitivity of Tissues, Possible Side Effects of Radiotherapy, Brachytherapy, Linear Accelerators, Tomotherapy, Communication with Patient in Radiotherapy

RPSI209 POSITIVE PSYCHOLOGY AND COMMUNICATION SKILLS

Definition, basic concepts, theoretical foundations and applications of positive psychology, emotional experience and behaviour, examining brain behaviour systems of emotional experience and behaviour, self and others

recognition, psychosocial life skills and problem solving skills, motivation and planning, anger, aggression, violence, anger, aggression, violence, relationship management, healthy decision making, persistence and compromise.

RKUL103 UNIVERSITY CULTURE I (0+2 ACTS: 4)

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

II. SEMESTER

ATA104 ATATÜRK PRINCIPLES AND HISTORY OF REVOLUTION II (2+0 AKTS: 2)

Lausanne Peace Treaty and its Evaluation, Revolutions in the Political Field, Proclamation of the Republic and Abolition of the Caliphate, Attempts to Transition to Multi-Party Political Life, Revolutions in the Field of Law, Revolutions in the Social Field, Revolutions in the Field of Education and Economy, Turkish Foreign Policy between 1923-1938, Turkish Foreign Policy between 1938-1950, Democrat Party Government and Adnan Menderes Period (1950 - 1960), 1960 Government Coup and Political Developments Afterwards, 1980-2002 Period Domestic Politics of Turkey, Basic Principles of Turkish Revolution (Atatürk's Principles and Complementary Principles), Atatürk's Revolutions, Rationalism and Scientific Thought; Republicanism and Populism, Nationalism and Statism; Secularism and Revolutionism.

INGU104 ENGLISH II (2+0 AKTS: 2)

Demonstrative Pronouns, Possessive Pronouns, Past Continuous Tense, Reading and vocabulary exercises (Simple Past Tense & Past Continuous Tense), Preposition of Time and Place, Present Perfect Tense, General Review (units 1-5), Possessive 's', Adverbs of manner, Future Tense, Making Suggestions & Requests, Gerunds - Infinitives, Modals (must, should, have to, don't have to, may), General Review (units 7-12).

TURK104 TURKISH LANGUAGE II (2+0 AKTS: 2)

The word and its meaning, words in terms of their meanings, literal, colloquial and metaphorical meanings of words, idioms, idioms, terms, language mistakes, sentence structure of Turkish, sentence elements, sentence analyses, types of written expression such as novel, article, essay, poem, presentation, report and report samples, petition, business letter and CV writing, mutual speech and discussion

RTR100 IMAGING METHODS IN RADIOTHERAPY

Introduction to Radiation Concept, Medical Radiation and Usage Areas, X-ray radiography, Mammography, Small intestine and colon radiography, Contrast agents, USG, Computed Tomography (CT) Physics and Basic Principles, Magnetic Resonance Imaging (MR) Physics and Basic Principles, Angiography, Nuclear Medicine, Radiation Protection of Medical Radiation Employees

RTR118 DEVICES USED IN RADIOTHERAPY

Overview of the devices used, Technical features and use of CT Simulator device, Technical features and use of CT device in radiotherapy, Technical features and use of MRI device in radiotherapy, Technical features and use of PET device in radiotherapy, Technical features and use of linear accelerator device in radiotherapy-I, Technical features of linear accelerator device and its use in radiotherapy- II, Technical features and use of intraoperative radiotherapy device, Technical features and use of Brachytherapy device and its use in radiotherapy, Technical features of Gamma Knife device and its use in radiotherapy, Technical features of Cyber Knife device and its use in radiotherapy, Technical features of Tomotherapy device and its use in radiotherapy.

MYO015 SOCIAL RESPONSIBILITY PROJECT (ELECTIVE COURSE)

Basic concepts of society and community service practices and social responsibility projects, The importance of community service practices and social responsibility projects, Determining the Target Audience Problem, Producing solutions to the problems identified, Today's community service practices: Community service practices and social responsibility projects of public institutions and non-governmental organisations,

Researching community service practices and social responsibility projects in our city, Organising panels, conferences, information seminars, Volunteering in various projects within the framework of Social Responsibility

RTR114 BIOLOGICAL EFFECTS OF RADIATION (3+0 AKTS:5)

Introduction, General information about radiobiology, Cell Structure and Organelles, DNA Structure and Replication, Effects of Radiation at Cellular Level, Effects of Radiation at Molecular Level, Dose Concept, Radiation Dose Concept, Radiation Workers and Community Doses, Biological Half-Life, Effective Half-Life Calculations, Radiation Hypersensitive Cells and Sensitivity Event Chain, Radiation Sensitivity of Tissues and Organs, Early Period Effects of Radiation, Late Period Effects of Radiation, Epidemiological Studies, Radiation Accidents and Biological Effects Depending on the Degree of Dose; Changes in Blood Values, Vomiting, Nausea, Mortality, Genetic risks, Chromosome abnormalities, Radiation Damage and Repair Events, Basic Principles of Radiation Protection

RKUL104 UNIVERSITY CULTURE II (0+2 AKTS: 4)

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

TLT107 GENERAL PATHOLOGY

Tissues, Follow-up of Tissues, Staining Methods, Cell Damage and Adaptation, Cell Death, Inflammation and Wound Healing, Acute and chronic inflammation, general pathological features of infectious diseases, tissue regeneration, naming of tumours and Neoplasms constitute the general content of the course.

III. SEMESTER

TGT217 RADIOLOGICAL ANATOMY

Introduction to anatomy. Axes, planes, general information. Basic concepts in radiological anatomy. Anatomical structures and radiological anatomy of the upper extremity Anatomical structures and radiological anatomy of the lower extremity. Myologia and radiological anatomy, Columna vertebralis anatomical structures, Head-neck anatomical structures, Cerebral hemispheres and anatomical structures, Cerebral hemispheres, Cerebral hemispheres and anatomical structures, Brain stem and medulla spinalis, anatomical structures, Thorax, Abdomen, Pelvis-Female genital organs, Pelvis-Male genital organs.

RTR229 RADIOTHERAPY APPLICATIONS

Working principle of Linear Accelerators, Devices used in radiotherapy, IGRT application methods, Linak based treatment applications: 3DCRT-VMAT-SRS and SBRT, Robotic Radiosurgery applications, Tomotherapy Applications, Brachytherapy Applications, Mobile tumour treatment, Plan quality assurance test applications.

RTR227 CLINICAL RADIATION ONCOLOGY I

Students can distinguish between health and disease. Knows the functions of body organs and systems. Knows the concept of cancer. Recognise the methods used in cancer diagnosis. Have knowledge about all types of cancer. Recognise the methods used in cancer treatment. Knows the concept of radiotherapy. Introduction to Clinical Radiation Oncology, What is Cancer? Incidence Distributions, Factors Causing Cancer, Cancer Treatment Methods, Head-neck, brain tm. oncological approaches, GIS tm. Oncological approaches, Lung cancers Oncological approaches, Skin cancers Oncological approaches, Pancreatic, Gallbladder Cancer, Metastatic tumours, Soft tissue tumours, Breast tumours, Urological tumours, Gynaecological tumours, Childhood tumours, Lymphoma

RTR223 TREATMENT PROCESSES IN RADIOTHERAPY

Introduction to radiotherapy, Radiotherapy preparation process, patient preparation and information, Immobilisation in radiotherapy, Imaging and simulation for radiotherapy: Computed Tomography, Respiratory organ movements and ITV concept, Target and critical structure contouring, Treatment planning: 3DCRT-IMRT-Vmat-SRS and SBRT, Examples of treatment plans, Patient-based quality control and delivery of treatment

TGT215 NUCLEAR MEDICINE (3+0 AKTS: 5)

Introduction to Nuclear Medicine, Atom and Structure, Radioactivity, Halvings, Radiation, Electromagnetic Spectrum, Alpha, Beta, Gamma Decays, Interaction of Radiation with Matter and Radiation Protection, Nuclear Medicine Imaging Device Structure, Gamma Cameras, PET, Radiopharmaceuticals, Quality Control in Nuclear Medicine, Patient Preparation and Patient Positioning, Bone Scintigraphy, Bone Mineral Density Measurement application, Thyroid Scintigraphy, Thyroid Uptake Test application, Positron Emission Tomography / CT Imaging (18F FDG), Brain PET / CT Imaging with F18 FDG, Brain Death, Scintimamography, Prosta Scan-PSMA, PET / MR Applications.

IV. SEMESTER

RTR210 CLINICAL RADIATION ONCOLOGY II

Students can distinguish between health and disease. Knows the functions of body organs and systems. Knows the concept of cancer. Recognise the methods used in cancer diagnosis. Have knowledge about all types of cancer. 'Recognises the methods used in cancer treatment. Knows the concept of radiotherapy'. Childhood Cancers (Wilms Tumour and Neuroblastoma, Rhabdomyosarcoma), Bladder, Rectum, Prostate, Cervical Cancer, Brain Tumours, Bone Metastasis, Lymphoma, Leukaemia and Plasma Cell Tumours, Thyroid Cancer, Palliative Radiotherapy

RTR220 PATIENT CARE METHODS

Basic Concepts in Patient Care, Health and disease concepts-definitions, Safe hospital environment, Vital signs; Fever, Pulse, Arterial Blood Pressure, Respiration and Vital Signs Monitoring, Hot-Cold Applications, Hospital infections and individual hygiene-care, Isolation-asepsis-antiseptics-sterilisation-disinfection, Massage and Applications-Decubitus (bed sore) formation and treatment, Nutrition Fluid-electrolyte, Acid - Base Balance and Imbalance, Patient Care in Radiotherapy Treatment, Drug preparation and drug administration methods, Parenteral Drug Administration and Intravenous Fluid Therapy, Patient care in chronic disease and terminal period

RTR216 QUALITY ASSURANCE AND QUALITY CONTROL IN RADIOTHERAPY

What is Quality Control (QA)? Why should we do Quality Control? Output concept and its importance, Simulator QA, Things to be considered in Linac QC, Set-up positions and IGRT applications, Intrafraction-Interfraction error sources, Comparative Set-up Methods, Brain- Head & Neck- Craniospinal Set-up errors, Set-up errors in Thorax & Breast Irradiation, Set-up errors in Upper-Lower Abdomen and Pelvis Irradiation, Set-up errors in SRS and SBRT treatments

ILK101 FIRST AID

General First Aid Information, Human Body, Patient / Injured and Crime Scene Assessment, Basic Life Support, Respiratory Tract Obstructions, Bleeding and Shock, Injuries, Burns, Frostbite, Heat Stroke, Consciousness Disorders (Loss of Consciousness, Convulsions, Low Blood Sugar, Chest Pain), Poisoning, Animal Bites, Foreign Objects in the Eye-Ear-Nose, Drowning, Fractures, Dislocations, Sprains, Transport Techniques.

SAH101 HEALTH LAW

Introduction to health law, basic concepts and institutions of health law, patient rights and concepts, physician rights and concepts, privacy, enlightenment and consent in medical intervention, illegality of medical intervention, interventions without medical indication, legal nature of the relationship between hospital and patient, legal nature of the relationship between private hospitals and patients, legal nature of the relationship between public hospitals and patients, medical malpractice and compensation problems. Faulty medical practices and liability for compensation

RTR218 RADIATION SAFETY AND PROTECTION

Historical development in radiation protection, Cell structures and working system, Units used in radiation measurement, Risk calculation in radiation exposure, Measuring devices used in radiation protection, Radiation

accidents and biological dosimetry, Dosimetry, Collection and neutralisation of radioactive sources, Armouring in radiology and nuclear medicine devices, Armouring calculations in radiology devices, Armouring calculations in radiology devices, Sample problems in radiology devices, Fetus doses in radiology, nuclear medicine and radiotherapy, Legal status in radiation protection in Turkey.