CONTENT OF PRACTICAL CLASSES
ON THE DISCIPLINE
«MODERN TECHNOLOGIES IN DENTISTRY»
FOR FIRST-YEAR STUDENTS
DENTISTRY. INSTITUTE OF DENTISTRY
2ST SEMESTER OF THE 2024/2025 ACADEMIC YEAR

Topic 1. Application of modern technologies in Dentistry

Lesson № 1

Topic: «Physical methods of sanitary and hygienic processing of dental instruments »

1. Types of sanitary and hygienic treatment of instruments.
2. Physical basis for the application of methods of sanitary and hygienic processing.
3. Laboratory work «Comparison of various methods of sanitary and hygienic processing of dental instruments».

Lesson № 2

Topic: «Ultrasonic Dental Devises and Apparatus»

1. Features of the propagation of ultrasonic radiation.
2. The biological effect of ultrasound.
3. Features of the use of ultrasound radiation in dentistry, surface cleaning and sterilization.
4. Laboratory work «Calorimetric method for determining the useful power of an ultrasonic sterilizer».

Lesson № 3

Topic: «Laser Technologies in Dentistry»

1. Types of dental lasers and their main characteristics.
2. Physical principles of laser radiation application in caries diagnostics.
3. Mechanisms of laser cleaning and whitening of teeth using different types of lasers.
4. Physical and biophysical basics for the use of different types of dental lasers for the treatment of gums, soft, and hard tissues of teeth.
5. Laser Safety.

Lesson № 4

Topic: « Ionizing Introscopy in Dentistry: physical factors affecting image quality and radiation exposure»

1. Influence of voltage, current, exposure time, source-receiver and object-receiver distances on the optical density and contrast of images in dental radiography.
2. Dosimetry, radiation exposure, and methods of protection against ionizing radiation during the radiographic and computed tomography dental examinations.
3. Problem solving.

Lesson № 5

Topic: «Electrodiagnostics, electrophysiotherapy in dentistry»

1. Electric current. Direct and alternating electric current. Threshold values of the electric current.
2. Active and reactive resistance of the AC circuit. Total resistance (impedance). Frequency dependence of the impedance of biological tissues.
3. The use of direct and alternating current in dentistry. Electrophoresis. Electrodontometry. Apexlocator.
4. Laboratory work «Determination of the impedance".

Topic 2. Physical properties of materials in Dentistry

Lesson № 6

Topic: «Calculation of stressed and strained condition of teeth and dental prosthesis and appliances»

1. Elastic mechanical stresses and deformations.
2. The concept of gnathodynamometry.
3. Bending deflection
4. Computation of bridgelike prosthesis.
5. Dental implants.
6. Problem solving.

Lesson № 7

Topic: «Mechanical parameters of biological tissues»

1. Surface mechanical waves and method for their production.
2. Acoustic tissue analyzer and its principle of operation
3. Numerical parameters calculated from experimental data.
4. The use of numerical mechanical parameters of tissues in objective diagnostics in medicine.
5. The use of numerical mechanical parameters in dentistry.

Lesson № 8

Topic: « Optical and aesthetic properties of dental tissues and filling materials. Luminescent methods for analyzing hard and soft tissues of the oral cavity»

1. Optical properties of hard dental tissues and dental restoration materials.
2. The phenomena of reflection, refraction and absorption of light in the formation of color, shine, transparency and opalescence of tooth tissues.
3. Mechanisms of fluorescence of hard and soft tissues of the oral cavity. The influence of the degree of mineralization of enamel and dentin on their fluorescence spectra.
4. Fluorescence diagnostics in dentistry. Operating principles of devices designed for fluorescent diagnostics of various types of caries, tartar, and diseases of the soft tissues of the oral cavity.
5. Fluorescence of restorative dental materials.
6. Laboratory work «Registration of fluorescence of hard dental tissue samples»

Lesson № 9

Topic: «Colloquium: Modern Technologies in Dentistry»

Course control. Colloquium «Modern technologies in dentistry».

Approved at the meeting of the department
Head of department Machneva T.V.