Nutriciology
Elective for 4th year student of the Faculty of foreign students
Plan of practical classes

1.Physiology of digestion (2 hours)

Gastrointestinal tract: structure and functions, mechanisms of absorption and transport of nutrients, enzymes in digestion, regulation of the gastrointestinal tract.
Digestion in various parts of the gastrointestinal tract: in the oral cavity, stomach, small intestine.
Large intestine: functions of microflora, absorption of water and other nutrients.

2-3. Energy (4 hours)

Energy requirement. Components of energy costs. The main energy expenditure of the body.
Energy consumption during various types of activity (mental, physical, illness).
Basic energy balance (BMR), factors influencing BMR. Negative and positive energy balance.
Measurement of energy expenditure: direct and indirect calorimetry, other methods for measuring energy expenditure.
Calculation of the energy value of food. Calculation methods using formulas and online calculators.

4-9. Nutrients and their metabolism (12 hours)

Macroelements in food

Carbohydrates: structure and functions, monosaccharides, disaccharides and oligosaccharides, polysaccharides. Dietary fiber. The role of fiber in the digestion and absorption of food. Glucose absorption and glycemic index. International recommendations for carbohydrate and dietary fiber intake.

Lipids: structure and function, fatty acids, essential fatty acids, trans fatty acids, triglycerides, phospholipids, sphingolipids, alcohols, waxes, isoprenoids and steroids, synthetic lipids. International recommendations for lipid intake

Proteins: structure and functions, essential amino acids, nitrogen balance in the body. Protein metabolism.

Microelements, their role in the body
Vitamins: fat-soluble, water-soluble, absorption, transportation and storage, metabolism, functions, dietary intake, sources, symptoms of deficiency and excess.
Vitamin-like factors: metabolism, functions, dietary intake, sources, symptoms of deficiency and excess.

Minerals, general characteristics, functions, food sources. Mineral composition of the body.
Calcium, phosphorus, magnesium, sulfur: absorption, transportation, storage and excretion, functions, sources, recommended dietary intake, symptoms of deficiency and excess.
Iron, zinc, fluorine, copper: absorption, transportation, storage and excretion, functions, sources and recommended dietary intake, symptoms of deficiency and excess.
Iodine, selenium, manganese, chromium, molybdenum, boron, cobalt: functions, sources and recommended dietary intake, symptoms of deficiency and excess.

10. Imbalance in nutrition (2 hours)

State of malnutrition, malnutrition, cachexia.
Overeating, excess body weight, general disorder of fat metabolism.

11-12. Nutrition assessment (4 hours)

Diet-related risk factors.
Tools for assessing nutritional status: life history, diseases, medications. Social history, food history. Nutrient intake analysis. Physical and functional assessment (anthropometry, body mass index, bioelectrical impedance analysis).

Nutrition screening (Universal Nutrition Screening Tool (MUST), Mini Nutritional Assessment (MNA), GNRI), Gastrointestinal functions: malabsorption syndrome, hand dynamometry, hydration (dehydration, overhydration), assessment of physical activity (questionnaire for assessing physical activity), subjective overall assessment.

13. Water, electrolyte and acid-base balance (2 hours)

Water in the body: functions, distribution.
Water balance: hormonal regulation, water consumption, water intoxication, removal of water from the body.
Electrolytes: Normal serum electrolyte concentrations.
Acid-base balance: regulation, disorders (metabolic acidosis, metabolic alkalosis, respiratory acidosis, respiratory alkalosis), compensation.
Possibilities of diet therapy in correcting water, electrolyte and acid-base balance.

14-15. Nutrition during life cycle (4 hours)

Nutrition during pregnancy and lactation.
Nutrition in infancy, childhood, adolescence.
Nutrition in adulthood.
Nutrition in old age.
Nutrition to maintain health and fitness.
Nutrition for eating disorders.

16-20. Medical nutrition (10 hours)

Therapeutic nutrition for adverse reactions to food: food allergies and intolerance to food components.
Medical nutrition for diseases of the gastrointestinal tract, diseases of the hepatobiliary system and pancreas. Enteral and parenteral nutrition.
Therapeutic nutrition for diseases of the endocrine system.
Therapeutic nutrition for anemia.
Therapeutic nutrition for cardiovascular diseases.
Therapeutic nutrition for lung diseases.
Therapeutic nutrition for kidney diseases.
Therapeutic nutrition for oncological diseases, surgical interventions, burns, injuries.

1. **Vitamins – the benefits and harms.**
2. **Diseases associated with deficiency of minerals in the body.**
3. **Features of nutrition of persons engaged in mental and physical labor.**
4. **The most absurd diets.**
5. **Milk: reality and myths.**
6. **Red and white wine, traditions of use, benefit and harm.**
7. **Nutrition of children in organized groups. What would you save and change?**
8. **Food quality and its impact on public health.**
9. **What do we know about water?**
10. **Chocolate in the human diet.**
11. **Vegetarianism: pros and cons.**
12. **Radionuclides in food, impact on human health.**
13. **Psychological aspects of human nutrition.**
14. **Diseases associated with nutrition.**
15. **Nutrition during pregnancy and breastfeeding.**
16. **Food traditions in different countries.**