PROGRAM

Biology for preparing year foreign students in Medicine, Dental Medicine and Pharmacy

Accepted by a Section Council on 21.10.2019 r.
Course name:
Biology for preparing year foreign students in Medicine, Dental Medicine and Pharmacy

Type of course according to the Uniform State Requirements:
Mandatory

Level of Education:
Preparatory course

Form of Education:
Lecture exercises, Seminars

Duration of the education:
Two semesters, 27 weeks

Auditorium classes:
170 hours

Technical equipment applied in the training:
Multimedia presentations, anatomical skeleton, Anatomy atlases, drawings, tests, specialized dictionaries with medical and biological terminology.

Control and evaluation:
- Ongoing evaluation – weekly tests, oral examinations, colloquium
- Final evaluation – combined written test.

Formation of the final grade:
The final grade is based on the mark from the final combined test exam.

Aspects in the formation of the final grade:
Participation in seminars, results from test exams, colloquium and final exam

Semester exam:
Yes/Written examination

State exam:
No

Lecturer:
Leading teacher from Natural Sciences section

Section: Natural Sciences
ANOTATION

The discipline Biology allows students from preparatory course to acquire knowledge and skills in the following basic biological concepts:
- selected and adapted minimum of medical and biological terminology
- scientific vocabulary in disciplines cytology, histology, anatomy, physiology, molecular and cell biology, immunological homeostasis
The following methods of education are used:
- Methods for building verbal communication skills using medical-biological terminology and scientific vocabulary
- Methods for control and evaluation of the knowledge
- Methods of communicative competence of the disciplines studied
- Inductive, deductive, interdisciplinary and integral approach
- Motivational approach

COURSE TASKS

The main tasks of the curriculum are determined by the program and content of the medical and biological disciplines studied in the first and second year in Medicine, Dental Medicine and Pharmacy. The aim is to acquire the knowledge and skills needed in the next level of training. The tasks are as follows:
- Undergraduate level of biology knowledge in English to enable students to participate fully in the initial stage of the educational process in the respective faculty
- A free use of biological terminology in English and understanding the specifics of the scientific style
- Professional orientation training
- Education in humane principles
- Targeted education of friendly relationships in order to increase the effectiveness of the learning process

OBLIGATORY COMPETENCIES

1. Theoretical knowledge:
- to have communicative competence and to be able to apply knowledge in order to understand the information in first and second year of education
- to be able to understand and analyze the medical and biological texts in English on the disciplines studied
- to know and apply modern methods and tools for biology education
- to know and apply methods for their personal improvement
- to know and use the scientific style in the medical-biological disciplines studied
- to cover the exam and test requirements

CURRICULUM

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<th>Type of courses</th>
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<td>52 Replication – Biosynthesis of DNA</td>
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<td>58 Viruses – Agents of Diseases</td>
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<td>59 Prokaryotic Cells – Structure and Functions</td>
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<td>62 Providing the Cell with Proteins</td>
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<td>63 Taking Particles and Secretion</td>
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<td>64 Providing the Cell with Energy</td>
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<td>65 Providing the Cell with a Program for Existence</td>
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<td>66 Chromosomes – Carriers of the Cell Program</td>
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<td>72 Meiosis</td>
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<td>76 Parasitism. Relationships between the Parasite and the Host. Parasite and Host Types.</td>
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LECTURE EXERCISE COURSE SYNOPSIS
2019/2020

I SEMESTER - 11 WEEKS

LESSON 1 – 2 hours. Introductory Course. Cell 1

LESSON 2 – 2 hours. Introductory Course. Cell 2

LESSON 3 – 2 hours. Introductory Course. Organs and Systems 1

LESSON 4 – 2 hours. Introductory Course. Organs and Systems 2
Respiratory system, Excretory system, Reproductive system, Nervous system – terminology.

LESSON 5 – 2 hours. Introductory Course. Organism Properties - Life Processes
Feeding (Nutrition), Respiration, Excretion, Growth, Reproduction, Movement, Responsiveness, Variation, Heredity – definitions.

LESSON 6 – 2 hours. Introductory Course. Exercises

LESSON 7 – 2 hours. Introductory Course. Relationships between the Organisms
Symbiosis, Synnecrosis, Commensalism, Amensalism, Parasitism, Mutualism – definitions, examples.

LESSON 8 – 2 hours. Introductory Course. Exercises

LESSON 9 – 2 hours. Introductory Course. Seminar

LESSON 10 – 2 hours. Introductory Course. Test № 1

LESSON 11 – 2 hours. Tissues. Tissue Types: epithelial, connective, muscle, nervous. Characteristics, classification, functions


LESSON 12 – 2 hours. Skin. Structure and Functions. Thermoregulation


LESSON 13 – 2 hours. Locomotive System. Skeleton. Bones of the Skull


LESSON 14 – 2 hours. Bones of the Trunk. Vertebral Column. Rib Cage


LESSON 15 – 2 hours. Bones of the Limbs


LESSON 16 – 2 hours. Skeletal Muscles


LESSON 17 – 2 hours. Locomotive System and Health.

Locomotive System and Health. Scoliosis, discopathy, splayfoot, osteoporosis.

LESSON 18 – 2 hours. Exercises and Preparation for a Test


LESSON 19 – 2 hours. Test № 2

LESSON 20 – 2 hours. Cardiovascular system. Internal Body Fluids. Blood

LESSON 21 – 2 hours. Blood Groups

LESSON 22 – 2 hours. Heart and Blood Vessels. Systemic and Pulmonary Circulation

LESSON 23 – 2 hours. Cardiovascular System and Health

LESSON 24 – 2 hours. Exercises and Preparation for a Test

LESSON 25 – 2 hours. Test № 3


LESSON 28 – 2 hours. Digestive System and Health

LESSON 29 – 2 hours. Excretory System. Structure and Functions of the Excretory Organs. Urine Production

LESSON 30 – 2 hours. Excretory System and Health

LESSON 31– 2 hours. Respiratory System. Structure and Functions of the Respiratory Organs

LESSON 32 – 2 hours. Respiratory System and Health

LESSON 33 – 2 hours. Seminar
Skin, locomotive, cardiovascular, digestive, respiratory and excretory systems.

LESSON 34 – 2 hours. Test № 4
Digestive, respiratory and excretory systems.

II SEMESTER – 16 WEEKS

LESSON 35 – 2 hours. Reproductive System. Male and Female Reproductive System – Structure and Functions
Male reproductive system: Testes, sperm ducts, seminal vesicles, prostate gland, penis – structure and function. Erection and ejaculation.

LESSON 36 – 2 hours. Reproductive System. Female Reproductive System. Sexual and Reproductive Health

LESSON 37 – 2 hours. Exercises and Preparation for a Colloquium
Tissues. Skin. Locomotive, cardiovascular, digestive, respiratory, excretory, male and female reproductive systems.

LESSON 38 – 2 hours. Colloquium
Tissues. Skin. Locomotive, cardiovascular, digestive, respiratory, excretory, male and female reproductive systems.


LESSON 42 – 2 hours. Brain – Structure and Functions

LESSON 43 – 2 hours. Spinal Cord – Structure and Functions

LESSON 44 – 2 hours. Sensory Systems. Visual Sensory System
General structure and functions of the sensory systems: sensory organs, nerves and areas. Visual sensory system. Human eye – structure and function.

LESSON 45 – 2 hours. Sensory Systems. Auditory, vestibular, kinesthetic, olfactory, gustatory, somatosensory system

LESSON 46 – 2 hours. Seminar
Reproductive, endocrine and nervous systems. Sensory systems.

LESSON 47 – 2 hours. Test № 5
Endocrine and nervous system. Sensory systems.

LESSON 48 – 2 hours. Chemical Composition of the Cell. Proteins and Polypeptide Chains

LESSON 49 – 2 hours. Structure and Properties of Proteins
Protein structure: amino acids, polypeptide chains. Levels of organization of proteins: primary, secondary, tertiary and quaternary structure. Protein functions: structural, catalytic, regulative, transport, active and passive protective and contractile. Protein properties: denaturation and renaturation

LESSON 50 – 2 hours. Nucleic Acids. Deoxyribonucleic Acid

LESSON 51 – 2 hours. Ribonucleic Acid

LESSON 52 – 2 hours. Replication – Biosynthesis of DNA

LESSON 53 – 2 hours. Transcription – Biosynthesis of RNA

LESSON 54 – 2 hours. Translation – Biosynthesis of Proteins

LESSON 55 – 2 hours. Exercises and Preparation for a Test
Proteins and nucleic acids – structure, properties and functions. Replication, transcription, translation.

LESSON 56 – 2 hours. Test № 6
Proteins and nucleic acids – structure, properties and functions. Replication, transcription, translation.

LESSON 57 – 2 hours. Viruses and Phages

LESSON 58 – 2 hours. Viruses – Agents of Diseases

LESSON 59 – 2 hours. Prokaryotic Cells – Structure and Functions

LESSON 60 – 2 hours. Organization of Eukaryotic Cells

LESSON 61 – 3 hours. Exchange of Substances between Cell and Environment

LESSON 62 – 2 hours. Providing the Cell with Proteins

LESSON 63 – 2 hours. Taking Particles and Secretion

LESSON 64 – 3 hours. Providing the Cell with Energy

LESSON 65 – 2 hours. Providing the Cell with a Program for Existence

LESSON 66 – 2 hours. Chromosomes – Carriers of the Cell Program


LESSON 68 – 2 hours. Exercises and Preparation for a Test

LESSON 69 – 2 hours. Test № 7

LESSON 70 – 3 hours. Cell Cycle

LESSON 71 – 2 hours. Cell Division. Mitosis

LESSON 72 – 2 hours. Meiosis

LESSON 73 – 3 hours. Exercises and Preparation for the Entrance Exam
Exercises on test 1 and test 2

LESSON 74 – 2 hours. Exercises and Preparation for the Entrance Exam
Exercises on test 3 and test 4

LESSON 75 – 2 hours. Exercises and Preparation for the Entrance Exam
Exercises on test 5 and test 6


Immune system. Primary and secondary immune response. Phases of the immune response: cognitive, activation and effector phase. Innate and acquired immunity. Organs of
the immune system: primary (bone marrow and thymus) and secondary (spleen, lymph nodes, MALT).

**LESSON 78 – 2 hours. Cells of the Immune Response. Antigens and Antibodies**

**LESSON 79 – 3 hours. Seminar**
Molecular and cell biology. Parasitism. Immune system.

**LESSON 80 – 2 hours. Test № 8**

**LESSON 81 – 3 hours. Exercises and Preparation for the Final Exam**

**Recommended literature**
1. R. Bostandjieva, Tomova S., Komitska G., Gogov P. 2015, Biology and Health Education for the ninth grade
2. O. Dimitrov, Kozhuharova M., Argirova T., Bogoev V., Minkov I., Kimenov G., Slavova M., 2004, Biology and Health Education for the tenth grade

**Syllabus**
2. Skin. Structure and Functions. Thermoregulation
3. Locomotive System. Skeleton. Bones of the Skull
4. Bones of the Trunk. Vertebral Column. Rib Cage
5. Bones of the Limbs
6. Skeletal Muscles
7. Locomotive System and Health
8. Cardiovascular system. Internal Body Fluids. Blood
9. Blood Groups
10. Heart and Blood Vessels. Systemic and Pulmonary Circulation
11. Cardiovascular System and Health
16. Urine Production. Excretory System and Health
17. Respiratory System. Structure and Functions of the Respiratory Organs
18. Respiratory System and Health
20. Female Reproductive System – Structure and Functions. Sexual and Reproductive Health
24. Brain – Structure and Functions
25. Spinal Cord – Structure and Functions
27. Sensory Systems. Auditory, vestibular, kinesthetic, olfactory, gustatory, somatosensory system
28. Chemical Composition of the Cell. Proteins and Polypeptide Chains
29. Structure and Properties of Proteins
30. Nucleic Acids. Deoxyribonucleic Acid
31. Ribonucleic Acid
32. Replication – Biosynthesis of DNA
33. Transcription – Biosynthesis of RNA
34. Translation – Biosynthesis of Proteins
35. Viruses and Phages
36. Viruses – Agents of Diseases
37. Prokaryotic Cells – Structure and Functions
38. Organization of Eukaryotic Cells
39. Exchange of Substances between Cell and Environment
40. Providing the Cell with Proteins
41. Taking Particles and Secretion
42. Providing the Cell with Energy
43. Providing the Cell with a Program for Existence
44. Chromosomes – Carriers of the Cell Program
45. Cell Surface. Other cytoplasmic organelles
46. Cell Cycle
47. Cell Division. Mitosis
48. Meiosis
51. Cells of the Immune Response. Antigens and Antibodies
Test – sample Biology, Test 5, Variant 2

Name: ......................................................... Group: ............

I. Encircle the correct answer: max. 8 points

1. Rhythmical heart contracts and relaxes are caused by:
   a) nerves coming from the brain
   b) central nervous system
   c) special cardiac muscle cells
   d) nerves coming from the spinal cord

5. The cardiac muscles are supplied with blood through:
   a) aorta
   b) pulmonary veins
   c) coronary arteries
   d) pulmonary arteries

2. Which of the following is NOT correct:
   a) after lymph nodes the lymph is rich of erythrocytes
   b) the lymph vessels flow into blood vessels
   c) before the lymph nodes the lymph is like the tissue fluid
   d) a part of the tissue fluid enters the lymph capillaries

6. Pulmonary circulation starts with
   a) left ventricle and aorta
   b) left atrium and pulmonary vein
   c) right ventricle and pulmonary artery
   d) right atrium and vena cava

3. During the ventricle contraction:
   a) atrioventricular valves are open
   b) semi-lunar valves are closed
   c) atrioventricular valves are closed
   d) atrioventricular and semi-lunar valves are open

7. After interaction between Ag and Ab the result is:
   a) clot
   b) coagulation
   c) agglutination
   d) thrombus

4. Which of the following doesn’t lead to hypotension:
   a) atherosclerosis
   b) lack of enough liquids in the body
   c) improper diet and bad nutrition
   d) genetic factors

8. During the atrium contraction:
   a) atrioventricular valves are open
   b) semi-lunar valves are open
   c) atrioventricular and semi-lunar valves are closed
   d) atrioventricular and semi-lunar valves are open

II. Give brief answers for the following features of the heart: max. 11 points

- it has a size of a ....................................................
- three layers of the heart wall ........................................
- protective sac ...........................................................
- valves between atria and ventricles ...................................
- a blood vessel going out of the right ventricle .................
- a blood vessel entering the left atrium .............................

III. Write 3 types of internal extracellular body fluids (liquids): max. 3 points
   ........................................................................
   ........................................................................
   ........................................................................

IV. Write 3 types of blood vessels: max. 3 points
   ........................................................................
   ........................................................................
   ........................................................................
V. Write 5 diseases of cardiovascular system:       max. 5 points

VI. Describe the blood groups B, AB and Rh-:       max. 12 points

VII. Read the text carefully and fill in the gaps:    max. 10 points

VIII. Write the parts of the heart shown on the drawing:   max. 8 points

1. ........................................................................
2. ........................................................................
3. ........................................................................
4. ........................................................................
5. ........................................................................
6. ........................................................................
7. ........................................................................
8. ........................................................................