

Faculty of Medicine, Masaryk University, Brno

Syllabus of the subject matter required for the Admission Examination

BIOLOGY

General characteristics of living systems.

A brief survey of the classification system. Acellular, unicellular and multicellular organisms. Bacteria. Cyanobacteria. Medically important yeasts and molds. Plants. Medically important protozoa. Medically important worms and insects. Vertebrata. Mammals.

Cell biology.

Cell theory. Chemical composition of the cell. Structure and function of proteins. Structure and function of nucleic acids. Saccharides and lipids. Prokaryotic and eukaryotic cell – basic differences. Biomembranes and membrane organelles. Cytoskeletal system. Transport of small molecules into and out of the cell. Endocytosis and exocytosis. Energy transformation in mitochondria and chloroplasts. Transcription and translation. DNA replication. Structure of cell nucleus. Cell cycle. Mitosis. Cell differentiation.

Life functions in higher plants

Characteristic features of plant cells. Photosynthesis. Plant reproduction.

Life functions in higher animals

Homeostasis. Respiratory system. Cardiovascular system. Body fluids. Nutrition and digestion. Excretory system. Nervous system. Sensory functions. Hormonal regulation. Locomotion. Sexual reproduction. Embryonic development.

Genetics.

Heredity and variability. Gene and genotype. Allele. Homozygote and heterozygote. Character and phenotype, Dominance and recessivity. Gene and its expression. Prokaryotic and eukaryotic chromosomes. Meiosis. Segregation and recombination of chromosomes in diploid organisms. Mendel's laws. Mutations.

Evolution.

Origins of cells. Chemical evolution. Paleontological evidence of the earliest forms of life. Darwinian evolution.

Human biology.

Tissues of the human body. Skeleton and muscles. Respiratory system and its function. Blood. Blood groups and transfusion. Defense mechanisms. Circulatory system and its function. Lymph and its circulation. Digestive system and nutrition. Body temperature and its maintenance. Urinary system. Skin and its functions. Endocrine glands. Nervous system. Senses. Human reproduction and reproductive organs. Human development. Human genetics.

Ecology.

Abiotic and biotic factors. Biosphere. Ecosystems. Population explosion. Building of sustainable society.