

ABOUT THE ELECTIVE COURSE «BIOLOGICAL SYSTEMS» FOR HIGH SCHOOL STUDENTS

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In the context of profiling general secondary education in Ukraine, students in grades 10-11 have the opportunity to study in different profiles - for example, mathematical, biological, chemical, philological, etc. The content of the training profile is implemented by a system of separate subjects and courses: basic and selective subjects, which are given at the general level, specialized (profile) subjects studied at the profile level, and optional courses [1].

We have developed an elective course in biology «Biological systems» for students of 10-11 grades [2]. The aim of the course is to create the conditions for self-identification of the individual and to formate biological and key competences of high school students, develop students interest in biology, as well as modern technologies and activities related to the research and use of biosystems. The main objectives of the course «Biological systems» include:

- enable students to learn about their abilities and meet cognitive needs;
- to broaden and systematize the knowledge of high school students about the structure, functioning and diversity of biological systems;
- to ensure development of research, project, creative, reflective skills, improvement of self-education skills, productive cooperation with others;
- develop students' willingness and ability to discuss socially significant issues, make ethically sound decisions, and act responsibly on biosystems;
- to create a motivational basis for students to make a conscious choice for further learning.

The course content consists of four topics: «Structure and Functioning of biological systems», «Biosystems research», «Biological systems and scientific and technical progress», «Protection and conservation of biological systems». The study material on the structural and functional organization of biological systems, methods of study, fields of their application covers three aspects of the study of these objects: theoretical, practical and predictive. The theoretical aspect concerns the basic parameters of biosystems (structure, functions, development, interconnections with the environment), properties (self-regulation, self-organization) and the diversity of natural biological systems. The ways of using these theoretical knowledge in practical activity today and in the near future constitute a practical aspect of the content of the course. It is conditioned by educational information on creation of functional biological tissues, innovative products of biotechnology and artificial biosystems, for example in vitro technology, usage of different biosystems (organisms, populations) for environmental quality assessment, development of biosystems with managed microclimate etc. All these directions of research could solve several environmental and nutritional problems in Ukraine and worldwide by

providing the population with quality food in sufficient quantities. The prognostic aspect provides material on predicting the potential consequences of human intervention in biological systems, their transformation and use (like predicting the effects of human destructive influence on the biosphere and its ecosystems in order to prevent them).

In order to effectively master the course «Biological systems» it is advisable to organize various activities for students: research, analysis, systematization and presentation of information on biosystems; carrying out research and projects individually or in a group; participation in discussions on specific issues (identified by students); preparation of presentations on the studied issues; reflection of own activity. High school students have the right to choose the topic of messages and projects, the form of their presentation, partners for group tasks.

References

1. Наказ МОН від 20.04.2018 №408 «Прозатвердження типової освітньої програми закладів загальної середньої освіти III ступеня». [Електронний ресурс]. URL: <https://mon.gov.ua/ua/npa/prozatverdzhennya-tipovoyi-osvitnoyi-programi-zakladiv-zagalnoyi-serednoyi-osviti-iii-stupenya-408>
2. Коршевнюк Т. Навчальна програма курсу за вибором «Біологічні системи. 10-11 класи» // Біологія і хімія в рідній школі. – 2020. – № 1. – С. 22-25.