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CONTENT

BIOLOGICAL SCIENCES. ECOLOGY

Грідіна І.Р., Бендас С.І., Чернадчук С.С.

Дія тіохрому на стан вільнорадикальних процесів в печінці щурів із парацетамоловою інтоксикацією 4

Хоменко О.М., Камінська М.Б.

Аналіз вмісту радону-222 у питній воді України 7

PEDAGOGY AND PSYCHOLOGY

Serhii Onyshchenko

End-to-End Programs of Classes for Energy Profile Students During Internship at Energy Enterprises 10

Rodion Yahotin, Hanna Yahotina

Particularities of Psychomotor Development of Children of Primary School 13

Охромій Г.В., Мироненко А.О.

Оптимізована модель психологічної корекції професійних страхів у працівників рятувальних підрозділів з надзвичайних ситуацій 16

Хроленко М.В., Бурчак Т.С., Школа Р.В.

Деякі аспекти екологічної освіти і виховання учнівської молоді 19

MODERN TECHNOLOGIES

Alla Vlasiuk

Innovative Learning Technologies 21

PEDAGOGY AND PSYCHOLOGY

**END-TO-END PROGRAMS OF CLASSES FOR ENERGY PROFILE STUDENTS
DURING INTERNSHIP AT ENERGY ENTERPRISES**

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The Department of Vocational Education, Labor Training and Technology of Berdyansk State Pedagogical University has developed end-to-end training programs for students in the energy sector during internships at energy enterprises. As an example, we will give an end-to-end program of classes for students of specialty 015.33 Professional education (Power engineering, electrical engineering and electrical engineering) at energy enterprises in Ukraine during their university studies, the purpose of which is to improve the quality of training of specialists by studying by students the operating modes and features of the operation of modern high-voltage electrical equipment directly at production. Participation in the training of students by highly qualified specialists from energy system enterprises will help solve the problem of the quality of teaching energy disciplines.

As a result of classes at energy system enterprises, students of the profile “Power Engineering, Electrical Engineering and Electromechanics” should know:

- principles of organization and features of the functioning of the electric power system; composition and structure of the Ukrainian energy system;
- methods of producing electrical energy at thermal and hydraulic power plants; structural diagrams of power plants;
- types of high-voltage electrical equipment of power stations and substations, features of its operation;
- methods of transmitting electrical energy at various rated voltages; types and schematic diagrams of substations; types and diagrams of substation switchgears;
- types and types of insulating structures of high voltage electrical equipment; methods of protecting electrical installations from direct lightning strikes and lightning waves and internal overvoltage’s affecting the insulation;
- environmental aspects of high voltage electrical installations; electromagnetic compatibility issues in high voltage installations; methods of labor protection and ensuring personnel safety when working in electrical installations.

Must be able to:

- read electrical diagrams of electrical installations, switchgear of substations, evaluate these diagrams from the point of view of operational reliability and safety of personnel;
- determine the types of insulation of high voltage electrical equipment; assess the compliance of the levels of electrical insulation strength and the levels of impact overvoltages;

- determine and evaluate methods of lightning protection and protection from incoming overvoltage waves, methods of grounding and ensuring electrical safety in electrical installations.

Must have the skill: behavior during classes at electrical power facilities; reading electrical diagrams; analysis of the design of switchgears; determining the purpose and types of equipment by appearance.

Currently, this program is being implemented almost in full.

The knowledge, skills and abilities acquired by students in classes at energy system enterprises are consolidated and applied in industrial practice (after the 6th semester) and in pre-graduation practice (after the 7th semester).

When compiling assignments for practice, it is necessary to take into account previously completed disciplines, as well as include in the assignments questions the consideration of which will contribute to a better mastery of subsequent disciplines.

We consider it advisable to allocate in the training schedule of students of the Department of Vocational Education, Labor Training and Technology one day a week for an academic discipline in which lectures are given, practical and/or laboratory classes are conducted according to the scheme 2+2+4 or 2+4, or 2+2. In this case, classes at energy enterprises will be conducted during the day in the classroom, on the territory and in the workshops of the enterprise. At the same time, employees of the enterprise will study with students only during excursions and the demonstration part of laboratory work (from 1 to 2 hours); the rest of the time, classes with students will be conducted by teachers of the department.

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