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PECULIARITIES OF THE ELECTRONIC EDUCATIONAL AND METHODOLOGICAL COMPLEX UNDER THE POINT-RATING TECHNOLOGY

Olga Lyubova, Natalia Luybova

Abstract*: At present in the sphere of electronic learning in the light of solving tasks put by the Bologna Declaration an important place is being taken by electronic educational and methodological complexes (EMC).The authors have put forward new components of EMC necessary for the organization of educational process and for the determination of labour intensity according to modules and students' activity type. They also suggested a technology of defining the rating of the grade in the credit-module system.*

Keywords*: electronic educational and methodological complex, electrical engineering and electronics, point-rating technology and credit-module system*

Introduction

Electronic teaching today is an essential component in the organization of the study process. There are known electronic textbooks and multimedia author's courses [Zainutdinova, 1999], network courses on particular disciplines [Lyubova, 2004], virtual laboratories and electronic tests, electronic educational and methodological complexes (EMC), which start to be especially interesting after Russia's joining the Bologna process.

Main part

Tasks, set by the Bologna declaration, oriented on the unified educational space and creation of possibilities for flexible educational paths require new principles of the study process organization, its global computerization, starting from the formation of individual study plans. The key moment in the unified educational environment is the modularity of a curriculum and point-rating technology (PRT) of knowledge assessment comparable in different educational environments.

Elaboration of PRT principles at the example of generally professional discipline "Electrical engineering and electronics", as well as alterations connected with the introduction of this technology into a study process, have become the main task of the authors.

The basis of study process organization on curriculum disciplines is EMC, the components of which must be as follows:

- Working program;
- Course of lectures;
- Laboratory- based practical classes;
- Autonomous work;
- Tests for self-check;
- Literature;
- Glossary.

In the point-rating technology all EMC components must be oriented on modules of different types and levels. For the generally professional discipline it means the main and supportive module types of the basic and advanced level.

The basis of a new EMC must be represented by a module program which embodies the system of knowledge rating determination. With this end in view there is suggested a correspondence table of labour intensity in mastering the discipline main modules (in hours) and of points amount based on 100 points rating system (table1).

Table 1

Correspondence of labour intensity, credits and points amount based on modules and activity types.

№	Module name	Labour intensity, hours/credit units/points	Activity types, hours/points		
			Lectures	LPC	AW (training, CGW, CP,etc)
1	Basic concepts. Course structure. Analysis and calculation of electric circuits	36 1,0 22	8 4	11 5,5	8 CGW – 15 12,5
2	Three-phase circuits. Basic connections «Y» and «Δ»	36 1,0 8	6 3	10 5,0	8
3	Analysis and calculation of magnetic circuits. Transformers.	36 1,0 24	6 3	12 6,0	8 CP – 30 15
4	Kinds of electrical machines, their operating parameters and performance figures	36 1,0 9	8 4	10 5,0	8
5	Bases of electronics	26 0,72 7	6 3	8 4	8
	Total	170 / 4,72 70	34 17	51 25,5	40 45 27,5

Table 2

Correspondence of rating points to letter and number grades

Points	Letter Grades		Number grade
	USA	EU	Russia
96–100 91–95	A A–	A (exceptional)	5
88–90 84–87 81–83	B+ B B–	B (very good) C (good)	4
78–80 **74–77** 71–73	C+ C C–		
68–70 64–67 61–63	D+ D D–	D (satisfactorily) E (fair)	3
0–60	F	F	2; 1

According to the specialists' recommendations 30 points out of 100 points should be referred to a complex test or examination (in the traditional system), in that case students' current activity types will be assessed as 70 points. At the same time, it is recommended to assess the availability of lectures and their attendance as well as other

types of students' activities as 1 point for 2 hours. Attention should be paid to the correspondence of point-rating technology to other systems of assessing students' activity results (table 2).

In the context of the credit-module system "Labour intensity" column in table 1 is of interest – in terms of its correspondence to credit units or credits on the whole for a discipline according to a curriculum and singled out modules. One credit unit is assumed to be equal to 36 academic hours: 1 credit = credit unit = 36 hours.

Conclusion

Complex test as a new component of EMC requires further elaboration to comply with the level of achieving different competences.

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THE EXPERIENCE SOFTWARE-BASED DESIGN OF VIRTUAL MEDICAL INTRASCOPY SYSTEMS FOR SIMULATION STUDY

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Abstract*: The questions of software-based design of "virtual" technical systems are considered as facility of imitation experiment for educational purposes. These virtual systems are usable for analysis of medical intrascopy systems functioning. The virtual educational technical systems allow guarantee the goodness technical training of bioengineers.*

Keywords*: medical intrascopy systems, virtual technical systems, imitation experiment.*

ACM Classification Keywords*: K.3.2 Computer and Information Science Education — e-Learning Systems*

Introduction

Medical intrascopy systems are up-to-day technical systems, which allow get information about internal structure of human body. Principles of organization and functioning of this equipment are the barest necessity for biomedical engineers. These systems based at high technology of physics, electronics, applied mathematics and computer science. Moreover, these systems are unique, expensive and require radiation safety therefore engineer's training requires tentative explanation of principal modes of operation at simple virtual analogs. As virtual analog e-learning means can be used, because kernel of any intrascopy system is computer. The main difference between e-learning means and real technical system is availability of detector. E-learning means have the virtual detector of certain type. The type of virtual detector is determined by physical phenomena (ultrasound, x-ray etc). On conditions that virtual detector is adequate, then virtual intrascopy system' rest parts are similar to real system. The degree of virtual intrascopy system' adequacy depends on selection of presentation medium and software environment.