

Review of the subject curriculum

1. Are the learning outcomes and educational content appropriate for the developmental age of students?			
1 – inappropriate	2 – appropriate to a certain extent	3 – mostly appropriate	<u>4 – completely appropriate</u>
Please explain what should be modified if Your answer is 1, 2 or 3.			

2. Are the learning outcomes and educational content appropriate for the number of lessons?			
1 – inappropriate	2 – appropriate to a certain extent	<u>3 – mostly appropriate</u>	4 – completely appropriate
Please explain what should be modified if Your answer is 1, 2 or 3.			
<p>I suggested including introductory lesson or chapter “measurement” in the beginning of each starting course: in the 7th grade in primary school and in the 1st grade of secondary school (in each programme). It is of great importance to provide adequate experimental work later and to understand the limitations of physics as an experimental scientific discipline.</p> <p>The generic outcome »Examines physical phenomena« is not sufficient graduated in levels of achievement, from 7th class in the primary till the 4th class in the secondary school. The outcomes are sometimes repeating, we suggest changing it.</p>			

3. Are the learning outcomes and educational content relevant and based on scientific knowledge of the subject area?			
1 – no	2 – to a certain extent	3 - mostly	<u>4 – completely</u>
Please explain what should be modified if Your answer is 1, 2 or 3.			

4. Are the domains that are necessary for the subject area well represented?			
1 – no	2 – to a certain extent	3 - mostly	<u>4 – completely</u>
Please explain what should be modified if Your answer is 1, 2 or 3.			

5. Does the curriculum contain an adequate ratio of the breadth and depth of knowledge, skills, and attitudes in the subject area?			
1 – no	2 – to a certain extent	3 - mostly	<u>4 – completely</u>
Please explain what should be modified if Your answer is 1, 2 or 3.			

6. Does the curriculum, especially as regards the proposals in chapters F and G (Learning and teaching, Assessment), enable the acquisition of the listed learning outcomes?			
1 – no	2 – to a certain extent	<u>3 - mostly</u>	4 – completely
Please explain what should be modified if Your answer is 1, 2 or 3.			
The chapter »F« is written in too-general form. I suggest changing it in a way that it will be more helpful for teachers. It should explain the main ideas more in detail; and how to use the curriculum in the teaching practice.			

7. Are the proposed learning outcomes and other elements of the curriculum in line with the European and global recommendations?			
1 – no	2 – to a certain extent	3 - mostly	<u>4 – completely</u>
Please explain what should be modified if Your answer is 1, 2 or 3.			

8. Are the learning outcomes and educational content comparable with those in Your country?

Yes, they are comparable.

9. Please suggest other modifications if You consider them necessary.

The process of gaining grades is not part of the curriculum, however I suggest including some recommendations for teachers in the curriculum, which are specific for teaching physics.

Example:

- i) to define the final number of grades, regarding specific course (in dependence of amount of teaching hours per week or in the whole year),
- ii) to include the condition that not more than 50% of all grade can come from written tasks (but we suggest at least one grade form written task),
- iii) to suggest the alternatives how to gain grades beside the written or oral examination (presenting seminar works and posters, building and presenting experiments, research work, active and constructive collaboration in the teaching process, having results in national or international competitions etc. – define by yourself, what is adequate for Croatia).

I would like to commend the obviousness that curriculum encourages the teacher to focus on conceptual teaching, to set problem-oriented questions, to use ICT at teaching physics (ICT tools should not replace experimental work but supplement it) and to teach with enquiry (research approach). However, I suggest that you emphasize this in curriculum even more in order to avoid the overlooking by teacher.

ADDITIONAL RECOMMENDATIONS:

If possible, plane the laboratory experts employment in schools to help the physics (and other science subjects) teacher to prepare, conduct, maintain and storage experiments and equipment, e.g. one laboratory expert for all science subjects per school.

Correlations with other subjects (horizontal interconnectivity) are extreme problem at least in our country; I did not examine this part in the curriculum of physics from Croatia (no comparison with curriculums of other subjects) but I suggest reconsidering this, especially in connection with mathematics. More focus in teaching physics regarding solving exercises should be on building the physical solution (modelling) and not to the calculus part (actually – this can be considered as authentic problem for teaching mathematics, not physics). The correlations to other science subjects are also of great importance (e.g. biology, chemistry) and in sense of physics application the correlations with subjects, related with technique and technology.

In the curriculum stands that »the specified order of achieving learning outcomes within a particular grade is not mandatory«, which is good. Our experience is that the publishers, editors and authors of school textbooks strictly follow the order of content in curriculum, regardless this sentence. The teacher follows the order of contents in textbooks they use. Consequently is hard to ensure this kind of teacher's autonomy without interventions of the state in the process of preparing teaching materials.

10. Your conclusion about the proposed curriculum.

I can conclude that proposed curriculum is excellent. Moreover, there are some ideas provided which I suggest to include; and some recommendations, which can strongly improve the implementation of the curriculum in the teaching.



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