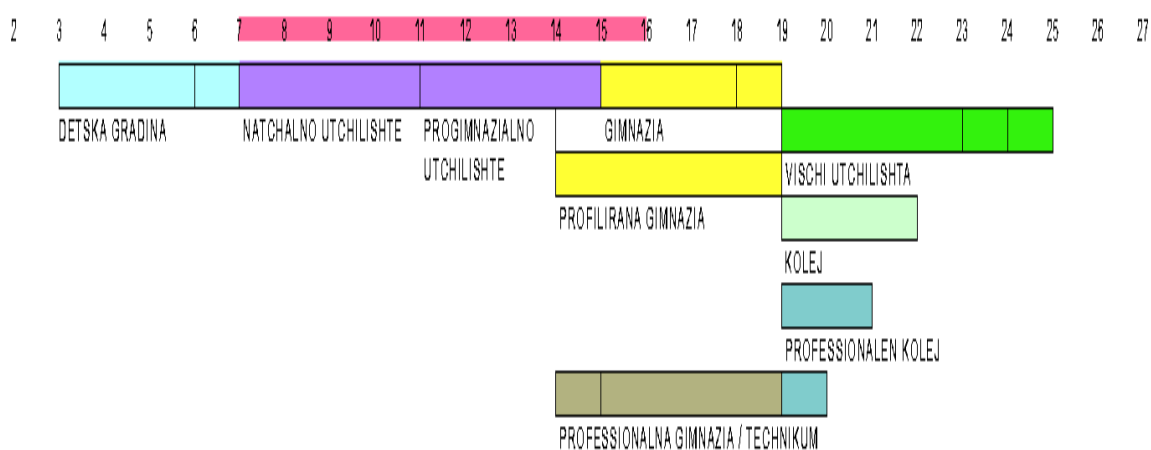


Description of the Science Teacher Training in Bulgaria

1. The structure of the educational system

The structure of the educational system in the Republic of Bulgaria is composed of the following levels: preschool education, school education (basic and secondary) and higher education. Figure 1 illustrated these levels; the number in the figure is the age of the pupils

Figure 1



Preschool education [DETSKA GRADINA] comprises children from 3 to 6/7 years of age. Kindergarten attendance is compulsory from 6 years and include school readiness preparation.

Basic education in Bulgaria 7-15 years of age (1st class 1 through class 8) includes **primary school** stage [NACHALNO UTCHILISHTE] 7-11 years of age. (1st class through 4th class) and a **pre-secondary** [PROGIMNAZIALNO UTCHILISHTE] stage 11-15 years of age (5th class through 8th class).

Secondary education [GIMNAZIA] may be divided into secondary general (with comprehensive and specialized schools) and professional (vocational). Secondary general education is provided at comprehensive schools 15-18/19 years of age (3 or 4 years of study, 9th class through 11/12th class) and at specialized (profiled) schools (4 or 5 years of study). Pupils may enter specialized schools on completing 7th or 8th class and taking entrance examinations, which correspond to the profile of the respective school (Bulgarian grammar and literature, mathematics, the humanities, etc.).

The university type of higher education [VISCHI UTCHILISHTA] is provided at the universities and the specialized higher schools – academies, institutes. It includes the following stages:

1. First stage – a course of study of at least 4 years, receiving a Bachelor's degree upon graduation;
2. Second stage – a course of study of at least 5 years, or 1 year following a Bachelor's degree, receiving a Master's degree upon graduation;
3. Third stage – a three-year course of study upon obtaining a master's degree that meets the requirements for a Doctor's degree.

Colleges [Filiars] are included in the system of higher education and allow the acquisition of university education Bachelor's degree in some towns in the administrative range of the Universities.

2 Science teachers for lower and upper secondary schools

All teacher for primary, lower and secondary schools in Bulgaria are required to have height education. At the moment 98% of the teachers in Bulgaria are with the Univerity degy. Four universities in Bulgaria situated in the towns; Sofia, Plovdiv, Blagoevgrad and Shumen are training teacher students. The Subject Core of the pedagogical courses and studies curricula were elaborated by the Ministry of Education and Science, hence they are similarly in all Bulgarian universities. As a rule, persons who have taken the matriculation examination and who thus have completed upper-secondary school are eligible for university studies.

2.1 Organization of the science teacher training in the University of Plovdiv

At the Faculty of Education in The University of Plovdiv it is possible to obtain qualification of teacher in the level of primary school (1-4 grade). At the Faculty of Physics, Chemistry and Biology it is possible to obtain qualification of subject teacher on the lower and secondary school level (5-11/12grade). The education of the Science teachers in the University of Plovdiv is two-subjects: Physics and Mathematics in the Faculty of Physics, Chemistry and Physics in Faculty of Chemistry and Biology and Chemistry in Faculty of Biology. The course of study for these two-subjects is 4 years and corresponds to Bachelor's Degree. Students who graduate these double subjects can teach physics, matematics, chemistry and biology. The Master's Degree in the university takes additional one year and a half of full-time studies.

The students from other specializations in the above faculties (in the Faculty of physics they are; Physics and Engineering physics and in the Faculty of chemistry; Chemistry and Computer chemistry) can obtain pedagogical qualification by studding a pedagogical module parallels or after their subject Bachelor's Degree.

2.2 Study programs

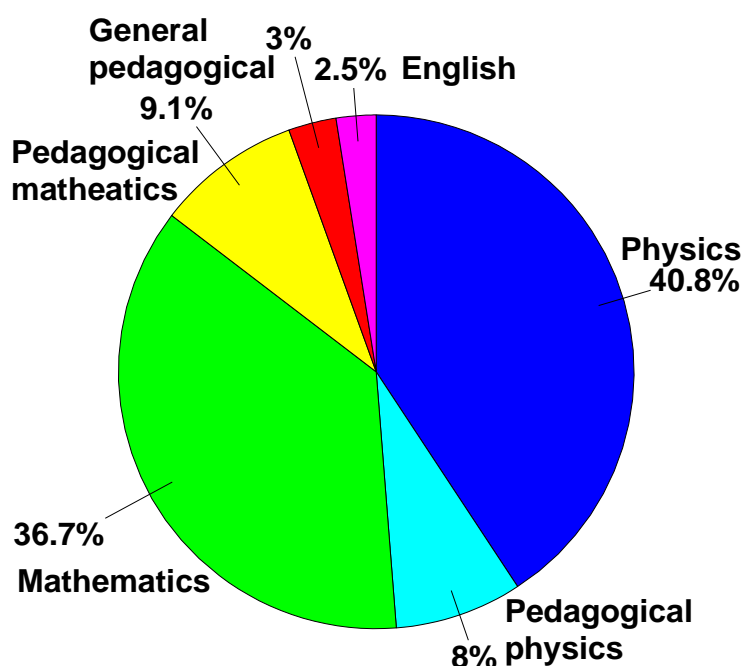
An academic year at University consists of 30 work weeks divided into 2 semesters. The first semester starts in the fist week of October and ends in January(wither term). Between the two semesters students have 1 month to prepare and take their exams. The second semester starts in the last week of February and ends the first week of June (summer term). Students have 1 month to prepare and take their exams. According to Bologna process in order to compare our curricula for bachelor's and master's level with similar curricula used in other EU countries, we

present them described also in ECTS-credit points (European Credit Transfer System).The credits points (cp) in the Faculty of physics for one semester are 30 and in this way the Bachelor's Degree is equivalent of $8 \times 30 = 240$ cp. Now we present an overview of modules and subjects that must be studied at the Faculty of Physics and Faculty of Chemistry in order to obtain the qualification of physics and mathematic and chemistry and physics teacher on gymnasium level.

2.3 Modules and subjects

The BSc programme in Physics and Matematics provides two basic Modules in Physics and Mathematics and a Pedagogical module. The counting of the subjects in these modules is given in Scheme 1.

Scheme 1. The relative weight of the subjects. Specialization Physics and Mathematics



The modules of Physics and Mathematics are given in the in Table 1and 2

Table 1. Module of the Physic subjects. Specialization Physics and Mathematics.

N	Subjects*	term	L	S	E	Total hours	Cred.	Control
1	Mechanics	I	3	2	3	120	8	Ex
2	Molecular Physics	II	2	2	3	105	8	Ex
3	Electricity and Magnetism	III	3	2	3	120	9	Ex
4	Optics	IV	3	2	3	120	8	Ex
5	Mathematical methods of Physics 1	IV	2	1	0	45	4	Ex
6	Theoretical Mechanics	IV	2	1	0	45	4	Ex
7	Mathematical methods of Physics 2	V	2	1	0	45	4	Ex
8	Electrodynamics	V	2	1	0	45	4	Ex
9	General electronics and radio technique	V	3	0	3	90	6	Ex
10	Quantum mechanics	VI	2	1	0	45	4	Ex
11	Astronomy 1	VI	2	0	1	45	3	Ex
12	Atomic Physics	VI	3	1	2	90	6	Ex

13	Astronomy 2	VII	2	0	1	45	4	Ex
14	Statistic Physics and Thermodynamics	VII	2	1	0	45	4	Ex
15	Nuclear Physics	VII	2	1	2	75	6	Ex
16	Elect subject 1	IV	2	0	0	30	2	Ex
17	Elect subject 2	VIII	2	0	0	30	2	CEx
18	State Exam						10	SEx
19	Total					1155	98	

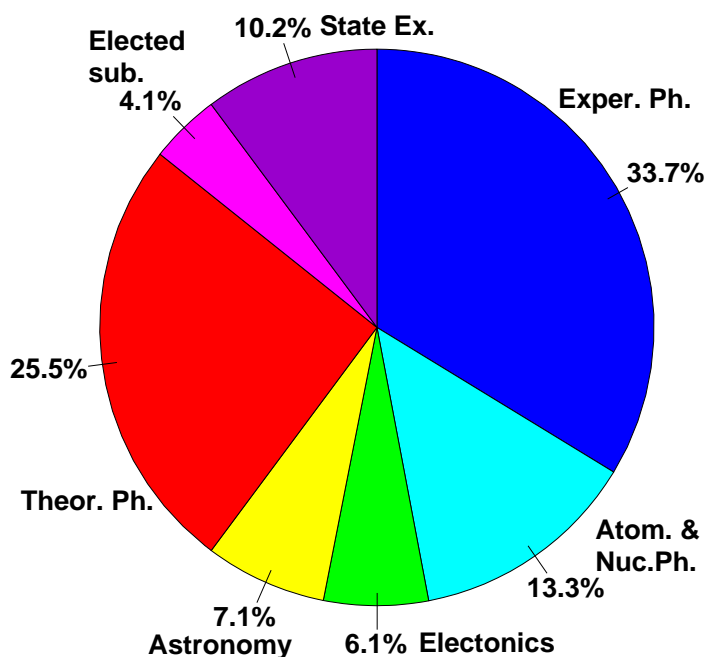
- L-lecturers, S-seminar, E-exercise, hours per week, Cred.-credit points, Ex –exam, CEx- current examination and SEx- State exam.

Table 2. Module of mathematics subjects. Specialization Physics and mathematics.

N	Subjects	Term	L	S	E	Total	Cred.	Contr.
1	Linear Algebra and Analytical Geometry	I	4	4	0	120	8	Ex.
2	Mathematical Analyst 1	I	3	3	0	90	8	Ex.
3	Mathematical Analyst 2	II	3	3	0	90	7	Ex.
4	Algebra	II	2	2	0	60	5	Ex.
5	Informatics 1	II	2	0	2	60	5	Ex.
6	Differentially Equations	III	2	2	0	60	5	Ex.
7	Informatics 2	III	2	0	2	60	5	Cr.Ex.
8	Algebra with theory of number	III	2	2	0	60	5	Ex.
9	Complex Analyst	IV	2	2	0	60	5	Ex.
10	Probability Theory and Mathematical Statistics	IV	2	0	2	60	4	Ex.
11	Differential Geometry	V	2	2	0	60	4	Ex.
12	Numerical methods and Optimization	V	2	0	2	60	4	Ex.
13	Synthetic Geometry	VII	2	2	0	60	4	Ex.
14	Elected subject 1	III	2	0	0	30	2	Ex.
15	Elected subject 2	IV	2	0	0	30	2	Cr.Ex
16	Elected	VIII	2	0	0	30	2	Ex.
17	Elected subject 4	VIII	2	0	0	30	2	Ex.
18	State exam	VIII					10	St.Ex.
	Total					1020	88	

As may be seen from the Tables 1 and 2 and Fig 1 both modules are practically equivalent as in working hours, for Physics 1155 and for Mathematics 1020, as the same as in the credit points for Physics 98 and for Mathematics 88. In both module number of the studied subjects is 17 and included practically the main branches of Physics and Mathematics. The relative weight of the Physics subjects is given in the Scheme 2.

Scheme 2. The relative weight of the physics subjects. Specialization Physics - Mathematics.



In the Table 3 the module of the pedagogical subjects is given

Table 3. The Module of the Pedagogical subjects. Physics and Mathematics

N	Subjects	Term	L	S	E	Total hours	Cr.	Con.
<i>General Pedagogical</i>								
1	Psychology	I	3	0	0	45	3	Ex
2	Pedagogy	III	3	1	0	60	4	Ex
<i>Methodology of Physics</i>								
3	Audio, visual and information teaching equipment	II	0	0	1	15	1	CEx
4	Methodology of the teaching of Physics	V-VI	2+3	0	0	75	5	Ex
5	Hospice in Physics	VII	0	0	2	30	2	CEx
6	Methodology and techniques of school experiments in Physics	VI	0	0	5	75	6	CEx
7	Current teaching practice in Physics	VII	0	0	3	45	3	CEx
8	Pre-graduate teaching practice in Physics	VIII	0	0	3	45	2	SEx
<i>Methodology of Mathematics</i>								
9	Methodology of solution of mathematical task	V	2	2		60	4	CEx
10	Methodology of the teaching of Mathematics	V-VI	2+3	0	0	75	5	Ex
11	Hospice in Mathematics	VI	0	0	2	30	2	
12	School mathematics 1	VII	2	2		60	3	CEx
13	School mathematics 2	VII	2	2		60	3	CEx
14	Current teaching practice in Mathematics	VII	0	0	3	45	3	CEx
15	Pre-graduate teaching	VIII	0	0	3	45	2	SEx

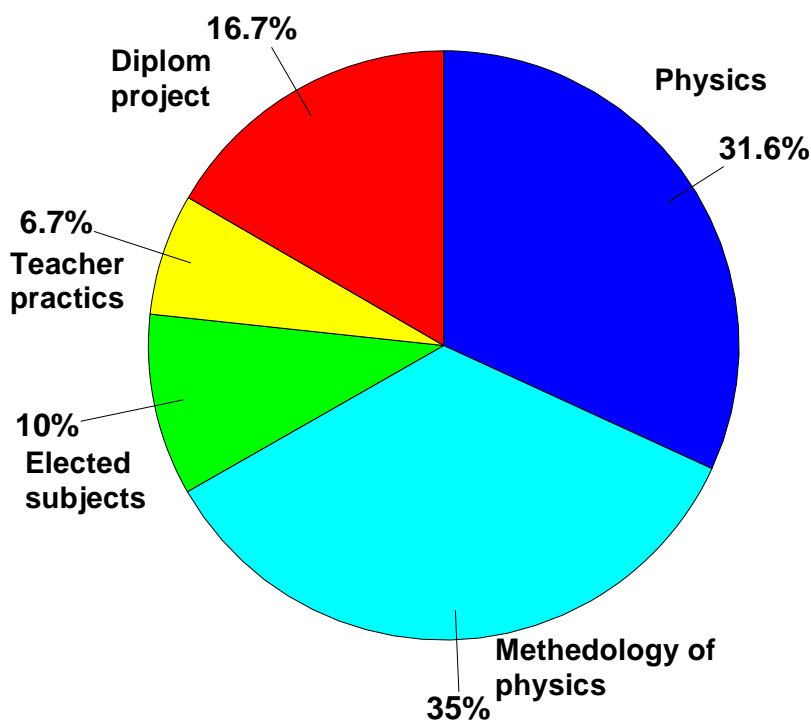
	practice in Mathematics						
	Total				765	48	

*L-lecture, S-seminar, E- exercises in hoers per week. Cr.-credit points, Con.-control, Ex.-exam, CEx.-curent exam, SEx-State exam.

The students from other specializations in the Faculty of Physics to obtain Physics teacher qualification study a module very close to the sub-modules of the General pedagogical and Methodology of Physics in the Table 3.

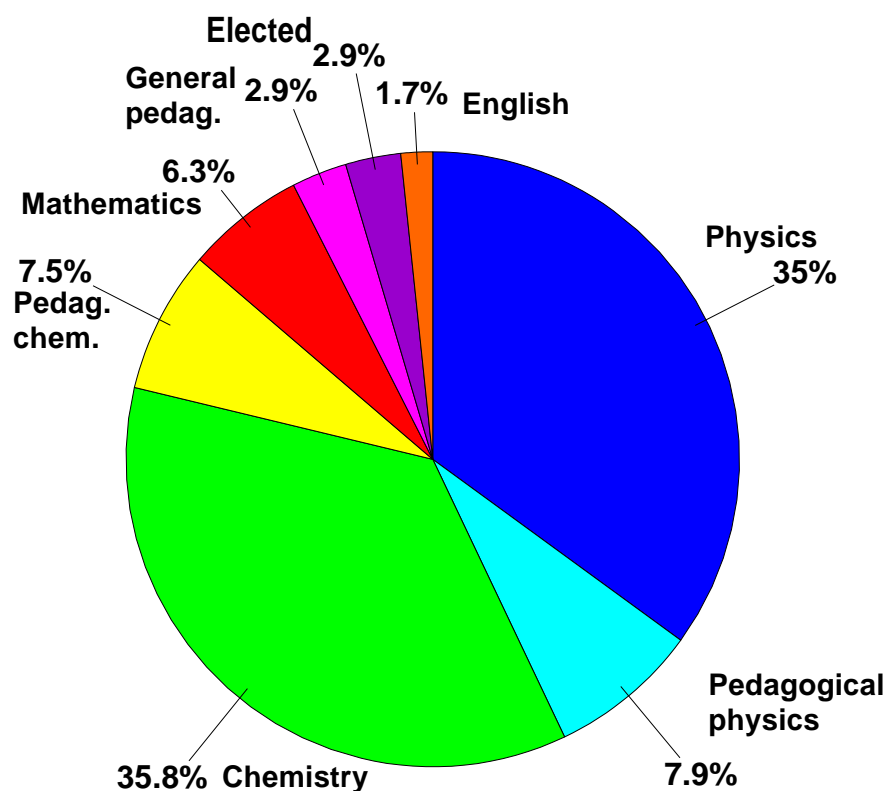
The Master degree provides a additional module of 550 working hours corresponding to 60 credits points. The study form is part-time. The contest of the subjects in the course of the Master degree is given in scheme 3

Scheme 3. The relative weight of the subjects in the_Master's degree teacher of physics.



The contest of the subjects in the course of the specialization Chemistry and Physics is plotted in scheme 4.

Scheme 4. The relative weight of the subjects in the specialization Chemistry and Physics



3 Discussions

As may be seen From Scheme 1, Table 1, Table 2 and Scheme 4 the future since teachers are provide with a very strength ground in there subjects. The students in specialization “Physics and Mathematics” as future teacher in Physics has a stable ground in Mathematics, it will be mention that in addition of the mathematical Module 2 they study Mathematical methods of physics in two parts, the subjects number 5 and 7 in Table 1. From Scheme 2 and Table1 it may be seen that in addition to Experimental physics Atomic and Nuclear physics are two separate courses and Theoretical physics is 25.5% of there studies. Pedagogical subjects seems to be are substantial part of the study of the science teacher as it follows from Table 3, Scheme1 and Scheme 4, for the students in specialization Physics and Mathematics it is 20.1% and for the students in specialization Chemistry and Physics 18.3% of the credit points. Elective subjects give possibility students to choose a subject in which they can prepare a diplom project. The teacher practice takes please in three semesters VI, VII and VIII and the last one is with the estimation of State exam.

The science teacher training in Bulgaria for Bachelor's degree is two-subjects with 3000 study hors in the University and as may be seen from Tables 1, 2 and 3 students takes 34 exam, 16 current examinations and 3 State exam. Such kind of study is heavy and a substantial part of the students satisfied with a minimal knowledge in more theoretical subject. The lectures (see Tables 1-3) are the main teachers’ tool and the given knowledge’s are mainly theoretical. This academic approach reflects on the teacher practice in the school. The lessons are more or less theoretical; applications in the industry or in the human life are used only as examples for the application of theory. A lesson treads some given phenomenon and relations with other phenomena or some generalization of the problem is discussed rarely.

The advantages of the constructive approach are well estimated in the University of Plovdiv and we hope this project to stimulate it’s to spread over the high and school education and in this way to improve the since teacher training.