

Computer Science

In this subject students get acquainted with principles of creating software, operation of computer systems and a computer impact on a life of an individual in a society.

Exam

Students are required to show the ability to manage principles of creating software in a piece of work called *dossier* where they illustrate all the phases of creating a software product by a dealing with a chosen task (20 – 100 pages). They write this work at home for 2 – 3 months and it is assessed externally. Dossier makes 35 % of the exam. Its format is set and so are the strict assessment rules.

The second part of the exam consists of 2 tests which cover algorithm problems and principles of computer systems operation. A part of the tests also contains questions dealing with a predetermined task from a real life (Case Study).

Programming language

Algorithms in tests are written in a “pseudocode” which is similar to Pascal language and has some factors of C language. A similar language is used in the lessons when recording algorithms, it is compulsory to use it in the dossier so every student will surely learn it. It is possible to use any of Pascal, C, C++, Delphi, VisualBasic languages.

We have worked in Pascal or C languages for the time being, we could consider Delphi in future.

Students learn the programming language step by step while solving problems and algorithms. Beginners should start in Pascal, advanced students can, after the agreement with a teacher, change for the other language.

HL or SL?

HL student is required to manage more complicated algorithms and to judge and estimate the computationally complexity, to master more programming techniques and use more complex compositions of data. A student should also get deeper into principles of computer systems operation.

When considering HL, students should not have worse results in the national curriculum mathematics than B grade and HL Computer Science students usually also chose HL mathematics in IB Programme. SL curriculum is a subset of HL curriculum.

Lessons

SL and HL students are taught in a group together. If a timetable enables it, students in the first year also attend the HL lessons, so it is usually more than 3 lessons per week. This happens mostly in the first months when the basics of programming and dealing with algorithms are taught. Advanced students who „know everything“ are getting acquainted with a different approach at this time (not only creating programs but, progressively, all the parts of creating software) and simultaneously are getting familiar with a new programming language. They also like to solve problems from different programming competitions.

HL students have usually more homework that is more complicated and they also prepare reports.

Preps

usually require reading books, web pages as sources, programming and description of algorithms. It is possible for all students to use computers and Internet in a school IT lab from Monday to Friday - from 7.45 am to 5 pm (to 6 pm when in need). The creating and

realization of algorithms requires, apart from a common sense, also skills, so it is necessary to prepare at home regularly and correspondingly long enough. So called „optimistic effect“ is known: presume the problem is solved in 30 minutes, there is 90 % probability that you will have finished it in 2 hours. Computer Science has also a positive feature: solving problems is surely more interesting and easier than memorizing loads of facts.

Comparison to the national curriculum

In contrast with an „informatics“ subject in a national programme, which is intended to master the using of computers in a daily life (MS Office), Computer Science is targeted at creating software and principles of computer systems operation.

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