

Ten-Years Pedagogical Experiment at Moscow University of Geodesy and Cartography: C++ Programming Course Tailored for Surveying Students

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SUMMARY

Over the past 10 years, the Moscow University of Geodesy and Cartography (MIIGAiK) has been conducting a pedagogical experiment in teaching students to program in C++ using a specifically developed training course. An important and distinctive feature of this training course from others is the wide use of material on cartography and geodesy for teaching programming. The C++ programming course focuses on the use of cartographic tasks and geodetic exercises to illustrate various programming language constructions. About seventy a training C++ programs have been developed. The article presents pedagogical methods aimed at increasing the efficiency of teaching C++ programming in training groups of students. A tentative training computer program is discussed. The curriculum considered illustrates the features of passing of parameters to function by value, with the help of a pointer and a reference. The program introduces students to programming language designs such as pointers, references, the rules of their declaration, and the use of the program on the example of a geodesic task of calculating direct and reverse true direction azimuth Line.

Teachers of computer science and programming in high school should be prepared for the requests of students to study specific programming. For example, to teaching programming aimed at solving geodetic and cartographic problems. Such training would allow students to develop programming skills on the basis of solving specified tasks, namely, problems of geodesy and cartography.

The process of teaching the C++ programming language implemented at the Moscow University of Geodesy and Cartography, and the features of its adaptation to the requirements of geodetic science are briefly described. The special role of computer and information solutions in the academic process at the university is emphasized. On the example of a specific C++ training course, methods for solving problems that a lecturer and a teacher encounter while conducting the educational

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process in a higher engineering school are considered.

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