

# Teaching Programming and Design-by-Contract

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**Abstract.** This paper summarizes the experience of teaching an introductory course to programming by using a correctness by construction approach at Innopolis University, Russian Federation. In this paper we claim that division in beginner and advanced groups improves the learning outcomes, present the discussion and the data that support the claim.

## 1 Introduction

Formal methods are still struggling to get a broad acceptance in industry worldwide, and Russia is not an exception. Innopolis is a new IT city [7], incorporating a technopark and a university, aiming at prioritizing the development of IT and software engineering in Tatarstan and in the Russian Federation. Innopolis University (IU) is pioneering several research and pedagogical projects and experiments with innovative teaching methods and curricula. One of the numerous peculiarities of this innovation has been the decision to teach formal methods and correctness by construction together with programming since the first year of the bachelor program. In particular the Eiffel programming language [9] is used as a programming instrument and Design by Contract as a methodological and conceptual tool [8].

This paper summarizes the experience accumulated by following this pedagogical approach. It also reports on the course structure and answers questions related to setup, programming language and chosen paradigm. The work is structured as following: Section 2 motivates the choice of adopting Eiffel as first programming language to be studied. Section 3 describes the structure of the course and the Design by Contract approach adopted. Section 4 reports empirical results on our teaching effort: a poll was presented to students and some data collected. Finally, the numerical data presented is then analyzed and commented in Section 5.

## 2 Eiffel as first language

The choice of Eiffel and Design by Contract as programming and methodological tools for first year bachelors has been long discussed inside the university. After

# Class Interface Design And Programming By Contract

**Didier Musso**



## **Class Interface Design And Programming By Contract:**

## **Class Interface Design And Programming By Contract** Book Review: Unveiling the Magic of Language

In a digital era where connections and knowledge reign supreme, the enchanting power of language has become much more apparent than ever. Its power to stir emotions, provoke thought, and instigate transformation is truly remarkable. This extraordinary book, aptly titled "**Class Interface Design And Programming By Contract**," compiled by a very acclaimed author, immerses readers in a captivating exploration of the significance of language and its profound effect on our existence. Throughout this critique, we shall delve into the book's central themes, evaluate its unique writing style, and assess its overall influence on its readership.

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