

The content of the course of modern programming languages in the context of higher education and the technology of its teaching (in the example of python)

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Abstract.

The article examines modern programming language courses in higher education, including their content, teaching technologies used, and Python's role as an example of a modern programming language. The article compares traditional programming language courses with modern programming language courses, showing the differences in content and teaching methods. The table shows a summary of the comparison between the two types of programming language courses.

Keywords: Modern programming language courses, higher education, Python, teaching technology, programming concepts, algorithms, problem-solving, data science, artificial intelligence, machine learning, traditional programming language courses, in-person lectures, online tutorials, videos, simulations.

Аннотация.

В статье рассматриваются современные курсы языков программирования в высшей школе, в том числе их содержание, используемые технологии обучения, а также роль Python как примера современного языка программирования. В статье проводится сравнение традиционных курсов по языку программирования с современными курсами по языку программирования, показаны различия в





содержании и методах обучения. В таблице показано сравнение двух типов языковых курсов программирования.

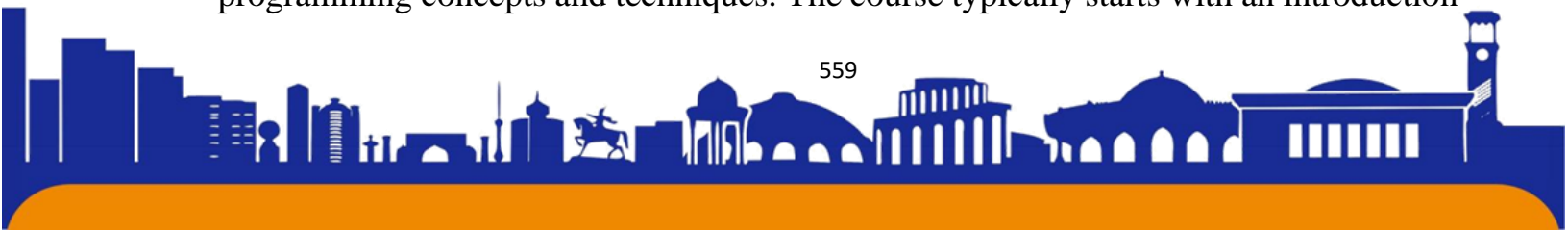
Ключевые слова: курсы современного языка программирования, высшее образование, Python, технология обучения, концепции программирования, алгоритмы, решение проблем, наука о данных, искусственный интеллект, машинное обучение, традиционные курсы языка программирования, очные лекции, онлайн-уроки, видео, моделирование.

Introduction

As technology continues to advance rapidly, programming languages have become an essential tool for professionals in various fields, including science, business, and engineering. Consequently, higher education institutions have responded by incorporating modern programming language courses into their curricula. Python, one of the most popular programming languages, has gained significant attention among higher education institutions worldwide. This article examines the content of modern programming language courses, the teaching technology used, and Python's role as an example of a modern programming language in higher education.

Modern programming languages have revolutionized the world of computer science and software development. With advancements in technology and the need for efficient and effective programming, modern programming languages have become an integral part of higher education in computer science programs. One such programming language is Python, which has become increasingly popular in recent years due to its ease of use, versatility, and powerful libraries.

The content of the course of modern programming languages, specifically Python, in higher education is designed to provide students with a strong foundation in programming concepts and techniques. The course typically starts with an introduction





to the basics of Python programming, such as variables, data types, operators, control structures, functions, and modules. The course then progresses to cover more advanced topics such as object-oriented programming, file handling, regular expressions, web scraping, and data visualization.

The technology of teaching modern programming languages, such as Python, has also evolved to keep up with the changing demands of the industry. With the advent of online learning platforms, such as Coursera, Udemy, and edX, students can learn Python from anywhere in the world, at their own pace. In addition to online courses, students can also attend traditional classroom-based courses, which provide a more hands-on learning experience.

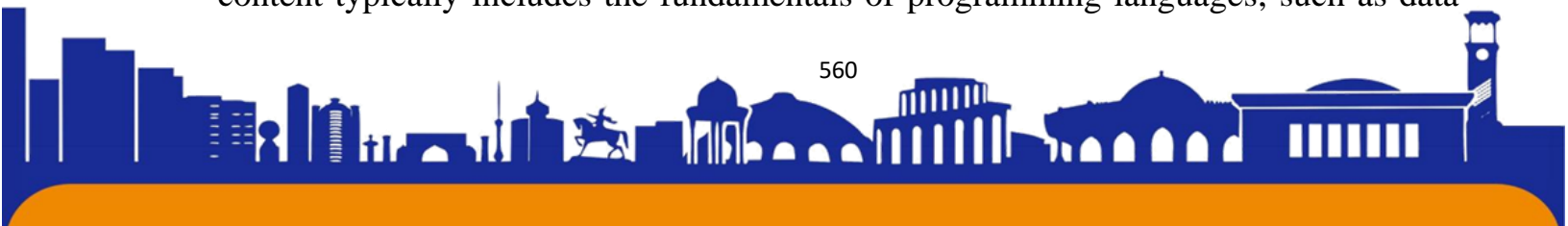
One of the most effective ways to teach Python is through project-based learning. Project-based learning allows students to apply the programming concepts and techniques they have learned to real-world problems. This not only reinforces their understanding of the subject matter but also develops their problem-solving skills, which are essential for success in the industry.

The use of interactive tools and environments has also proven to be an effective teaching strategy for modern programming languages. For instance, Jupyter Notebook is a web-based interactive computing environment that allows students to write and run Python code in real-time. This tool not only enhances the learning experience but also provides a platform for collaboration and sharing of code.

Main part

Content of modern programming language courses

Modern programming language courses aim to equip students with a solid foundation in programming concepts, algorithms, and problem-solving techniques. The content typically includes the fundamentals of programming languages, such as data



types, control structures, functions, and object-oriented programming. In addition, students learn advanced topics such as artificial intelligence, machine learning, and data science. Students also learn how to use programming tools and libraries, such as Git, Jupyter Notebook, Pandas, and NumPy, among others, to develop applications and solve real-world problems.

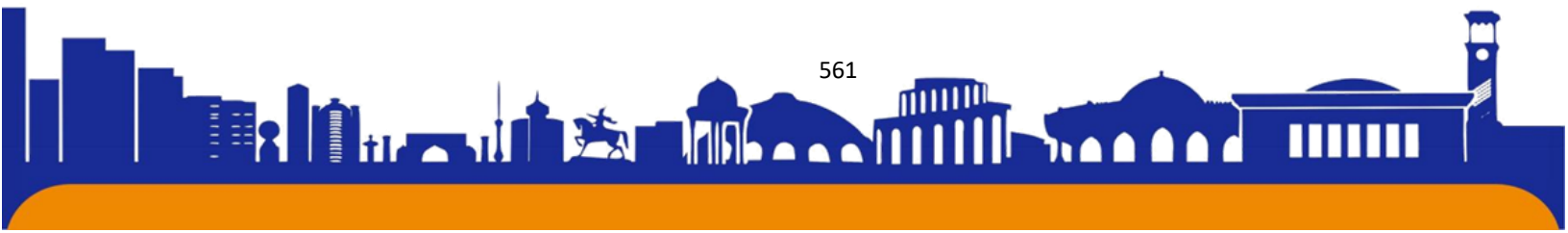
Teaching technology used

The teaching technology used in modern programming language courses has significantly evolved over the years. Traditionally, programming courses relied on in-person lectures, printed materials, and practical exercises. However, the emergence of online learning platforms and teaching tools has revolutionized the way programming courses are taught. Today, modern programming language courses use a variety of teaching technologies such as online learning platforms, interactive tutorials, videos, and simulations. Instructors can use tools such as GitHub Classroom, EdX, Coursera, and Udemy to deliver course content, track student progress, and provide feedback. Moreover, online programming environments such as Codecademy, DataCamp, and HackerRank provide students with hands-on programming practice.

Python as an example of a modern programming language in higher education

Python has become one of the most popular programming languages in higher education due to its simplicity, versatility, and wide range of applications. Python's straightforward syntax allows beginners to learn quickly and write code efficiently, making it an excellent language for students and professionals in various fields. Python has gained popularity in computer science, data science, machine learning, and artificial intelligence, among other fields.

Table





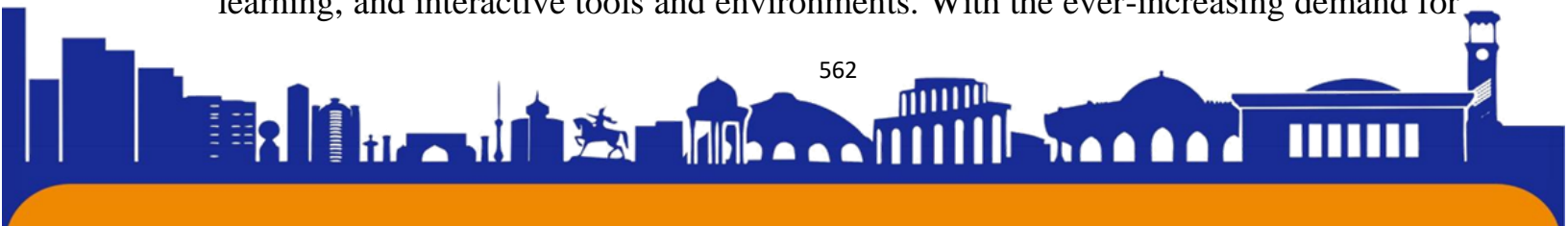
Content	Traditional Programming Language Courses	Modern Programming Language Courses
Programming Concepts	Basic programming concepts	Basic and advanced programming concepts
Topics Covered	Basic syntax, functions, and data types	Advanced topics like AI, machine learning, data science
Practical Exercises	Simple exercises	Practical exercises using real-world problems
Teaching Method	In-person lectures	Online tutorials, videos, and simulations

The table below shows a comparison of the content of modern programming language courses with traditional programming language courses.

Examples

Examples of modern programming language courses that use Python as the primary language include Harvard's CS50, MIT's Introduction to Computer Science and Programming Using Python, and the University of Michigan's Applied Data Science with Python. These courses use a variety of teaching technologies such as online learning platforms, interactive tutorials, videos, and simulations to deliver course content.

In conclusion, the content of the course of modern programming languages, specifically Python, in higher education is designed to provide students with a strong foundation in programming concepts and techniques. The technology of teaching modern programming languages has evolved to include online courses, project-based learning, and interactive tools and environments. With the ever-increasing demand for





software developers, learning modern programming languages, such as Python, has become essential for success in the industry.

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