COMPUTATIONAL THINKING & PROGRAMMING

PYTHON IN MATH CLASSES

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*Constantly learning,
constantly evolving.*

COURSE DESCRIPTION

Computational thinking helps you develop logical processing and algorithmic thinking while solving real-world problems across a wide range of domains. There's a shift in mathematics education from procedural symbolic manipulation toward skills, like computational thinking, that better prepare students for the future of work.

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Python is a free, popular, powerful and easy to learn programming language. With the aid of the Python programming language and a multiple math platform developed by Texas Instruments (that adds modules for Python, like BBC microbit), you'll learn how to visualize solutions for a range of math problems as you use code to explore key mathematical concepts like algebra, trigonometry, matrices and cellular automata.

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People learn best by doing. This hasn't been a daily practice in schools, though, which tend to favor passive learning. "Doing" in English and history classes might mean students write papers or give presentations, and science students perform experiments, but what do math students do? Teachers can use this course's ideas to challenge their students, making Mathematics more approachable and relevant.

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What better way to teach this subject than in a real world context? What better way to develop a math's teaching technique in a STEM context?
Once you develop some programming knowledge, especially when you know how to use Python, you can do this and much more!

COURSE INFORMATION

Course Objectives

This course is for any math teacher that wants to apply the most modern tools available to approach math topics like trigonometry and algebra.

The main goal is about using the newest, coolest tools out there to get creative and learn real computer skills while discovering the connections between math, art, science and technology. Processing will provide the graphics, shapes, motion, and colors, while Python does the calculating and follows your instructions behind the scenes.

By the end of this course, you'll have an arsenal of practical coding solutions that can be used and modified to solve a wide range of practical problems in mathematics and data science.

Learning Outcomes

- Understanding computational thinking;
- Decomposing problems, recognizing patterns & generalizing them;
- Designing algorithms;
- Identify Python language core aspects (programming and features);
- Understand and apply core programming concepts like data structures, conditionals, loops, variables, and functions;
- Use different tools for writing and running Python code;
- Design and write fully-functional Python programs using commonly used data structures, custom functions, reading and writing to files;
- Create digital content for creative learning scenarios;
- Exchange experiences & grow professionally in a European environment, build strong relationships with European teachers
- Reinforce self-awareness as a European citizen;
- Improve language, communication and social skills.

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LET'S LEARN TOGETHER!

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COURSE INFORMATION

Duration: 1 week (6 days – Sunday to Friday – 9h00 to 14h00)

Location: Porto, Portugal

Language: English

Certification: Certificate of Attendance, including a description of the learning outcomes from the previous page; Europass validation

Price: 580€ (course fee + administration costs + social program). Prices according to the new Erasmus+ 2021–2027 program*

*(Our courses are eligible to be completely funded by the Erasmus+ KA1 funds and several other programs)

See more information (e.g. dates, price description, included activities) here.

LET'S LEARN TOGETHER!

DAILY PROGRAM*

DAY 1

- Welcome dinner, icebreaking
- Meet & greet, networking – participants and staff
- Week briefing & planning

DAY 2

- Computational thinking & its importance for learning mathematics
- Developing computational thinking in mathematics without programming – examples
- The need for a programming language to fully develop computational thinking and the motivation for learning math

DAY 3

- First steps in Python programming language
- Solving math problems by applying simple Python's programming language features
- Python conditions in a real-world context

DAY 4

- Using python lists to solve problems with data and probabilities
- Functions in Python
- Case practice, individual work

DAY 5

- Texas Instruments Turtle graphics module/ BBC micro:bit with Python
- Activity performed for students during maths and/or STEM classes using Python language (its capabilities and tools)
- Group Work

DAY 6

- Activity presentation
- Course roundup, feedback, & review
- Learning outcomes' validation
- Certification Ceremony

*This schedule/ program describes likely activities but may differ based on the trainer's discretion and objectives.

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Learning Together believes that well-trained teachers are more motivated & better able to successfully perform and achieve organizational goals! We believe that all organizations' core are its **people**, therefore we organise development courses for education professionals who want to enhance & acquire new competencies related to their work practice. That way, participants can better teach the people of tomorrow, w**hile absorbing new cultures and meeting people all around Europe!**

LET'S LEARN TOGETHER!

Sign up for a course and start your journey with us!

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