

Coding

There are so many degrees, training courses and employment beyond where an ability to code is essential. While learning this skill you will also develop other techniques such as problem solving, creativity, efficiency and logical thought.

There will be two groups

Coding for beginners and **coding for non-beginners**

Coding for beginners

Teacher: AMP Live sessions: Tuesday P2 (9:30-10:30) and Friday (14:00-15:00).

This is an introductory coding course, that assumes no prior knowledge of programming computers. You will be learning how to write computer programs using the Python language, as it is more intuitive than other languages, but still powerful and is used in University Science and Engineering departments across the world. You will work through a series coding challenges that become gradually more challenging and you will become confident as your skills develop. Hopefully you will find coding to be a very creative and rewarding activity.

We will make reference to the *pythonlearn* book here which comes from a *futurelearn* course. I'll get you to try many of the exercises and then start to throw in other challenges and branch out from this book as you get up to speed.

You'll need to download and install Python if it isn't already on your computer (Mac or Windows) <https://www.python.org/downloads/>

You will end up with two new programs, Python, which sits in the background on your computer, doing its thing, and IDLE. IDLE is what you will open up and use to write and test out your Python code. IDLE is an *Integrated Development Environment* - a software package for creating, editing, developing and testing programs. IDLE will be fine for you to begin with, but there are some other ones available that I am testing right now.

It is possible to run Python on a smartphone / tablet using a Python code app. It will be easy to use to begin with and will certainly get you started. There are free apps that will be ok to get you started, but to be able to use further functions it will be necessary to switch to a PC/MC/Laptop or pay money to have full functions on ipads etc. We can discuss this once you're up and running.

Coding for non-beginners:

Teacher: MJC Live sessions: Tuesday p7 & p8, Fri p1 & p2

Resources required:

Independent learning platform - <https://www.codecademy.com/>

Software download: <https://www.fosshub.com/Code-Blocks.html?dwl=codeblocks-20.03-setup.exe>

In this course you will learn the basics of either Java, C or C++; three languages which are primarily used in the world of both computational and pure sciences. The aim is for you to develop your skills to a high enough level to program a micro:bit. How you program it is your choice; from a small hand held game to a heart rate monitor. Get creative.

Here are six quotes from an assortment of science and technology luminaries who know exactly how important coding is to future success.

Facebook and Instagram CEO Mark Zuckerberg is a computer programmer by trade. His coding skills are what allowed him to build Facebook from the ground up out of his Harvard dorm room. Zuckerberg is a strong believer in coding education: *"All of my friends who have younger siblings who are going to college or high school - my number one piece of advice is: You should learn how to program."*
- Mark Zuckerberg

New York lawyer and politician Reshma Saujani is the founder of Girls Who Code, a US nonprofit organization which aims to support and increase the number of women in computer science. She believes coding is a crucial skill for young women and girls to learn: *"Coding is the language of the future, and every girl should learn it. As I've learned from watching girls grow and learn in our classrooms, coding is fun, collaborative and creative."*
- Reshma Saujani

Microsoft co-founder and philanthropist Bill Gates helped usher in the personal computer revolution of the 1980s and 90s and has long been a proponent of coding education: *"I think it's fair to say that personal computers have become the most empowering tool we've ever created. They're tools of communication, they're tools of creativity, and they can be shaped by their user."*
- Bill Gates

World-renowned theoretical physicist and cosmologist Stephen Hawking has spent his life trying to unravel the mysteries of time and space, but even he knows that

it's important to learn the basics before tackling the big problems: *"Whether you want to uncover the secrets of the universe, or you just want to pursue a career in the 21st century, basic computer programming is an essential skill to learn."*

- Stephen Hawking

The late Steve Jobs co-founded Apple and ushered in the age of the iPhone. While he wasn't the star coder at Apple (that honour belongs to Steve Wozniak), Jobs always knew that good code was key to success:

"Everybody should learn to program a computer, because it teaches you how to think."

- Steve Jobs

For further interest – watch this TED talk:

https://www.youtube.com/watch?time_continue=200&v=xfBWk4nw440&feature=emb_logo

Elon Musk, the CEO of Tesla Inc. and SpaceX, was an avid gamer as a kid, but couldn't afford to buy the latest video games or consoles. His solution? He taught himself how to code, made his own video game (which you can see here), and sold it to a computer magazine for \$500. *"I taught myself how to program computers when I was a kid, bought my first computer when I was 10, and sold my first commercial program when I was 12."*

- Elon Musk

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