

STEM for Creatives

Week 1 - Introduction

Louis McCallum Autumn 2021

WELCOME

Unit Info

- Tutor
 - Louis McCallum (me)
- Schedule
 - Mondays 9.30AM-1PM
 - Always in person, in Peckham
- Can book tutorials with me! (link is on the unit page)

WELCOME

Before we start.....

- Have you got your ID card?
- Can you get onto the Wi-Fi?

WELCOME

Unit Info

- What will we learn?
 - Skills-wise, we are a diverse bunch
 - This unit will teach the maths, coding and scientific know-how to bring us all up to the same level, ready to go hard after Christmas

WELCOME

Unit Info

- What will we learn?
 - Coding in Python
 - Basic Statistics
 - Working with Media on Computers (audio, image and film)
 - Relevant Maths
 - Doing Science + Designing Experiments

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Assessments

- 50% 3 x In Class Assignments
 - Work on during term, hand in all together at end of term
 - *Probably* set in Week 3, 6 and 8
- 50% Exam
 - In Week 10
 - Will be open book, online, unlimited time BUT one submission attempt, available for 7 days
 - There will be a mock exam in Week 9

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Covid-19 Precautions

- There is no expectation to Social Distance.
- However, there are still things we can do to ensure safety and reduced disruptions to teaching
 - Please wear a face covering on site, unless you are exempt
 - You can get Lateral Flow tests for free, we would recommend you test yourself twice weekly.
 - You can get vaccinated!
 - If someone tests positive in our group, you should get tested, however, lessons will continue

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Course Info

- moodle.arts.ac.uk
- This is where all the course info, submissions and video recordings will live
- All lectures will be captured, streamed live (for remote students) and available to watch after

STEM

What is it?

- **S**cience
- **T**echnology
- **E**ngineering
- **M**aths

STEM

What is it?

- <https://publications.parliament.uk/pa/ld201213/ldselect/ldsctech/37/3705.htm>
- Do we agree with this split?

Groups with STEM are in bold (Groups A-K):

A - Medicine and Dentistry
B - Subjects allied to Medicine
C - Biological Sciences
D - Veterinary Sciences, Agriculture and related subjects
F - Physical Sciences
G - Mathematical Sciences
H - Engineering
I - Computer Sciences
J - Technologies
K - Architecture, Building and Planning
L - Social Studies
M - Law
N - Business and Administrative Studies
P - Mass Communication and Documentation
Q - Linguistics, Classics and Related Subjects
R - European Languages, Literature and related subjects
T - Eastern, Asiatic, African, American and Australasian Languages, Literature and related subjects
V - Historical and Philosophical Studies
W - Creative Arts and Design
X - Education

STEM

What is it?

- <https://publications.parliament.uk/pa/ld201213/ldselect/ldsctech/37/3705.htm>
- “...the defining characteristic of an...education in the STEM subjects is the ability to think analytically, including about abstract problems, and to use evidence to support propositions. The associated skills a STEM graduate has —including numeracy, literacy, ability to use information technology, programming skills, group working, presentational skills, time organisation, and research skills—are all valuable to any employer”

STEM - Group Task

What does STEM mean to you?

- 30 minutes to research and discuss.
- Then share as a group!
- Post responses to Forum on the Moodle page.

STEM - Group Task

What does STEM mean to you?

- Get into Groups of 4-5
- Pick **TWO STEM disciplines** and answer the following questions. Try and be specific in your responses and include some links or pictures if you can!
 - Think of a positive thing that has come out of this (e.g. Science).
 - Think of a negative impact or use of this (e.g. Science).
 - Think of a way this (e.g. Science) can be relevant to the creative industries. It might help if you pick a specific one.
 - Think of a time you have used this (e.g. Science) in your previous academic or professional work. It may also be something you have used was made possible by this.
 - Think of how you think this (e.g. Science) will be useful in your future work. Or perhaps think of a way you'd like to learn how to use it.

Practical Set up

Getting Ready for Python

- What is Python?
- Where do I get the code for this unit from?
- How to I run this code?

Practical Set up

Getting Ready for Python

- What is Python?
 - For the programming part of this course we will be using Python. Python is an object oriented programming language that is by far the most commonly used in Data Science. It is designed to be easy to learn for beginners and readable.

Practical Set up

Getting Ready for Python

- What is Python?
 - Python is regularly updated (currently on version 3.9) but adoption of different versions is widespread. This means libraries or example code you find may not work with different versions of Python.
 - The biggest difference is between Python 2 and 3 (there are actual syntactical differences), but ALL things we will want to use Python for now will be Python 3.

Practical Set up

Getting Ready for Python

- We are going to install Python
 - It is possible to have multiple versions of Python installed on your computer at once. At any one time, your computer will be pointed towards one as default.
 - It is worth knowing this from the beginning

Practical Set up

Getting Ready for Python

- We are going to install Python
 - We will be installing Python using a package called **Anaconda**. This will give you Python, as well as some useful packages that you'll need, as well as a way for you to manage and switch between different Python environments (more on that later), and install new packages and libraries.
 - 1.Go to <https://www.anaconda.com/products/individual>
 - 2.Download the Graphical Installer for your specific operating system
 - 3.Run the installer you download, choosing the default locations

Practical Set up

Getting the Code

- All the code for this unit lives in something called a “repository”
- The largest commercial version of this is github.com
- We have our own version at git.arts.ac.uk
- The easiest way to get code, and weekly updates, is to use the Github App
- There are instructions on how to download this in class

Practical Set up

Launching a Jupyter Notebook

- This is how we will run most of our Python code
- Anaconda Navigator
 - You will have gotten a piece of software called Anaconda Navigator when you installed Anaconda. Open this.
 - Select Jupyter Notebooks from the menu. This will open a **terminal window** and a **browser window**.
 - In the browser window, navigate to the folder where you have downloaded the tutorial notebooks.

Practical Set up

The Client - Server Split

- What just happened?
 - The program is running in the terminal, and we have a view on it through the browser (You will notice the browser has the address localhost:8888)
 - This client – server set up means that if we close the browser, the notebook doesn't close.
 - It also means we can run notebooks on servers in the cloud, and then interact with them through the browsers on our local machines.