Imperial College London

"Machine Learning Data Science Physics" from Bing DALL-E

PHYS60022/70073

Data Science and Machine Learning for Physics

Tim EVANS (Universe)

Patrick DUNNE (Particles)

Spring 2024

BLACKBOARD

All the current information is on the Blackboard site for this course.

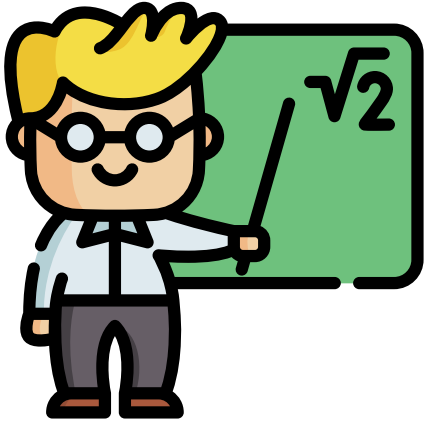
Search for PHYS60022

PHYS60022/70073 - Data Science and Machine Learning for Physics (Spring 2023-2024)

https://bb.imperial.ac.uk/ultra/courses/_39636_1/cl/outline

These slides are only correct at the time of writing.

How the course is taught



- The course is organised in ten sections, one per week.

- Weeks 1 to 4 are run by Tim Evans
- Weeks 5 to 10 are run by Patrick Dunne

- One python notebook every week contains both the lecture material and the exercises for the week.

- The students are intended to work through each section, each notebook over seven days.

Each week

Each week is broken down as follows:-

- The DSML course week starts on **Wednesdays at 09.00** (except last week, week 11) with a one-hour presentation from a lecturer in the computing lab.
- The computer suite is booked for the course immediately after the lecture from **10.00-11.50 on Wednesdays**.
  - Students to work together on the Jupyter notebook for that week.
- Students should then work on the exercises in the rest of the notebook over the following four working days.
- A **feedback/presentation session** with a lecturer and demonstratorson **Mondays at 16.00** in LT2

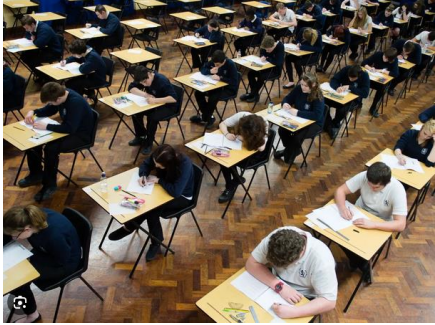
Additional Resources

- The **Ed discussion board** on the Blackboard course site is the best way to ask questions.

- A **feedback exercise** on **Wednesday 28th February** (week 8) *held outside standard teaching hours* in the afternoon from 14.00-16.00.
  - Does not contribute to the final grade
  - Feedback will be given in a meeting with a demonstrator

- **Office Hours**. Two per week with the lecturer, see Blackboard for times and locations.

Assessment



- The course is assessed on a single **one-day practical exam** is provisionally scheduled for
  29th April 2024 (first day of term 3)
  but you should check your exam timetable.
- In the exam students will complete tasks set out in a Jupyter notebook on a Physics PC in the Physics Computer suite
  - Much like the weekly exercises
  - Feedback test in week 8 is a shorter version.
- The exam will be split into two parts.
- Students with special exam arrangements should contact the lecturers asap.
- No other work contributes to the final course mark.

Comments on group working

- Based on the feedback on previous group-based teaching, here all assessment is on individual submissions.
- The learning sessions in the computing lab are **collaborative,** so work together on the notebooks as much as possible.
- Working together is not just the nice thing to do!
  1. Even if you are get through the material quickly, we guarantee that you will understand it better if you help your colleagues understand it too.
  2. Even if you know this all already, a key part of the assessment is **explaining** why you did what you did.

Computing Language Requirements

- The course will use **python**.
  - We do not assume knowledge beyond that seen in compulsory courses.
  - We assume that you are familiar with this and the focus of the feedback sessions is to be the material of this course and not coding questions
- We will use the **markdown language** to write text in Jupyter notebooks.
  - Simple, learn what we need today
- We use basic **LaTeX** in the text for equations.
  - Only basics, learn what we need today.

Hardware Requirements

- Assessment will be on a PC from the Physics computer suite only.
- Weekly work can be performed on the Physics lab PCs.

- **Laptops Not Needed**
  - You are welcome to use your own machine for this course but we do not support any machine other than the PCs in the computer lab.

Bibliography

- The **Jupyter notebooks** are the slides, notes and problem sheets for the course.
  - You can always use the "File" - "Download as" to save notebooks in another format (e.g. pdf)For
- For **statistics** use notes from PHYS40005 Statistics and Measurement course (copy on DSML Blackboard).
- We do not require any textbooks for the course but have three recommendations on the DSML Blackboard site
  - "The Hundred-Page Machine Learning Book“ (free)
  - "Hands on machine learning with Scikit-Learn, Keras and TensorFlow 3rd Edition" (£60).
  - "Introduction to Machine Learning with python" (£50)