



## Subject: Physics & Engineering Pre-University (Extension Material)

Dear Year 13

Congratulations on completing your A-level, even if it has not ended the way you were expecting. It has been a pleasure working with you for the last two years and I wish you all the best for the future. To move you in the right direction, here are some ideas for those of you moving into either a Physics or Engineering course.

Good luck to all of you.

*Mr. Jones*

### **Coding**

I've put this first because you may not have thought of it. In both Physics and engineering you will need to program a computer to work for you, either to crunch the numbers or make something happen. Common languages are C++ and MATLAB and these sites could help you get a head start.

<https://www.codecademy.com/learn/learn-c-plus-plus>

<https://www.learncpp.com/>

You may also need to make use of Arduino or Raspberry Pi and you can learn how to do this here:

<https://www.arduino.cc/en/Tutorial/HomePage?from=Main.Tutorials>

<https://www.raspberrypi.org/blog/learning-python-with-raspberry-pi/>

### **Physics**

If you are heading for a pure physics degree (theoretical, practical or astro) then here are a few ideas.

### **Continue ISAAC physics**

Try to solve the 'extraordinary problems' and set yourself some boards with the difficulty turned right up.

### **Reading on talkphysics**

Talkphysics is the Institute of Physics (IOP) forum for teachers, technicians and pupils to discuss problems and share resources, you'll find lots of information here.

### **Practice tasks**

This website has some practice tasks for you to complete, putting your knowledge to the test

<https://nrich.maths.org/6465&part=>

### **Institute**

The Institute of Physics has a section aimed at university Physics students, there's also a free membership scheme and the opportunity to apply for scholarships and bursaries.

<http://www.iop.org/>



## **Engineering**

For those of you heading for engineering (good choice) here are a similar set of ideas however any of the Physics ideas above will also be relevant.

## **Suggested reading**

You may not be heading for Cambridge but they have made the reading list for engineering available here:

<https://www.admissions.eng.cam.ac.uk/information/reading>

## **Practice tasks**

Again, a chance to see how your physics knowledge applies to your chosen field with problems here:

<https://nrich.maths.org/6466>

## **Institutes**

Each discipline has its own institution, the most common are below. Like the IoP there are opportunities for scholarships and work experience as well as free student membership.

## **Civil Engineering**

<https://www.ice.org.uk/>

## **Mechanical Engineering**

<http://www.imeche.org/>

## **Electrical Engineering**

<https://www.theiet.org/>

Again, good luck and If you have any questions or find something else that is really helpful then please e-mail me.