Imperial College London

Design Engineering Year 1

DE1.3 - Electronics 1

TOPIC 1 – Introducing the Module

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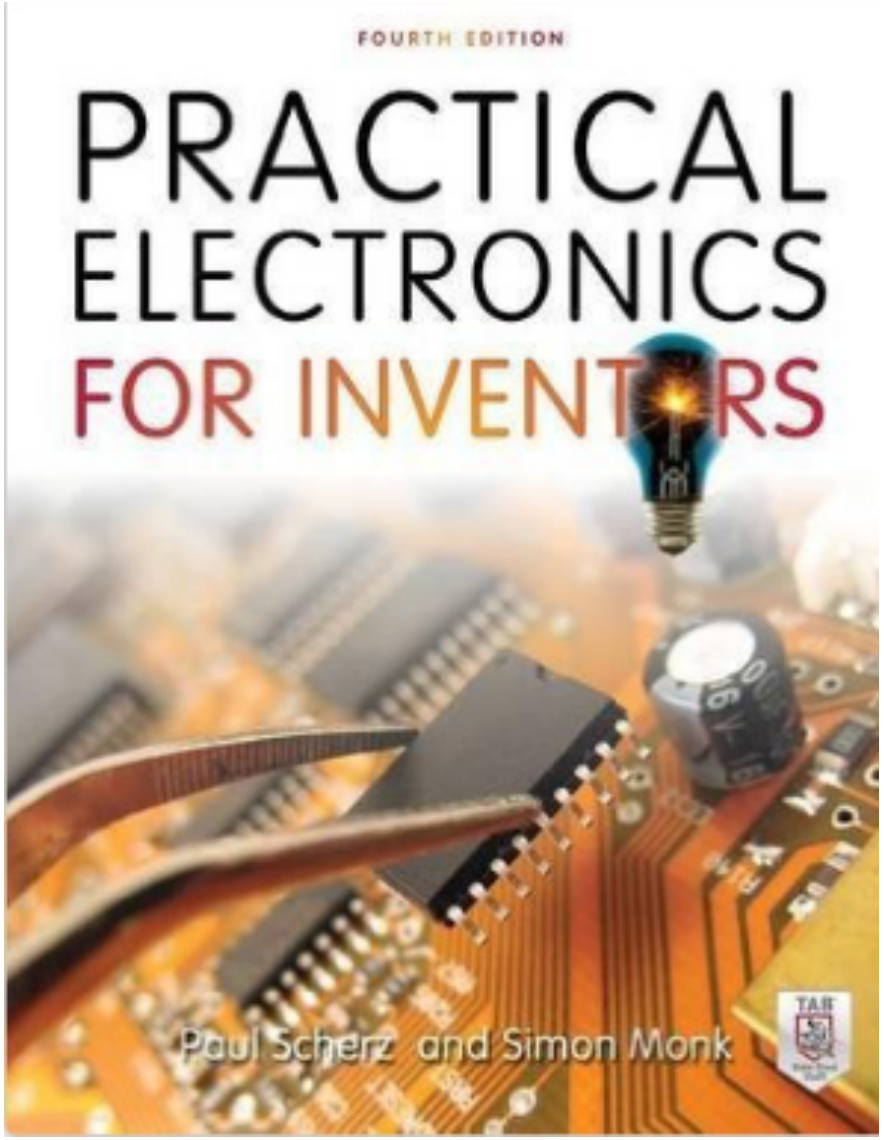
Course Overview

- By the end of the course, you should have learned and understood:
  - Electrical signals in terms of **voltages** and **currents**
  - Measurements of electrical **signals** and their **accuracies**
  - Basic electrical circuit components: **resistors**, **capacitors** and **inductors**
  - Prediction of voltages and currents in electrical **circuits**
  - Electrical **energy** and **power**
  - **Amplification** of electrical signals
  - **Analogue** vs **digital** signals
  - Basic digital electronic building blocks including **logic gates** and **microprocessors**
  - Behaviour of circuits in **steady-state** or in **transient**
  - How to **sense** the environment and produce electrical signals
  - How to **drive** stuff externally from electronics
  - How to generate or store **energy**
  - How to add **flexibility** and **intelligence** to electronic circuits
  - How to communicate

Organization and Schedule

- All lectures will be delivered remotely via MS Teams and/or pre-recorded videos. These are are supported by:
  - Four lab experiments and open-ended challenges which will be assessed through an oral assessment session in the final week of term
  - Six problem sheets to help apply what you have learned to answer questions
  - Five quizzes to test yourself on your understanding
- Recommended textbook
  - Practical Electronics for Inventors, Paul Scherz & Simon Monk (~£29 from Amazon, well worth the money!)
- Examination on a date to be confirmed (week starting 22 June)
- Examination paper 60% of module
- Oral Assessment of Labs 30% of module
- Quizzes 10% of module based as participation (done it = full marks)
- An additional maximum of 5% bonus marks for outstanding participation on MS Teams Forum!!

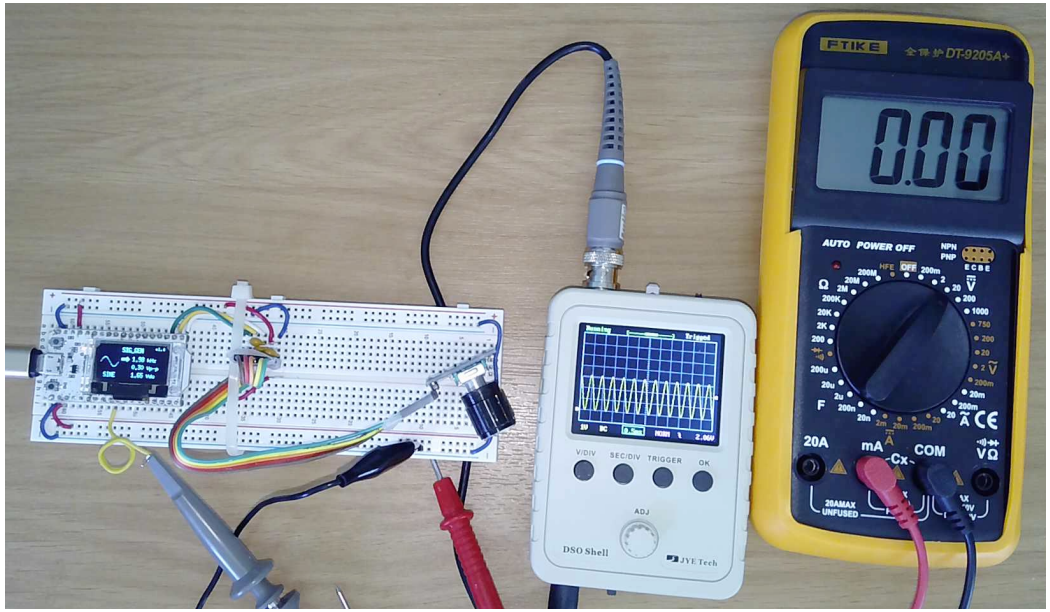
Buy this book!



- Useful for finding out what you don't understand from my lectures
- Useful reference for the rest of your degree and beyond
- Over 1000 pages for under £30 – a bargain!

Home Laboratory Kit

- Home Lab Kit containing everything you need to conduct the practical part of this module from home (with a few exceptions – see later)
- Kit contains:
  - Measurement equipment on loan to you
  - Prototyping breadboard with a ESP32 microcontroller as a signal generator
  - Other electronics components to support the Lab Experiments
- Sustainability – return the measurement equipment in the Autumn, and anything else that can be re-use



What you need to do immediately?

- Go to this webpage and complete your address for the Kit to be sent IMMEDIATELY (need to organise the courier)
- Here is the link:

https://forms.office.com/Pages/ResponsePage.aspx?id=B3WJK4zudUWDC0-CZ8PTB6WYWOWN095Fg5Cucl_BTrBURTdSNFJSRUJVSUxJWk1UOTFJNERIMlFQNi4u

- You will also need to provide:
  - One (but better two) 9V battery for multimeter and your circuit
  - Wire cutters (small)