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 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-CZ8PTB6WYOWWN095Fg5Cucl_BTrBURdSNFJSRUJVSUxJWk1UOTFJNERIMlFQNi4u

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