

**Additional Resources for**

**Physics and Engineering: Problem Solving**

by

Dr. M. Ali Yousuf

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**Course material**

We used the following book as our main text:

* [Engineering Design: An Introduction by John R. Karsnitz](http://www.amazon.com/gp/product/1111645825/ref=ox_sc_act_title_2?ie=UTF8&psc=1&smid=ATVPDKIKX0DER)
* [Workbook for Karsnitz/O'Brien/Hutchinson's Engineering Design: An Introduction, 2nd by John R. Karsnitz](http://www.amazon.com/gp/product/1111645841/ref=ox_sc_act_title_1?ie=UTF8&psc=1&smid=ATVPDKIKX0DER)

You will continue to have access to these books for another 10 months (starting Aug 2019). The textbook is very good and there is a lot more to learn.

PhET Simulations are free and can be found here: <https://phet.colorado.edu/en/simulations/category/physics>

You will continue to have access to the Firia Labs kit and the website, <https://make.firialabs.com/> for another 10 months (starting August 2019).

**Additional documentation**

Firia Labs’ support, <https://support.firialabs.com/support/home>

Python documentation, <https://www.python.org/>

Micro:bit documentation, <https://microbit-micropython.readthedocs.io/en/latest/microbit_micropython_api.html>

**Videos**

Most of the videos, especially those created by me, can be found here:

<https://www.youtube.com/playlist?list=PLtIUKRnuBVlNaWbSu4vc4HA3CstJlrNvw>

**Project ideas**

Micro:bit can be used in many different ways. Check this website for some ideas: <https://www.itpro.co.uk/desktop-hardware/26289/13-top-bbc-micro-bit-projects>

**Microcontrollers and Related Stuff**

Many of these sites provide not just the microcontroller but sensors, gears, motors, etc too.

* Mircro:bit <https://microbit.org/> (THIS IS WHAT WE USED IN THIS COURSE)
* Arduino: A low cost product with unlimited potential, <https://www.arduino.cc/>
* PICAXE: Developed in UK, very easy to program. Check out their interfacing circuits too, <http://www.picaxe.com/>
* PIC Microcontroller: A major manufacturer of microcontrollers. You can get free samples from their website provided you have a .edu email account. PICAXE and BasicStamp are basically PICs too.
* BASIC Stamp: A very easy to use, yet extremly powerfull microcontroller packaged with other hardware. Of particular interest are their educational kits, <https://www.parallax.com/catalog/microcontrollers/basic-stamp>
* Ada Fruit: Another low cost option like Arduino, <https://www.adafruit.com/>
* Raspberry Pi: Much more than a microcontroller - it runs on Linux! <https://www.raspberrypi.org/>

**Free Software for Engineering Design**

Some require local installation, others are online only.

* TinkerCAD, <https://www.tinkercad.com/>
* Autodesk 123D, <http://www.123dapp.com/>
* Fritzing for Circuits, <http://fritzing.org/home/>
* OpenSCAD, <http://www.openscad.org/>
* Fusion 360, [http://www.autodesk.com/](http://www.autodesk.com/products/fusion-360/overview?utm_campaign=fusion_banner_2&utm_medium=direct&utm_source=blog&utm_content=webpage&utm_term=pathfinder)
* Electronics from beginner to pro, [Autodesk Circuits](https://circuits.io/)

**Places to buy electronic parts**

* McMaster-CARR, <http://www.mcmaster.com/>
* Grainger, <http://www.grainger.com/>
* Pololu Robotics, <https://www.pololu.com/>
* Robot Shop, <http://www.robotshop.com/>

**Learning to write / document your work**

Every project must be documented. Writing engineering reports is an art which you learn through practice and by reading other reports. Here is a PowerPoint presentation on the subject, [Writing Engineering Reports](https://owl.english.purdue.edu/owl/resource/647/01/)

You must also learn how to give proper references to a book, an online magazine or a newspaper, etc. The Imperial College of London has a good page on how to write referencs,

[http://www3.imperial.ac.uk/library/subjectsandsupport/referencemanagement/vancouver/references](http://www3.imperial.ac.uk/library/subjectsandsupport/referencemanagement/vancouver/references/)