

# Learning Journey 12-13 BTEC Engineering

Read like an engineer...

**Year 12: Sustainable Energy – Without the Hot Air**  
David J.C. MacKay  
**Engineering: A Beginner's Guide**  
Natasha McCarthy  
**The Gecko's Foot: How Scientists are Taking a Leaf from Nature's Book**  
Peter Forbes

**Year 13: Engineer to Win**  
Caroll Smith  
**An Astronaut's Guide to Life**  
Chris Hadfield  
**Sustainable Materials – With Both Eyes Open**  
Julian Allwood and Jonathan Cullen

## Unit 1 – Engineering Principles

A - Algebraic, trigonometric and calculus methods.

B - Mechanical engineering (static engineering systems, dynamic engineering systems, fluid engineering systems).

C - Electronic and electrical engineering (direct current electricity and circuits, magnetism and electromagnetic induction, single-phase alternating current).

## Unit 2 – Engineering Applications

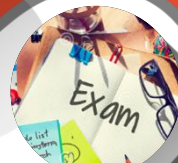
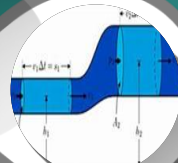
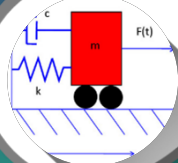
A - The impact of modern and emerging technologies on functional areas across engineering sectors (engineering sectors, functional areas, modern and emerging technologies).

B - Materials and processes used in engineering (materials, properties of materials, manufacturing processes).

## Revision

Engineering Principles  
Engineering Applications

**On to university, apprenticeship or employment...**



## Careers Links

**Year 12:** engage with issues, organisation and personal responsibility, creativity, collaborative working, contextual analysis

**Year 13:** evaluate skills, monitor performance, drive own project, problem solve, explain reasoning.

## Unit 3 – Engineering Design

A - Explore initial design proposals to meet the requirements of an engineering design challenge.

B - Develop initial design ideas into 3-dimensional models in response to an engineering design challenge.

C - Develop 3-dimensional models into 2-dimensional engineering drawings and present the final design solution.

D – Review the design process when responding to an engineering design challenge.

## Unit 4 - Engineering Project

A - Investigate an engineering project in a relevant specialist area.

B - Develop project management processes and a design solution for the engineering project.

C - Undertake the solution for an engineering project and develop skills to present the solution.

## Exams

Unit 1: Engineering Principles exam  
Unit 2: Engineering Applications exam