

2 Unit Mathematics Bridging Course: online materials

Please feel welcome to use our online materials, which are set out in days for you to study.

Each day consists of audiovisual modules (YouTube videos) on a number of mathematical topics for you to play and study. These modules are supplemented by notes, and a booklet of exercises for you to work through. There are also PDFs of the audiovisual modules available in the descriptions box of the YouTube videos.

Exercise booklet

- [Exercise booklet \(pdf, 331KB\)](#)
- [Exercise booklet solutions \(pdf, 380KB\)](#)

Day 1 – Introduction to functions

Audiovisual modules

- [Module 1.1](#) Introduction to functions
- [Module 1.2](#) More on functions

Additional materials

- Complete exercises set 1 in the exercise booklet

Day 2 – Linear functions

Audiovisual modules

- [Module 2.1](#) Linear functions I: Gradients
- [Module 2.2](#) Linear functions II: Finding equations

Additional materials

- [Functions and straight line graphs \(pdf, 113KB\)](#)
- Complete exercises set 2 in the exercise booklet

Day 3 – Factorisation and solving quadratic equations

Audiovisual modules

- [Module 3.1](#) Factorisation and Expansion
- [Module 3.2](#) Quadratics
- [Module 3.3](#) Quadratic equations

Additional materials

- Complete exercises set 3 in the exercise booklet

Day 4 – Introduction to the derivative

Audiovisual modules

- [Module 4.1](#) The derivative of a function
- [Module 4.2](#) Stationary points and quadratic functions

Additional materials

- [The first derivative and stationary points \(pdf, 99KB\)](#)
- Complete exercises set 4 in the exercise booklet

Day 5 – Derivative of a general polynomial function and applications of the derivative

Audiovisual modules

- [Module 5.1](#) The derivative of a polynomial
- [Module 5.2](#) Applications of calculus I
- [Module 5.3](#) Applications of calculus II: Curve sketching

Additional materials

- [Graphs of polynomials \(pdf, 93KB\)](#)
- [The rules of calculus \(pdf, 89KB\)](#) up to page 4
- [Optimisation using calculus \(pdf, 115KB\)](#)
- [Curve sketching using calculus \(pdf, 119KB\)](#)
- Complete exercises set 5 in the exercise booklet

Day 6 – Second derivatives and their applications

Audiovisual modules

- [Module 6.1](#) The second derivative
- [Module 6.2](#) Application of the second derivative: Curve sketching
- [Module 6.3](#) Application of the second derivative: A moving body

Additional materials

- [Second derivative and points of inflection \(pdf, 95KB\)](#)
- Complete exercises set 6 in the exercise booklet

Day 7 – Index laws and power law of differentiation

Audiovisual modules

- [Module 7.1](#) Index laws I
- [Module 7.2](#) Index laws II: Examples and the power law for differentiation

Additional materials

- [Exponents \(pdf, 117KB\)](#)
- Complete exercises set 7 in the exercise booklet

Day 8 – The exponential function and derivatives

Audiovisual modules

- [Module 8.1](#) Exponential functions
- [Module 8.2](#) Applications of the exponential function
- [Module 8.3](#) Composite functions

Additional materials

- [Exponential functions \(pdf, 136KB\)](#)
- Complete exercises set 8 in the exercise booklet

Day 9 – More rules of differentiation

Audiovisual modules

- [Module 9.1](#) The derivative of a composite function

- [Module 9.2](#) The product rule of differentiation
- [Module 9.3](#) The quotient rule of differentiation

Additional materials

- [Composite function rule \(the chain rule\) \(pdf, 88KB\)](#)
- [Derivatives of exponential and logarithmic functions \(pdf, 81KB\)](#)
- [The rules of calculus \(pdf, 89KB\)](#) from page 5
- Complete exercises set 9 in the exercise booklet

Day 10 – The circular functions

Audiovisual modules

- [Module 10.1](#) Circular functions I: The sine function
- [Module 10.2](#) Circular functions II: The general sine function
- [Module 10.3](#) Circular functions III: The cosine function, identities and derivatives

Additional materials and solutions to selected exercises

- [Differentiation of trigonometry \(pdf, 78KB\)](#)
- Complete exercises set 10 in the exercise booklet

Day 11 – Inverse functions and the logarithm function

Audiovisual modules

- [Module 11.1](#) Inverse functions
- [Module 11.2](#) Logarithms
- [Module 11.3](#) The logarithm function
- [Module 11.4](#) Differentiating the logarithm function

Additional materials

- [Logarithmic functions and log laws \(pdf, 167KB\)](#)
- Complete exercises set 11 in the exercise booklet

Day 12 – Absolute value

Audiovisual module

- [Module 12.1](#) Absolute values

Additional materials and solutions to selected exercises

- [Absolute values \(pdf, 83KB\)](#)
- Complete exercises set 12 in the exercise booklet