

**WMG**

Academy for Young



**engineers**

**Coventry**

# **YEAR 12 CURRICULUM BOOKLET**

**2025 - 2027**



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## INTRODUCTION

We look forward to welcoming you to the WMG Academy for Young Engineers. As you begin your Post 16 studies you will be developing new skills, knowledge and exploring the world of engineering through your programmes.

Please read carefully through all of the information about the courses that will be on offer in September along with the support and guidance programme. This will help you to make a final decision on your programme of study with us. We will guide you to a programme which takes into consideration your future career aspirations and interests.

We offer a student-led curriculum based on the options students select or opt for each year and we reserve the right not to run courses which are not viable due to low numbers of staffing capacity. However, we do our utmost to accommodate all requests and combinations of subjects.

Choosing your Post 16 programme of study is an important decision. We recommend that you carry out research into your choice of potential careers, talk to your parents/carers and contact universities and companies about the entry requirements for specific courses and apprenticeships to ensure that you are as informed as possible before making your final decisions.

Alongside your programme of study, all Year 12 learners will participate in a pastoral and enrichment programme which incorporates numerous opportunities for employer and university engagement and first class careers and destinations guidance.

Please note, that, in line with Government regulations, any Post 16 student who has not achieved a grade 4 in Maths or English will be expected to re-sit this during their time at WMG Academy until they have achieved this level.

## GUIDANCE ON APPLYING FOR A PLACE IN SIXTH FORM

The WMG Academy for Young Engineers understands the complexity of choosing your Post 16 programme of study and has prepared the following support to assist you:

### RESEARCH

Please read through all of the course information within this booklet. Think about where you want to be in two to five years time and find out what you need to do to achieve your aspirations and aims. Contact universities, further education colleges and companies; look at their entry requirements and then think about your strengths and weaknesses. Do they match up?

### ADMISSION PROCEDURE

Applications for Post 16 courses need to be sent directly to WMG Academy by the 31st January.

Students wishing to apply should follow the QR code on the website or on the front page of this booklet.

### EVENTS

Once we have received your application, you will be invited to attend a number of events - coffee mornings, taster days, Warwick University visit, meet employers; please look out for emails with dates and timings and get yourself signed up for them.

### GCSE RESULTS - THURSDAY 21ST AUGUST 2025

On the day of your GCSE results, we ask that you come to the academy, bringing a copy of your GCSE results so we can confirm your programme of study. Your programme of study can be adjusted at this stage if you have performed differently to as you expected in your GCSEs. Details regarding how to do this will be sent out to all applicants nearer the time.

### INDUCTION DAYS

As part of your induction programme, you will be invited to join us in the summer term for an initial taster day and there is a bespoke induction programme at the beginning of the term in September 2025 when you join the academy. The aim of these days is to familiarise yourself with the academy, your chosen courses, our staff and how we support students on their journey with us.

# T-LEVEL TECHNICAL QUALIFICATION IN ENGINEERING, MANUFACTURING, PROCESSING AND CONTROL

Awarding Body: City & Guilds

Course Code: 8730 / 8713

QAN: 610/0971/4 - [Click here for more information](#)

## OVERVIEW OF THE COURSE

T-Levels are new courses which will follow on after GCSEs and are equivalent to three A Levels. These two-year courses have been developed in collaboration with employers and businesses so that the content meets the needs of industry and prepares learners for the world of work.

The qualification will help you gain an understanding of the engineering industry and the sector, and you will cover topics such as: processes of production and manufacturing, materials used in production, manufacturing, and fabrication environments, specialist machinery utilised in the production and manufacturing environments, product and project management and quality assurance and quality control. A learner will also complete one standalone occupational specialism: Fitting and assembly technologies.

WMG Academy will work with local employers to provide a 45 Day industry placement to be completed by the student. The employer will contribute to the knowledge and delivery of training whilst providing demonstrations and talks on the industry to enhance the students' understanding of the industry sector.

## CONTENT AND ASSESSMENT

### Technical qualification scheme of assessment overview

**Core Component** – Learners must complete all assessment components

Assessment component	Method	Duration	Marks	Weighting	Marking	Grading
Exam paper 1	Externally set exam	2.5 hours	100	35%	Externally marked	This component will be awarded on the grade scale A* - E
Exam paper 2	Externally set exam	2.5 hours	100	35%	Externally marked	
Employer-set project	Externally set project	15.5 hours	90	30%	Externally marked	

**Occupational Specialism Component** - Learners must complete one assessment component

Assessment component	Method	Duration	Marks	Weighting	Marking	Grading
Fitting and assembly technologies	Externally set assignment	25 hours 15 minutes	90	100%	Externally moderated	

## ENTRY REQUIREMENTS

At least five GCSEs at Grade 5 and above which include English and Maths at Grade 5, and Grade 5-5 in Combined Science or Grade 5 in Physics.

### T-Level Transition Course

Students that do not meet the entry requirements for the T-level course but still would like to study it can enter the T-level Foundation programme. This program will develop students' Maths knowledge and understanding, improve their oracy and presentation skills as well as developing their practical skills in the workshops and will offer work experience opportunities in preparation for the full T-level course. By enrolling onto the foundation course, students will spend 3 years in the 6th form studying Engineering.

## T-LEVEL TECHNICAL QUALIFICATION IN HEALTHCARE SCIENCE

Awarding Body: NCFE

Course Code:

QAN: 603/7083/X

### OVERVIEW OF THE COURSE

T-Levels are new courses which will follow on after GCSEs and are equivalent to three A Levels. These two-year courses have been developed in collaboration with employers and businesses so that the content meets the needs of industry and prepares learners for the world of work.

The qualification will help you gain an understanding of the health and science industry and the healthcare science sector, and you will cover topics such as: working within the health and science sector, health, safety and environmental regulations, managing information and data, principles of good scientific and clinical practice, core science concepts including the structure of cells, tissues and large molecules, genetics, microbiology and immunology. There are also specific topics relevant to healthcare science including understanding the healthcare science sector, further knowledge of human anatomy and physiology, diseases and disorders, genomics and medical physics, providing person-centred care, infection prevention and control and good scientific practice. A learner will also complete one standalone occupational specialism: assisting with healthcare science.

WMG Academy will work with local employers to provide a 45 day industry placement to be completed by the student. The employer will contribute to the knowledge and delivery of training whilst providing demonstrations and talks on the industry to enhance the students' understanding of the industry sector.

### CONTENT AND ASSESSMENT

#### Core component:

- 2 written examinations
- employer-set project (ESP)

In order to achieve a grade for the core component, the student must attempt both of the external examinations and the ESP. The combined marks from these assessments will be aggregated to form the overall core component grade (A\* to E and U)

#### Occupational specialism component:

- Synoptic assignments (specific to each occupational specialism)

The student is also required to successfully achieve a distinction/merit/pass grade in the occupational specialism component. If the student fails to reach the specified level of attainment, they will receive a U grade.

### ENTRY REQUIREMENTS

At least five GCSEs at Grade 5 and above which include English and Maths at Grade 5, and Grade 5-5 in Combined Science or 2 triple science subjects at grade 5.

## APPLIED SCIENCE EXTENDED DIPLOMA - BTEC

(Equivalent to 3 A-Levels)

Awarding Body: Pearson

Course Code:

QAN: 601/7437/7 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

This BTEC Science course aims to give students a solid foundation in all three sciences, extending their knowledge from GCSE and providing them with the practical skills needed to progress in a career in science or engineering, both in employment and in Higher Education. This course is designed for students who want to continue with science, but for whom A-Levels are not the chosen pathway. This course is made up of 13 modules. Around 25% of the course is exam assessed, while the remaining units are coursework assessed.

### CONTENT AND ASSESSMENT

The following units are mandatory units:

- 1. Principles and Applications of Science** - Externally assessed exam.
- 2. Practical Scientific Procedures and Techniques.**
- 3. Science Investigation Skills** - Controlled assessment.
- 4. Laboratory Techniques and their Application**
- 5. Principles and Applications of Science II** - Externally assessed exam.
- 6. Investigative Project**
- 7. Contemporary Issues in Science** - Externally assessed exam.

In addition to those above, optional units will also be completed in order to bring up the total number of units needed for the triple qualification. This includes units on Forensic Science, Biomedical Science, Disease and Infection and Medical Physics amongst others.

### ENTRY REQUIREMENTS

Students should be aiming to achieve a grade 55 in combined science.

## ENGINEERING DIPLOMA - BTEC

(Equivalent to 2 A-Levels)

Awarding Body: Pearson

Course Code:

QAN: 601/7580/1 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

The BTEC Level 3 in Engineering has been designed to give new entrants to the engineering sector the underpinning knowledge and specific skills needed to meet the needs of modern mechanical engineering industries. This qualification is designed both for those students who wish to enter employment, apprenticeships or those who plan to progress into Higher Education, for example to BTEC Higher Nationals and undergraduate engineering degree qualifications.

### CONTENT AND ASSESSMENT

Students will complete 10 units.

\*Units 1-5 are compulsory for the Diploma.

Unit	Unit Name	Internal / External
Unit 1	Engineering principles*	External
Unit 2	Delivery of engineering processes safely as a team*	Internal
Unit 3	Engineering product design and manufacture*	External
Unit 4	Applied commercial and quality principles in engineering*	Internal
Unit 5	A specialist engineering project*	Internal
Unit 10	Computer aided design in engineering	Internal
Unit 8	Further Mathematics	Internal
Unit 25	Mechanical behaviour of metallic materials	Internal
Unit 44	Fabrication manufacturing processes	Internal
Unit 58	Energy Management	Internal

### ENTRY REQUIREMENTS

Grade 5 or above in GCSE Mathematics.



## APPLIED SCIENCE DIPLOMA - BTEC

(Equivalent to 2 A-Levels)

Awarding Body: Pearson

Course Code:

QAN: 601/7435/3 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

This BTEC Science course aims to give students a solid foundation in all three sciences, extending their knowledge from GCSE and providing them with the practical skills needed to progress in a career in science or engineering, both in employment and in Higher Education. This course is designed for students who want to continue with science, but for whom A-Levels are not the chosen pathway. This course is made up of 8 modules. Around 25% of the course is exam assessed, while the remaining units are coursework assessed.

### CONTENT AND ASSESSMENT

The following units are mandatory units:

- 1. Principles and Applications of Science** - Externally assessed exam.
- 2. Practical Scientific Procedures and Techniques.**
- 3. Science Investigation Skills** - Controlled assessment.
- 4. Laboratory Techniques and their Application**
- 5. Principles and Applications of Science II** - Externally assessed exam.
- 6. Investigative Project**

In addition to those above, optional units will also be completed in order to bring up the total number of units needed for the double qualification.

### ENTRY REQUIREMENTS

Students should be aiming to achieve a grade 55 in combined science.

## APPLIED SCIENCE EXTENDED CERTIFICATE - BTEC

(Equivalent to 1 A-Level)

Awarding Body: Pearson

Course Code:

QAN: 601/7436/5 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

This BTEC Science course aims to give students a solid foundation in all three sciences, extending their knowledge from GCSE and providing them with the practical skills needed to progress in a career in science or engineering, both in employment and in Higher Education. This course is designed for students who want to continue with science, but for whom A-Levels are not the chosen pathway. This course is made up of 4 modules. Around 50% of the course is exam assessed, while the remaining units are coursework assessed.

### CONTENT AND ASSESSMENT

The following units are mandatory units:

- 1. Principles and Applications of Science** - Externally assessed exam.
- 2. Practical Scientific Procedures and Techniques.**
- 3. Science Investigation Skills** - Controlled assessment.

In addition to those above, an optional unit will also be completed in order to bring up the total number of units needed for the single qualification.

### ENTRY REQUIREMENTS

Students should be aiming to achieve a grade 55 in combined science.

## BIOLOGY - A-LEVEL

Awarding Body: AQA

Course Code: 7402

QAN: 601/4625/4 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

Biology A-level will give you the skills to make connections and associations with all living things around you. Biology literally means the study of life and if that's not important, what is? Being such a broad topic, you're bound to find a specific area of interest, plus it opens the door to a fantastic range of interesting careers. This qualification is linear. Linear means that students will sit all their exams at the end of the course.

### CONTENT AND ASSESSMENT

**Paper 1** – 2 hour exam worth 35% of the final grade.

- Biological molecules.
- Cells.
- Organisms exchange substances with their environment.
- Genetic information, variation and relationships between organisms.

**Paper 2** – 2 hour exam worth 35% of the final grade.

- Energy transfers in and between organisms
- Organisms respond to changes in their internal and external environments
- Genetics, populations, evolution and ecosystems
- The control of gene expression

**Paper 3** – 2 hour exam worth 30% of the final grade.

Any content from the 2-year course can be assessed from any unit and any practical.

There is no coursework on this A-Level. However, your performance during practicals will be assessed. At least 15% of the marks for A-Level Biology are based on what you learned in your practicals.

### ENTRY REQUIREMENTS

GCSE Biology at grade 6 or GCSE Combined Science at grade 66 (with grade 6 in the Biology unit exams) is required.

## BUSINESS EXTENDED CERTIFICATE - CAMBRIDGE TECHNICAL

(Equivalent to 1 A-Level)

Awarding Body: OCR

Course Code: 05835

QAN: 601/7699/4 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

This qualification will provide learners with the skills, knowledge and understanding to progress into Higher Education on a business-related programme. The mandatory unit will give learners an understanding of the wider external contexts in which businesses operate and of internal business functions and their interdependencies, and allow learners to appreciate how legal, financial, ethical and resource constraints can affect business behaviour and the influence that different stakeholders can have and how businesses must respond. The optional units cover a wide range of topics to give learners the opportunity to take a unit that is relevant to a specific aspect of business.

### CONTENT AND ASSESSMENT

**Unit 1: The business environment** – In this unit you will develop an understanding of how and why businesses operate in the way they do. You will look at a range of different types of business and business structures, and explore how the ownership of a business and its objectives are interrelated.

**Unit 2: Working in business** – This unit will cover the skills and understanding needed to work effectively within a business environment. This includes arranging meetings, working with business documents, making payments, prioritising business activities and communicating with stakeholders.

**Unit 4: Customers and communication** – In this unit you will learn the purpose, methods and importance of communication in business and the appropriateness of different forms of communication for different situations. You will develop the skills that will help you create a rapport with customers and have the opportunity to practise and develop your communication skills.

**Unit 5: Marketing and market research** – This unit has particular emphasis on the role of market research and how it contributes to marketing decision-making, and the actions a business may take.

**Unit 8: Introduction to human resources** – In this unit you will gain an overview of the HR function and learn about factors affecting human resources planning.

**Assessment:** Units 1 and 2 are external examinations that take place in Year 12 and 13. Units 4, 5 and 8 are internally assessed pieces of coursework.

### ENTRY REQUIREMENTS

GCSE English and Maths at grade 4 or above and a grade 5 or above in Business GCSE if studied.

## CHEMISTRY - A-LEVEL

Awarding Body: AQA

Course Code: 7405

QAN: 601/5731/8 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

A-Level Chemistry attempts to answer the big question 'what is the world made of' and it is the search for this answer that makes this subject so fascinating. From investigating how one substance can be changed drastically into another, to researching a new wonder drug to save millions of lives, the opportunities that chemistry provides are endless.

### CONTENT AND ASSESSMENT

**Paper 1** – 2 hour exam worth 35% of the final grade.

**Physical Chemistry:** Atomic structure, amount of substance, bonding, energetics, chemical equilibria, Le Chatelier's principle and  $K_c$ , Oxidation, reduction and redox equations, Thermodynamics, Equilibrium constant  $K_p$  for homogenous systems, Electrode potentials and electrochemical cells, acids and bases.

**Inorganic Chemistry:** Periodicity, group 2, group 7, properties of period 3 elements and their oxides, transition metals, reactions of ions in aqueous solution.

**Paper 2** – 2 hour exam worth 35% of the final grade.

**Physical Chemistry:** Amount of substance, bonding, energetics, kinetics, chemical equilibria, Le Chatelier's principle and  $K_c$ , rate equations.

**Organic Chemistry:** Introduction to organic chemistry, alkanes, halogenoalkanes, alkenes, alcohols, organic analysis, optical isomerism, aldehydes and ketones, carboxylic acids and derivatives, aromatic chemistry, amines, polymers, amino acids, proteins and DNA, organic synthesis, NMR, chromatography.

**Paper 3** – 2 hour exam worth 30% of the final grade.

Any content from the 2-year course can be assessed from any unit and any practical.

There is no coursework on this A-Level. However, your performance during practicals will be assessed. At least 15% of the marks for A-Level Chemistry are based on what you learned in your practicals.

### ENTRY REQUIREMENTS

GCSE Chemistry at grade 6 or GCSE Combined Science at grade 66 (with grade 6 in the Chemistry unit exams) is required.

## COMPUTER SCIENCE - A-LEVEL

Awarding Body: OCR

Course Code: H446

QAN: 601/4911/5 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

This course helps students understand the core academic principles of computer science. Classroom learning is transferred into creating real-world systems through the creation of an independent programming project.

### CONTENT AND ASSESSMENT

#### **Component 1 – Systems [40% of A-Level]**

The internal workings of the CPU, data exchange, software development, data types and legal and ethical issues.

**Assessment:** Written exam, 2 hours and 30 minutes.

#### **Component 2 – Algorithms and programming [40% of A-Level]**

This builds on component 1 to include computational thinking and problem solving. The focus of this component is developing an understanding of standard algorithms and how to interpret real world problems as a combination of variables and structures which can be manipulated in the digital world.

**Assessment:** Written exam, 2 hours and 30 minutes.

#### **Paper 3 – Programming project [20% of A-Level]**

Students are expected to apply the principles of computational thinking to a practical programming project. They will analyse, design, develop, test, evaluate and document a program written in a suitable programming language. The project is designed to be independently chosen by the student and provides them with the flexibility to investigate projects within the diverse field of computer science.

**Assessment:** Internally marked non examined assessment. This will take approximately 70 hours to complete.

### ENTRY REQUIREMENTS

Grade 6 or above in GCSE Maths, and in GCSE Computer Science or relevant ICT course desirable.

## ENGINEERING EXTENDED CERTIFICATE - CAMBRIDGE TECHNICAL

(Equivalent to 1 A-Level)

Awarding Body: OCR

Course Code: 05823

QAN: 601/4594/8 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

This qualification is designed for students aged 16-19 wishing to gain an understanding of the engineering sector and who wish to study Engineering alongside other A-Levels or vocational qualifications. This qualification could provide entry to employment through an apprenticeship in engineering (e.g. Advanced or Higher Apprenticeships) or could also lead directly to employment in areas of engineering such as mechanical engineering and design, electrical and electronic engineering, manufacturing, automation and systems and control.

### CONTENT AND ASSESSMENT

**Unit 1: Mathematics for engineering (External assessment)** – This unit will develop your knowledge and understanding of the mathematical techniques commonly used to solve a range of engineering problems.

**Unit 2: Science for engineering (External assessment)** – This unit will develop your knowledge and understanding of principles of engineering science and consider how these can be applied to a range of engineering situations.

**Unit 3: Principles of mechanical engineering (External assessment)** – All machines and structures are constructed using the principles of mechanical engineering. Machines are made up of components and mechanisms working in combination. Engineers need to understand the principles that govern the behaviour of these components and mechanisms.

**Unit 4: Principles of electrical and electronic engineering (External assessment)** – This unit will develop your knowledge and understanding of the fundamental principles that underpin electrical and electronic engineering.

**Unit 9: Mechanical design (Internal assessment)** – The aim of this unit is for you to develop the knowledge, understanding and skills to be successful in their design of mechanical engineering components and products.

**Unit 10: Computer-aided Design (Internal assessment)** – The aim of this unit is for you to develop the ability to be able to create 3D models using CAD, and to go on to create 3D assemblies of components within a CAD system.

### ENTRY REQUIREMENTS

Grade 6 or above in GCSE Mathematics.

## ELECTRONICS - A-LEVEL

Awarding Body: WJEC

Course Code: A490QS

QAN: 603/0777/8 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

The WJEC Electronics A level specification provides a sound foundation for the study of electronics or a related area and is a natural progression from GCSE electronics. Successful study will require strong applied maths skills. Studying electronics at A level and beyond provides great job opportunities for Electrical/Electronic Engineers in the UK, including transport networks, renewable energy sources, manufacturing and construction, systems design, programming, robotics and medical engineering. Universities and employers widely recognise the status and value of this A level. Electronics expertise sits alongside CAD and programming skills as one of the most desirable strengths in many companies attracting preferential and higher salaries than other engineering disciplines.

### CONTENT AND ASSESSMENT

The subject is taught in modules and examined at the end of Year 13. The exam is based around students demonstrating core concepts across three component assessments.

**C1 Principles of electronics** - 40% written examination (Knowledge and understanding) - 2hr 45m

1. Semiconductor components
2. Logic Systems
3. Operational Amplifiers
4. Signal Conversion
5. AC circuits and passive filters
6. Wireless transmission
7. Instrumentation systems

**C2 Application of electronics** - 40% written examination (Applying knowledge and skills) - 2hr 45m

1. Timing Circuits
2. Sequential Logic systems
3. Microcontrollers
4. Digital Communications
5. Optical communication
6. Mains power systems
7. High power switching systems
8. Audio systems

**C3 Extended System Design** - 20% NEA coursework (Design, analysis and evaluation)

The NEA is an integral part of the A level and is 20% of the total examination. It requires each learner to complete two tasks independently. These build on the concepts studied throughout the specification. The tasks are both academic and practical in nature and reflect learning from components 1 and 2.

### ENTRY REQUIREMENTS

Grade 6 in GCSE Electronics or GCSE Mathematics.



## FURTHER MATHEMATICS - A-LEVEL

Awarding Body: Pearson

Course Code: 9FM0

QAN: 603/1499/0 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

In this course you will complete more units from the GCE (A-Level) in Mathematics, leading to an additional A-Level qualification in Further Maths. The course is designed to be taught alongside A-Level Mathematics and consists of two compulsory Core Pure Maths units (CP1 & CP2) and two more optional units. There is a degree of flexibility with the optional units to be studied, and this is to be decided in conjunction with teachers. This year we are teaching the FS1 (Further Statistics) and FM1 (Further Mechanics) units.

Many students who take a qualification in Further Maths go on to read Mathematics at university and perhaps then become professional mathematicians. Most, however, are taking Mathematics as a support subject for a wide variety of fields including financial services and medicine.

### CONTENT AND ASSESSMENT

The Advanced GCE in Further Mathematics consists of distinct pure and applied topics:

- Pure (CP1 and CP2) – Proof, Complex numbers, Matrices, Algebra and functions, Calculus, Vectors, Polar coordinates, Hyperbolic functions & Differential equations.
- Statistics (FS1) – Probability distributions and functions, Statistical distributions, Hypothesis testing, Statistical testing.
- Mechanics (FM1) – Momentum and impulse, Work, energy and power, Elastic collisions in one and two dimensions.

Assessment is in the form of externally assessed written examinations, which are taken at the end of the two year programme.

- Four written papers: each contributes 25% of the final grade.
- Each paper lasts 1 hour and 30 minutes.
- 75 marks on each paper.

### ENTRY REQUIREMENTS

Grade 8 or above in GCSE Mathematics.

# INFORMATION TECHNOLOGY EXTENDED CERTIFICATE - CAMBRIDGE TECHNICALS

(Equivalent to 1 A-Level)

Awarding Body: OCR

Course Code: 05839

QAN: 601/7098/0 - [Click here for more information](#)

## OVERVIEW OF THE COURSE

Cambridge Technicals in IT allows students to gain an insight into IT and cybersecurity. Through practical and project-based work, students will develop knowledge and skills in areas such as infrastructure, cyber security, information and project management.

## CONTENT AND ASSESSMENT

**Unit 1: Fundamentals of IT** – A sound understanding of IT technologies and practices is essential for IT professionals. Information learnt in this unit will provide a solid foundation in the fundamentals of hardware, networks, software, the ethical use of computers and how business uses IT.

**Unit 2: Global Information** – The purpose of this unit is to demonstrate the uses of information in the public domain, globally, in the cloud and across the internet, by individuals and organisations. You will discover that good management of both data and information is essential, and that it can give any organisation a competitive edge.

**Unit 3: Cyber Security**– We rely on computerised systems in all walks of life. However, some people have found ways to exploit them and this poses a threat to our safety and security. To deal with this problem the cyber security industry is expanding at a rapid rate. This unit has been designed to enable you to gain knowledge and understanding of the range of threats, vulnerabilities and risks that impact on both individuals and organisations.

**Unit 8: Project Management** – This unit will provide you with the opportunity to understand and use various project planning skills and techniques, thereby enabling you to become more effective in the workplace. Project management skills are essential transferrable skills that can be used for all IT related projects whether it's traditional methodologies or more recently adapted agile approaches within the IT development environment.

**Unit 9: Product Development** - This unit will prepare you to undertake product development activities. The skills that you will learn can be applied to the development of any product, large or small, such as building a network or developing a website.

## ENTRY REQUIREMENTS

GCSE English and Maths at grade 5 or above and a grade 5 or above in IT GCSE if studied.

## MATHEMATICS - A-LEVEL

Awarding Body: Pearson

Course Code: 9MA0

QAN: 603/1333/X - [Click here for more information](#)

### OVERVIEW OF THE COURSE

In this course you will build on the knowledge, skills and understanding learnt during your GCSE Maths studies, as well as develop confidence in applications of mathematics, such as statistics and mechanics, which will help consolidate learning in other subjects, especially the sciences and engineering. A-Level Maths encourages students to develop confidence in, and a positive attitude towards, mathematics and to recognise the importance of mathematics in their own lives and to society. This qualification prepares students to make informed decisions about the use of technology, further learning opportunities and career choices.

### CONTENT AND ASSESSMENT

This A-Level consists of distinct pure and applied topics:

- Pure – Proof, Algebra and functions, Coordinate geometry in the  $(x, y)$  plane, Sequences and series, Trigonometry, Exponentials and logarithms, Differentiation, Integration, Numerical methods, and Vectors.
- Statistics – Statistical sampling, Data presentation and interpretation, Probability, Statistical distributions, Statistical hypothesis testing.
- Mechanics – Quantities and units in mechanics, Kinematics, Forces and Newton's laws, Moments.

Assessment is in the form of externally assessed written examinations, which are taken at the end of the two year programme.

- Three written papers: each contributing 33.3% of the final grade.
- Each paper lasts 2 hours.
- 100 marks on each paper.

### ENTRY REQUIREMENTS

Grade 7 or above in GCSE Mathematics.

## PHYSICS - A-LEVEL

Awarding Body: AQA

Course Code: 7408

QAN: 601/4747/7 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

Studying Physics gives students the opportunity to expand upon their understanding from GCSE science and is a common prerequisite for further study of engineering or sciences. This qualification is linear meaning that students will sit all their exams and submit all their non-exam assessments at the end of the course.

### CONTENT AND ASSESSMENT

1. Measurements and their errors
2. Particles and radiation
3. Waves
4. Mechanics and materials
5. Electricity
6. Further mechanics and thermal physics
7. Fields and their consequences
8. Nuclear physics
9. Astrophysics

#### Assessment:

**Paper 1** – 2 hour written exam based on sections 1-5 and 6.1 worth 34% of the final grade.

**Paper 2** – 2 hour written exam based on Sections 6.2, 7 and 8 with assumed knowledge from previous sections worth 34% of the final grade.

**Paper 3** – 2 hour written exam based on practical skills and astrophysics worth 32% of the final grade.

### ENTRY REQUIREMENTS

GCSE Physics at grade 6 or GCSE Combined Science at grade 66 (with grade 6 in the Physics unit exams) is required.

Students wishing to study A-Level Physics must also study A-Level Mathematics, due to the significant overlap in content.

## PRODUCT DESIGN - A-LEVEL

Awarding Body: AQA

Course Code: 7552

QAN: 603/1133/2 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

This creative and thought-provoking qualification gives students the practical skills, theoretical knowledge and confidence to succeed in a number of careers. Especially those in the creative industries. They will investigate historical, social, cultural, environmental and economic influences on design and technology, whilst enjoying opportunities to put their learning into practice by producing products of their choice. Students will gain a real understanding of what it means to be a designer, alongside the knowledge and skills sought by higher education and employers.

### CONTENT AND ASSESSMENT

**Paper 1: Technical principles** – Written exam: 2 hours and 30 minutes worth 30% of the A-Level.

Students are expected to be able to name specific materials for a wide range of applications. They must also be able to provide detailed and justified explanations of why specific materials and combinations of materials are suitable for given applications, with reference to: physical and mechanical properties (working characteristics), product function, aesthetics, cost, manufacture and disposal.

**Paper 2: Designing and making principles** – Written exam: 1 hour and 30 minutes worth 20% of the A-Level.

Students should be aware of, and able to explain, different approaches to user centred design. That in approaching a design challenge there is not a single process, but that good design always addresses many issues, including: designing to meet needs, wants or values, investigations to inform the use of primary and secondary data, the development of a design proposal, the planning and manufacture of a prototype solution and the evaluation of a prototype solution to inform further development.

**Non-exam assessment (NEA)** – Practical application of technical principles, designing and making principles (50% of the A-level)

A substantial design and make project worth 50% of the A-Level. Evidence can be written or digital design portfolio and photographic evidence of the final prototype.

### ENTRY REQUIREMENTS

Grade 6 or above in GCSE Product Design or an equivalent design subject and GCSE Maths at Grade 5 is recommended.

## EXTENDED PROJECT QUALIFICATION - LEVEL 3

Awarding Body: OCR

Course Code: H857

QAN: 603/2304/8 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

The Extended Project is a stand-alone task and the topic is chosen by the learner. It can relate to any aspect of engineering or manufacturing and will be assessed via an internal assessment which can be in the form of a dissertation, report, design portfolio, design-and-make or manufactured artefact. Learners will develop and extend research; identifying, designing, planning and completing an individual project as well as applying a range of organisational skills. They will need to select information from a range of sources, analyse data, and solve problems to complete their final project outcome. Learners will be allocated a supervisor to oversee and guide them through the project.

### CONTENT AND ASSESSMENT

#### Learners must complete:

A project log which details how they have planned, researched and evaluated their project.

A Project which can be presented as:

- an artefact, model or construction
- a CD/video/DVD of performances or activities
- an audiotape/multimedia presentation
- a journal of activities or events
- a slide or PowerPoint presentation
- a photographic record of the project

Project products must include a written report of between 1000 and 5000 words and a presentation on the process followed and the outcomes produced.

### ENTRY REQUIREMENTS

There are no specific entry criteria for this subject.

## MATHEMATICAL STUDIES - LEVEL 3 (CORE MATHS)

Awarding Body: AQA

Course Code: 1350

QAN: 601/4945/0 - [Click here for more information](#)

### OVERVIEW OF THE COURSE

Level 3 Mathematical Studies (Core Maths) is a qualification designed for students who have achieved a grade 5 or above at GCSE.

It helps to develop students' mathematical skills and thinking and supports courses such as A-level Psychology, Sciences and Geography as well as technical and vocational qualifications.

### CONTENT AND ASSESSMENT

The course consists of two papers, both of which are 1 hour 30 minutes long.

#### Paper 1 assesses:

- 3.1 Analysis of data
- 3.2 Maths for personal finance
- 3.3 Estimation

#### Paper 2 assesses:

- 3.4 Critical analysis of given data and models
- 3.8 Critical path and risk analysis
- 3.9 Expectation
- 3.10 Cost benefit analysis

### ENTRY REQUIREMENTS

5 or above in GCSE maths.