WMG Academy for Young engineers Coventry

YEAR 10 CURRICULUM BOOKLET

2025 - 2027

Contents

INTRODUCTION

As part of the programme of study at the Academy, students will study a core curriculum of Maths, English Language, English Literature, Combined Science and GCSEs alongside a Level 2 (GCSE equivalent) in Engineering Manufacture. Additional choices will complement the core programme of study by choosing three further option subjects. Currently, in addition Further Mathematics GCSE is offered as extension qualification to our most able Mathematicians.

As part of our enrolment process, prior to joining WMG at the age of 14, all students will complete baseline assessments to determine setting and target grades. This data will be made available for you at our 'settling in parents' evening in the early part of Year 10. Further testing will take place during the Autumn term to ensure that we have a thorough overview of each learner's strengths and weaknesses.

In addition to the subjects that are laid out in this booklet, we encourage and support community languages. We appreciate that students coming to WMG academy come from a range of backgrounds and cultures, therefore if there is a language that a student is fluent in, are able to read and write in this language and wish to sit a GCSE qualification in please contact admissions@wmgacademy.org.uk

The WMG Academy for Young Engineers understands the complexity of choosing your Key Stage 4 programme of study and has prepared the following support to assist you.

HOW TO APPLY TO WMG ACADEMY

ADMISSION PROCEDURE

Students wishing to apply for Year 10 entry should go to the Solihull Admissions website. Solihull admissions manage all of WMG Academy admissions at both of our academies for Year 10 entry. **The deadline to apply is 31st January 2025.**

On the 1st March 2025 you will be informed by the Solihull Admissions Service regarding if you have been offered a place. This place needs to be accepted with the authority as soon as possible to prevent it being offered to another student.

Once your place is accepted - The WMG Admissions team will invite you to some events that you must attend

- GL Assessments (our baseline tests) in English, Maths and Science. These are short tests that inform us of where students are in their academic journey so we can get a smooth transition and place them into correct option subjects and sets.
- A guidance session, this is a 'face to face' meeting that takes place with a senior member of staff - where you discuss any queries you may have, discuss the reasons why you want to join us, choose option subjects and learn more about the WMG Academy business like, business led ethos and how we work with employer partners.

EVENTS

There will be a number of events that you will be invited to attend including taster days and parents information events; please look out for emails with dates and timings and get yourself signed up for them.

INDUCTION DAYS

You will have an induction programme at the beginning of the term in September 2025 when you join the academy to familiarise yourself with the academy and our staff.

ART AND DESIGN (FINE ART) - GCSE

Awarding Body: AQA
Course Code: 8202
QAN: 601/8088/2 - Click here for further information

OVERVIEW OF THE COURSE

Fine Art practice is defined as the need to explore an idea, convey an experience or respond to a theme or issue. The Art Course is designed to develop skills and practice in many areas of Art and Design. Creativity is a door to many exciting career opportunities, building skills such as problem solving, communication as well as developing the student's own visual language. Students will develop a portfolio of work that they can show to prospective employers or use to secure a place in higher education.

CONTENT AND ASSESSMENT

Students will develop a sketch book of work experimenting with a wide range of materials and processes. They will refine their drawing and painting skills and use photography to develop their ideas. Students will look at historical and contemporary Art sources to underpin their knowledge and understanding. All work will be appropriate to students' personal intentions and allow them to take ownership and really explore, in depth, themes that they connect with. These may include, mark-making, collage, assemblage, construction, textiles as well as digital working methods.

Assessment

The course is assessed through two projects over the two years of study.

Component 1) students will respond to a project brief and explore areas of Art and Design in response to this theme. They will realise their intentions by informed research, development and refinement of ideas. Written annotation will support this component. (worth 60% of final grade)

Component 2) (externally set assignment) Students will respond to a starting point set by the exam board. (worth 40% of final grade)

This response provides evidence of students' ability to work independently.

Course Content: Assessment objectives.

- AO1: Develop ideas through investigations demonstrating critical understanding of sources.
- A02: Refine work by exploring ideas, selecting and experimenting with appropriate materials, techniques and processes.
- A03: Record ideas, observations and insights relevant to intentions as work progresses.
- A04: Present a personal and meaningful response that realises intentions and demonstrates understanding of visual language.

BUSINESS STUDIES - GCSE

Awarding Body: OCR
Course Code: J204
QAN: 603/0295/1 - Click here for further information

OVERVIEW OF THE COURSE

GCSE in Business equips students with the skills and confidence to explore how different business situations affect decision-making. They develop their understanding of concepts, objectives and terminology, and the impact of contemporary issues on business operations. The qualification is linear, meaning that students will sit all their exams at the end of the course.

CONTENT AND ASSESSMENT

Paper 1 – 1 hour 30 minutes exam out of 80 marks worth 50% of total GCSE

Business Activity - In this section, learners explore how and why businesses start and grow.

Marketing - In this section, learners explore the purpose and role of marketing within business and how it influences business activity and the decisions businesses take.

People - In this section, learners explore the purpose and role of human resources within business and how it influences business activity and the decisions businesses take.

Paper 2 – 1 hour 30 minutes exam out of 80 marks worth 50% of total GCSE

Operations - In this section, learners explore what business operations involve, their role within the production of goods and the provision of services, and how they influence business activity.

Finance - In this section, learners explore the purpose of the finance function, its role in business and how it influences business activity.

Influences on business - In this section, learners explore the importance of external influences on business and how businesses change in response to these influences.

The interdependent nature of business - In this section, learners will need to use content from both component 01 and component 02 to make connections between different elements of the subject. They will need to draw together knowledge, skills and understanding from different parts of the GCSE course and apply their knowledge to business decision making within a business context.

Both papers consist of a combination of multiple choice, short, medium and extended response style questions. The short, medium and extended response style questions use stimulus material that draws on real business contexts.

COMPUTER SCIENCE - GCSE

Awarding Body: OCR
Course Code: J277
QAN: 601/8355/X - Click here for further information

OVERVIEW OF THE COURSE

Computer Science is engaging and practical, encouraging creativity and problem solving. Students develop their understanding and application of the core concepts in computer science such as computational thinking and designing, writing, testing and evaluating programs. Students will also learn about the internal components of a PC including the CPU, storage devices, operating systems, and how binary is used to create instructions and represent data.

CONTENT AND ASSESSMENT

Paper 1 – 1 hour 30 minutes exam worth 50% of the final grade.

- Systems architecture - CPU and PC components
- Memory and storage - RAM, ROM, HDD, SSD, cloud storage
- Computer networks, connections and protocols
- Network security and common cyber attack prevention
- Systems software - including operating systems and utilities
- Ethical, legal, cultural and environmental impacts of digital technology

Paper 2 – 1 hour 30 minutes exam worth 50% of the final grade.

- Standard algorithms for searching and sorting
- Programming fundamentals - sequence, selection, iteration, and data types
- Producing robust programs - checking inputs and data types, anticipating errors
- Boolean logic - AND, OR, NOT gates
- Programming languages and Integrated Development Environments - Python in Pyscripter

CREATIVE iMEDIA - CAMBRIDGE NATIONAL

Awarding Body: OCR
Course Code: J817
QAN: 600/7043/2 - Click here for further information

Units	Marks	Assessment Duration	GLH*	Assessment format
Creative media in the media industry	70	1h30	48	Written paper, OCR set and marked
Visual identity and digital	50	10 to 12 hours	30	Centre-assessed tasks, OCR moderated
Interactive digital media	70	10 to 12 hours	42	Centre-assessed tasks, OCR moderated

*GLH (guided learning hours) is the approximate time that the teacher will spend supervising or directing study time and assessment activities.

CONTENT Overview

R093: Creative iMedia in the media industry

In this exam unit you will learn about the media industry, digital media products, how they are planned, and the media codes which are used to convey meaning, create impact and engage audiences. Topics include:

- o The media industry
- o Factors influencing product design
- o Pre-production planning
- o Distribution considerations

R094: Visual identity and digital graphics

In this assignment unit you will learn how to develop visual identities for clients and use the concepts of graphic design to create original digital graphics to engage target audiences. Topics include:

- o Develop visual identity
- o Plan digital graphics for products
- o Create visual identity and digital graphics

R097: Interactive digital media

In this assignment unit you will learn how to plan, create and review interactive digital media products. Topics include:

- o Plan interactive digital media
- o Create interactive digital media
- o Review interactive digital media

ELECTRONICS - GCSE

Awarding Body: WJEC
Course Code: 4160 (4161, 4162, 4163)
QAN: 603/0776/6 - Click here for further information

OVERVIEW OF THE COURSE

Studying this GCSE in Electronics enables learners to develop scientific knowledge and conceptual understanding of the behaviour of analogue and digital electrical/electronic circuits including a wide range of electronic components. Develop an understanding of the nature, processes and methods of electronics as an engineering discipline to help them answer questions about practical circuits and be aware of new and emerging technologies. Develop and learn how to apply observational, practical, problem solving and evaluative skills in the identification of needs in the world around them and to propose and test electronic solutions.

CONTENT AND ASSESSMENT

Discovering Electronics: External Exam – 1 hour 30 minutes, 40% of the GCSE.

1. Electronic systems and subsystems
2. Circuit concepts
3. Resistive components in circuits
4. Switching circuits
5. Applications of diodes
6. Combinational logic systems

Application of Electronics: External Exam – 1 hour 30 minutes, 40% of the GCSE.

1. Operational amplifiers
2. Timing circuits
3. Sequential systems
4. Interfacing digital to analogue circuits
5. Control circuits

Extended system design and realisation task – Coursework (Non-exam assessment, NEA) 20% of the GCSE.

This component requires each learner to produce a single extended system design and realisation task independently. The task builds on the systems developed throughout the specification and the requirement to relate practical circuit design and construction to knowledge and understanding gained from the examinations. This component requires learners to demonstrate their ability to analyse a problem to enable solutions to be developed by developing a design specification to solve the problem, design and build an electronic system, model its performance against the design specification and modify as appropriate.

ENGINEERING DESIGN - CAMBRIDGE NATIONAL

Awarding Body: OCR
Course Code: J822
QAN: 603/7086/5 - Click here for further information

OVERVIEW OF THE COURSE

Our Cambridge National in Engineering Design helps students understand the processes of 2d and 3d engineering design techniques. Through practical activities students develop skills in computer modelling and model making and how to communicate design ideas effectively.

CONTENT AND ASSESSMENT

Unit	Unit title	Guided learning hours	Assessment type
R038	Principles of engineering design	48	Exam (1h 15mins)
R039	Communicating designs	36	Centre-assessed tasks, OCR moderated
R040	Design evaluating and modelling	36	Centre-assessed tasks, OCT moderated

R038 Principles of engineering design (worth 40% of final grade)
In this unit you will learn about the different design strategies and where they are used, as well as the stages that are involved in iterative design, which is currently one of the most widely used design strategies. You will learn about the type of information needed to develop a design brief and specification, and the manufacturing and other considerations that can influence a design. You will develop knowledge of the types of drawing used in engineering to communicate designs, as well as the techniques used to evaluate design ideas and outcomes, including modelling methods.

Coursework: worth 60% of the final grade consisting of 2 pieces of coursework
R039 Communicating designs
In this unit you will learn how to develop your techniques in sketching, and gain industrial skills in engineering drawing using standard conventions that include dimensioning, line types, abbreviations, and representation of mechanical features. You will enhance your confidence and capabilities by using computer aided design (CAD), 2D and 3D software, to produce accurate and detailed drawings and models that visually communicate your designs.

R040 Design evaluating and modelling
In this unit you will learn how designers can quickly create and test models to develop a prototype of a design. You will develop your virtual modelling skills using computer aided design (CAD) 3D software, to produce a high-quality model that will be able to simulate your design prototype. You will also develop your physical modelling skills using modelling materials or rapid prototyping processes to produce a physical prototype.

ENGINEERING MANUFACTURE - CAMBRIDGE NATIONAL

Awarding Body: OCR
Course Code: J823
QAN: 603/7087/7 - Click here for further information

OVERVIEW OF THE COURSE

Our Cambridge National in Engineering Manufacture develops students' understanding of the processes involved in transferring a design concept into a product. They apply their knowledge and skills by operating manufacturing equipment following a design specification, using tools such as CAD/CAM.

CONTENT AND ASSESSMENT

Unit	Unit title	Guided learning hours	Assessment type
R014	Principles of engineering manufacture	48	Exam (1h 15mins)
R015	Manufacturing a one-off product	36	Centre-assessed tasks, OCR moderated
R016	Manufacturing in quantity	36	Centre-assessed tasks, OCT moderated

R014 Principles of engineering manufacture (worth 40% of final grade)

This unit introduces students to manufacturing processes such as shaping, forming, joining and finishing processes. These include techniques such as die casting, press forming metal, 3d printing, brazing and painting, to name just a few.

Students go on to learn about different materials from metals to thermochromic pigment, and the suitability for different manufacturing applications. The third topic area relates to manufacturing requirements and how to interpret orthographic third angle projection drawing. The fourth topic relates to developments in engineering manufacture from Just In Time manufacturing to impacts of globalisation.

Coursework: worth 60% of the final grade consisting of 2 pieces of coursework
R015 Manufacturing a one-off product
In this unit students learn to identify the information required to make a product, plan the production of a product and carry out risk assessments for the processes, tools and equipment needed to produce a product in small quantities. You will also learn how to select and safely use the equipment, processes and tools required to mark out, measure and manufacture a product in small quantities, using a range of handheld equipment and conventional (non-Computer Numerical Control (CNC) machining methods.
R016 Manufacturing in quantity
In this unit students learn how to manufacture and use simple jigs and templates to support manufacturing in volume. By using CAD software you will learn about the information needed to facilitate manufacture, and apply this in order to program Computer Numerical Control (CNC) equipment. In addition, you will learn how to set up and operate the CNC equipment and monitor the quality of the manufactured products.

ENGLISH LANGUAGE - GCSE

Awarding Body: AQA
Course Code: 8700
QAN: 601/4292/3 - Click here for further information

OVERVIEW OF THE COURSE

English Language is a linear course where students sit all of their exam papers at the end of Year 11. Students are introduced to fiction and non-fiction extracts that they will be asked to explore. One of the non-fiction extracts will be from the 19th century. This qualification will enable students to develop their analytical and creative skills whilst incorporating a variety of genres, audiences, viewpoints and perspectives. This course of study is at the heart of their learning journey and will equip them with a range of reading and writing skills that are valued by employers and colleges alike.

CONTENT AND ASSESSMENT

Paper 1 – Explorations in Creative Reading and Writing

Written exam: 1 hour 45 minutes, worth 50% of the GCSE.

Section A: Reading - One literature fiction text
Section B: Writing - Descriptive or narrative writing

Paper 2 – Writers' Viewpoints and Perspectives

Written exam: 1 hour 45 minutes, worth 50% of the GCSE.

Section A: Reading - One non-fiction text and one literary non-fiction text
Section B: Writing - Writing to present a viewpoint

Non Examination Assessment – Spoken Language.
(Students will receive a certificate of pass, merit or distinction)

Presenting
Responding to questions and feedback
Use of Standard English
Teacher set throughout course
Marked by teacher
Separate endorsement (0% weighting of GCSE)

ENGLISH LITERATURE - GCSE

Awarding Body: AQA
Course Code: 8702
QAN: 601/4447/6 - Click here for further information

OVERVIEW OF THE COURSE

English Literature is a linear course where students sit all of their exams at the end of Year 11. Students will be introduced to a range of genres over time. It is an academic course of study, which will take students on a journey through the Elizabethan period to modern day poetry. This qualification will enable students to develop a deeper understanding of the written word and will equip them with a range of reading and writing skills that are valued by employers and colleges alike.

CONTENT AND ASSESSMENT

Paper 1 – Shakespeare and the 19th Century Novel

Macbeth (Shakespeare)
A Christmas Carol (Charles Dickens)

Section A: Shakespeare – Students will answer one question on their play. They will be required to write in detail about an extract from the play and then to write about the play as a whole.
Section B: The 19th-century novel – Students will answer one question on their novel. They will be required to write in detail about an extract from the novel and then to write about the novel as a whole.

Written exam: 1 hour 45 minutes, worth 40% of GCSE.

Paper 2 – Modern Texts and Poetry

An Inspector Calls (J.B Priestley)
Poetry Anthology (Power and Conflict)

Section A: Modern texts – Students will answer one essay question from a choice of two on their studied drama text.
Section B: Poetry – Students will answer one comparative question on one named poem printed on the paper and one other poem from their anthology cluster.
Section C: Unseen poetry – Students will answer one question on one unseen poem and one question comparing this poem with a second unseen poem.

Written exam: 2 hours 15 minutes, worth 60% of GCSE.

MATHEMATICS - GCSE

Awarding Body: AQA
Course Code: 8300
QAN: 601/4608/4 - Click here for further information

OVERVIEW OF THE COURSE

In this course you will develop your knowledge and understanding of mathematical methods and concepts. You will use these to make connections and apply the functional elements of mathematics in everyday and real-life situations. You will acquire and use skills such as problem-solving strategies, selecting and applying mathematical techniques and methods, mathematical reasoning, making deductions and inferences, drawing conclusions, as well as interpreting and communicating mathematical information in a variety of forms appropriate to the information and context.

CONTENT AND ASSESSMENT

The course content can be split into six key subject areas:

- Number
- Algebra
- Ratio, Proportion and Rates of Change
- Geometry and Measures
- Probability
- Statistics

Assessment is in the form of externally assessed written exams, taken in the summer of Year 11.

- Three written papers: each contributing 33.3% of the final grade.
- Tiered papers:
  - Foundation: Tier grades 1 - 5 available.
  - Higher: Tier grades 4 - 9 available.
- Each paper lasts 1 hour 30 minutes, with 80 marks on each paper.

GCSE 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 things such as the management of money and of course, interpreting and working with numbers in engineering.

SCIENCE (COMBINED) - GCSE

Awarding Body: AQA
Course Codes: 8464
QAN: 601/8758/X - Click here for more information

OVERVIEW OF THE COURSES

Students taking combined science will study to achieve two full GCSEs over their two years of study. They will study a combination of biology, chemistry and physics. These qualifications are linear, which means that students will sit all their exams at the end of the course.

CONTENT AND ASSESSMENT

BIOLOGY	CHEMISTRY	PHYSICS
1. Cell biology 2. Organisation 3. Infection and response 4. Bioenergetics 5. Homeostasis and response 6. Inheritance, variation and evolution 7. Ecology	1. Atomic structure and the periodic table 2. Bonding, structure, and the properties of matter 3. Quantitative chemistry 4. Chemical changes 5. Energy changes 6. The rate and extent of chemical change 7. Organic chemistry 8. Chemical analysis 9. Chemistry of the atmosphere 10. Using resources	1. Energy 2. Electricity 3. Particle model of matter 4. Atomic structure 5. Forces 6. Waves 7. Magnetism and electromagnetism

Exams

There are six papers: two biology, two chemistry and two physics. Each of the papers will assess knowledge and understanding from distinct topic areas. There is no coursework in science at GCSE. However, for each of the subjects, students are expected to be familiar with 12 required practicals. Questions will be asked about these practicals in examinations.

SCIENCES (TRIPLE) - GCSE

Awarding Body: AQA
Course Codes: Biology 8461, Chemistry 8462 and Physics 8463
QAN: 601/8752/9, 601/8757/8, 601/8751/7 - Click here for more information

OVERVIEW OF THE COURSES

Students taking triple science will achieve three full GCSEs in biology, chemistry and physics over their two years of study. They will gain further understanding and depth of knowledge compared to students choosing to take combined science, and will be at an advantage for post 16 studies in the sciences. These qualifications are linear, which means that students will sit all their exams at the end of the course.

CONTENT AND ASSESSMENT

BIOLOGY	CHEMISTRY	PHYSICS
1. Cell biology 2. Organisation 3. Infection and response 4. Bioenergetics 5. Homeostasis and response 6. Inheritance, variation and evolution 7. Ecology	1. Atomic structure and the periodic table 2. Bonding, structure, and the properties of matter 3. Quantitative chemistry 4. Chemical changes 5. Energy changes 6. The rate and extent of chemical change 7. Organic chemistry 8. Chemical analysis 9. Chemistry of the atmosphere 10. Using resources	1. Energy 2. Electricity 3. Particle model of matter 4. Atomic structure 5. Forces 6. Waves 7. Magnetism and electromagnetism 8. Space physics

For each of the science GCSEs students will sit two 1hr 45 minute papers. Each of the papers will assess knowledge and understanding from distinct topic areas. There is no coursework in science at GCSE. However, for each of the subjects, students are expected to be familiar with 12 required practicals. Questions will be asked about these practicals in examinations.

FURTHER MATHS (ENRICHMENT) - GCSE

Awarding Body: AQA
Course Code: 8365
QAN: 603/3104/5 - For further information please click here

OVERVIEW OF THE COURSE

AQA Level 2 Further Maths GCSE is a unique qualification designed to stretch and challenge high achieving mathematicians who are expected to achieve the top grades in GCSE Mathematics and are likely to progress to study A-level Mathematics and Further Mathematics. It is only offered as an extra-curricular qualification and is studied by invitation only.

High-achieving students are introduced to AS topics that will help them develop skills in algebra, geometry, calculus, matrices, trigonometry, functions and graphs. The course includes topics which will be familiar through their previous studies in mathematics, but also introduces more abstract and unfamiliar topics such as matrices.

CONTENT AND ASSESSMENT

Assessment
The course is assessed through two exams, both of which are 1 hour and 45 minutes.
Paper 1 is non-calculator, paper 2 requires a calculator
Any content from the course can appear on either paper

Content

1. Number
- Combinatorics
- Surds

2. Algebra
- Polynomial Algebra
- Functions
- Simultaneous Equations
- Laws of Indices
- Sequences

3. Coordinate Geometry
- Equation of a straight line
- Equation of a circle

4. Calculus
- Differentiation of polynomials
- Finding gradients of tangents and normal
- Finding higher derivatives
- Finding minima and maxima

5. Geometry
- Geometric Proof
- Trigonometry
- Pythagoras's theorem
- Trigonometric graphs

6 Matrices
- Arithmetic with matrices
- Transformations of the plane