



GREATER  
PETERBOROUGH  
**UTC**



# KS5 OPTIONS BOOKLET

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**2018 – 2020**

## Welcome

You are preparing to join the third cohort of Greater Peterborough UTC students. It is going to be a great school to be a part of and you will be among the first students who get the opportunity to work with us to make that happen.

It has been good to meet you already and I hope the chance to meet our employer sponsors and partners, our staff and students - coupled with a look round the UTC building - has inspired you and got you looking forward to September. You will have a range of questions about what life at the UTC will be like. Before you join us in September we will be answering those questions during our Taster Days, Student Induction and Information events and using documents such as this Options Booklet.

At Greater Peterborough UTC we recognise the importance of the decisions that students need to make as they decide to join us. In this important and challenging phase of students' education, it is crucial that we give you clear and informed guidance as to the choices available and how these are matched to individual needs, interests and abilities. The courses we have chosen ensure that students can study the breadth of subjects that is both required and ideal, but also can study A Levels which directly support one or both of our specialisms. We want to ensure that parents and students are fully informed of the issues involved in choosing courses for Years 12 and 13.

Our industry partners and sponsors have worked to define exactly what attributes, skills and experiences are required of the future workforce in the engineering and built environment sectors. Greater Peterborough UTC will offer a curriculum and ethos where students can develop the required additional skills to fill these requirements. For 2018 – 2020 we are building on our second year and offering an exciting range of courses, in addition to the fantastic enhancement and enrichment opportunities that will provide the springboard for our students' development and shape their future educational and career opportunities.

We also see this as a time to reinforce the partnership that exists between the school, partners, parents and students. We value this partnership as we feel that it is vital in ensuring that students commit themselves, unequivocally, to the hard work that will enable them to successfully meet the challenges of new courses in Years 12 and 13.

If you have any questions about the information in this booklet, our staff will be pleased to offer any guidance that you may require and to discuss with you the opportunities which are available.

On behalf of the Greater Peterborough UTC team



Steve Warburton MA (Oxon), MBA, NPQH

Principal & CEO

## The Sixth Form (KS5) Curriculum

### Key Stage 5 Overview

#### Technical Specialism Courses at Level 3

Engineering

Built Environment

#### Technical Specialism Courses at Level 2

Engineering

### A-level Options

Mathematics

Further Mathematics

Geography

Business Studies

Chemistry

Computer Science

Art & Design

Cyber-Security

Biology

Physics

Product Design

Extended Project Qualification

### Additional Opportunities

Health & Safety at Work

Active lifestyle – including Sport

Careers Information, Advice & Guidance

Work Experience

Projects to develop the students' employability and business skills that could contribute to the potential award of a Silver and Gold Duke of York Award for Technical Education:

- Team working
- Problem solving
- Creativity
- Leadership
- Communication skills
- Resilience
- Responsiveness
- Persistence

## ENGINEERING

### BTEC LEVEL 3 NATIONAL DIPLOMA IN ENGINEERING (EQUIVALENT TO 2 A-LEVELS)

#### Course Description

The BTEC Level 3 National Diploma in Engineering is an advanced program, equivalent in size to two A-Levels. 10 units are completed by the learners within the program here at GPUTC. **Learners who apply for this programme must have obtained a Grade 6 or higher in Mathematics and Science.**

Learners gain the relevant skills and knowledge from studying a range of content focused on electrical/electronic and mechanical disciplines, whilst being expected to demonstrate the appropriate behaviors of an Engineer. The qualification has been designed by BTEC to be the substantive part of a 16–19 study programme for learners who want a strong core of sector study and a focus on the wider engineering industry. It is complemented here at GPUTC with two other A Levels to support progression to apprenticeships, specific job roles or to higher education courses within engineering.

#### Course Outline

The BTEC Level 3 National Diploma in Engineering is delivered across two academic years and broken down in the table below. For further details on the curriculum and guided learning hours, please visit [www.qualifications.pearson.com](http://www.qualifications.pearson.com).

#### Year 1

Unit Title	Brief Outline
Engineering Principles	<i>Learners apply mathematical and physical science principles to solve electrical, electronic and mechanical based engineering problems</i>
Engineering Product Design and Manufacture	<i>Learners will explore engineering product design and manufacturing processes; completing activities that consider function, sustainability, materials, form and other influencing factors.</i>
Applied Commercial and Quality Principles in Engineering	<i>Learners explore commercial engineering, key business activities, cost control, quality systems &amp; value management used by engineering organisations to create value</i>
Computer System Principles and Practice	<i>Learners will understand how computers operate securely as part of a system and will also develop a computer program to solve an engineering problem that is onscreen.</i>
Computer Aided Design (CAD) in Engineering	<i>Learners develop both 2D and 3D drawings and models using a CAD system</i>

**Year 2**

<b>Unit Title</b>	<b>Brief Outline</b>
<b>Computer Aided Manufacturing and Planning</b>	<i>Learners examine manufacturing-process automation and planning using computer software and technology. Learners will simulate the manufacture of a component</i>
<b>Delivery of Engineering Processes Safely as a Team</b>	<i>Learners explore how processes are undertaken by teams to create engineered products or to deliver engineering services safely</i>
<b>A Specialist Engineering Project</b>	<i>Learners apply project-management principles to undertake a 30-hour individual project and will produce a product, system or process relevant to their specialist area of study</i>
<b>Electronic Devices and Circuits</b>	<i>Learners explore the operation of electronic devices and their uses in circuits through simulation and practical exercises to build and test physical analogue and digital circuits</i>
<b>Thermodynamics Principles and Practices</b>	<i>Learners will investigate and conduct tests into thermodynamic principles, consider the applications of the principles and explore energy transfer in thermodynamic systems</i>

**Future**

This qualification could lead to employment through an apprenticeship in engineering such as Higher Apprenticeships in Manufacturing Engineering, Power Engineering or Engineering Environmental Technologies. It could also lead directly to employment in engineering roles; in electrical and electronic engineering, mechanical engineering and design, automation, systems and control and manufacturing. As part of an academic study programme, it could also form part of the learner’s basis for application to a higher education course in Engineering, alongside complementary subjects, such as A-Levels in Maths, Physics or other relevant subjects.

## ENGINEERING

### AQA LEVEL 3 FOUNDATION TECHNICAL LEVEL ENGINEERING (EQUIVALENT TO 1 A-LEVEL)

#### Course Description

These qualifications are Advanced (Level 3) Technical qualifications, parity with A-levels and have been built in close collaboration with employers and professional bodies ensuring that they have both recognition and value. They are for learners over the age of 16 who wish to specialize or progress into a specific sector or specific occupational group, through advanced/higher apprenticeships, further study or employment. The AQA accredited Level 3 Foundation Technical Level Engineering course is made up of four mandatory units which are detailed below. All units must be completed to achieve the full qualification. At GPUTC the theoretical study is fully complimented with practical experiences. For further details on curriculum or guided learning hours please visit [www.aqa.org.uk](http://www.aqa.org.uk).

#### Course Outline

##### Year 1

Unit Title	Brief Outline
<b>Material, Technology and Science</b>	<i>To develop learners' understanding of the materials used in engineering products and the scientific principles engineers use to identify which materials are the most suitable for use in a given engineering context</i>
<b>Mechanical Systems</b>	<i>To give learners a practical understanding of mechanical systems. This includes different types of mechanical systems and their typical applications, how these systems are designed, and how they and their component parts function</i>

##### Year 2

Unit Title	Brief Outline
<b>Engineering Design</b>	<i>Learners who complete this unit will develop an understanding of the engineering design process and will use industry standard tools and techniques to deliver an engineering design from start to finish</i>
<b>Production and Manufacture</b>	<i>To provide learners with an understanding of the range of manufacturing processes and systems relevant to the production of multiple components. The learner will develop a production plan, schedule the production and work as part of a team to manufacture the batch of products</i>

#### Future

Successful completion of this course will allow the learner to demonstrate to future employers or further training providers an understanding around the Engineering curriculum enabling them to pursue an Apprenticeship.

## ENGINEERING

### LEVEL 2 ENGINEERING DEVELOPMENT PROGRAMME

#### Course Description

The aim for this programme is to enable students to be prepared for either future Level 3 study or an Advanced (L3) Apprenticeship. Students will be accepted onto this programme via a minimum of 24 GCSE points (from their top 8 grades), aptitude testing and interviews.

#### Course Outline

The Level 2 qualification consists of the following:

- Level 2 Engineering
- GCSE Physics Resit
- GCSE Maths Resit
- GCSE English Language Resit
- Level 2 Enterprise and Business
- Work Experience up to 20 days during the course of the year

#### Future

Students who are accepted onto the Level 2 programme will be able to apply for an apprenticeship within the engineering sector or alternatively progress onto a Level 3 programme of study.

## BUILT ENVIRONMENT

### LEVEL 3 TECHNICAL DIPLOMA IN CONSTRUCTING THE BUILT ENVIRONMENT

#### Description

Students taking this Diploma will gain a broader understanding of the fundamental principles of the Built Environment and develop a wide range of practical engineering skills. Over the span of two years students will have the opportunity to study a breadth of modules providing them with the theoretical knowledge and understanding around subjects such as Construction, Surveying, Architecture and Design.

There are a choice of 9 or 12 module pathways available to study on this course. The different blends of modules will give you a qualification at Level 3, which can equate to either 1.5 or 2 A Levels. Both pathways serve as the broadest foundation possible for a career in Construction and the Built Environment, including Higher-Level Apprenticeships and Degree courses. To supplement the Technical Diploma students will also have focused practical skills training that will give them additional hands-on experience in the UTC workshops and on-site with our Partners.

#### Course Outline

Students studying the Built Environment will study the following modules:

- Domestic Construction Technology
- Industrial and commercial construction technology
- Health and safety in the built environment
- Construction site supervision
- Construction science and materials
- Measurement tendering and estimating
- Site surveying
- Graphical communication
- Sustainability and new technologies
- Architectural design and planning
- Mathematics in the Built Environment
- Building regulations

#### Assessment

The highest grading for the Diploma is Distinction\*/Distinction\*, with lower grades being Distinction, Merit and Pass (and combinations e.g. Distinction/Merit).

Every unit achieved will be graded as pass, merit, or distinction. The points earned through these grades will enable an overall grade to be allocated when all 9/12 modules have been completed.

These qualifications are assessed using a combination of:

- External Assessment: These are end of course exams taken in March of Year 13 on core elements of the course and are marked by the exam board
- Internal Assessment: The Synoptic Assignments draw the entire course together in response to a case study that students write up over a set number of hours. The internal assessment is assessed and externally moderated by the exam board.

## Future

These qualifications are designed for learners who are interested in pursuing a career in the Built Environment industry. Professions could include Land Surveyor, Architect, Civil Engineer, Quantity Surveyor or a Construction Site Supervisor. As part of an academic study programme, it could also form part of the student's basis for application to a higher education course in construction-related disciplines, alongside complementary subjects, such as A levels in Maths, Geography, Business Studies, Art & Design and Product Design.



Students taking this Diploma will gain a broader understanding of the fundamental principles of the Built Environment and develop a wide range of practical engineering skills. It takes 720 guided learning hours (GLH) to deliver so it is a similar size to two A levels and can be taken in two years.

Those intending to study Engineering at University should choose the full **12**-module Diploma. This course group will work alongside the full Diploma group who will only complete **9** modules (540 Guided Learning Hours). It could be an option for students who are very keen on doing two A-levels as well as the EPQ and are directly aiming for University or as an option for students who want to focus their learning on a more limited curriculum in order to guarantee success. The decision to opt for the Foundation Diploma does not have to be made until Year 13.

## EXTENDED PROJECT QUALIFICATION (EPQ)

### Course Description

Undertaking an Extended Project can support your application to Higher Education by:

- Reducing the level of an offer
- Giving your application preference, on highly selective courses over students who have not undertaken EPQ
- Providing a focus for valued content within your personal statement
- Providing a major focus for interview discussion

Employers also respond favorably to candidates that have undertaken the EPQ qualification because of the skills developed throughout its process, which they deem necessary in the real world of work. It also demonstrates that you can manage yourself and resources to meet a set criteria and deadline, something most employers find as a valuable set of skills.

Students are required, with appropriate supervision, to:

- Choose an area of interest
- Draft a title and aims of the project for formal approval by the centre
- Plan, research and carry out the project
- Deliver a presentation to a non-specialist audience
- Provide evidence of all stages of project development and production for assessment.

Students will be allocated a supervisor to oversee and guide them through the project.

### Assessment

**MANAGE** - 20% this looks at how you plan and manage the project

**USE RESOURCES** - 20% this will look at your 'use of resources'

**DEVELOP AND REALISE** - 40% this will look at how you developed your ideas and concepts

**REVIEW** - 20% shows your ability to reflect on what you have gained from the process in terms of strengths and areas for further development

Students must complete the following to obtain the EPQ:

- A project log which details how they have planned, researched and evaluated their project
- A project which includes either a written report of no less than 5,000 words, or as an artefact with a supporting report of no less than 1,000 words
- Presentation to a non specialist audience of the process followed and the outcomes produced

## ART & DESIGN A-LEVEL

### Course Description

The 2-year course has a strong emphasis on developing a range of different skills, using a wide range of traditional and modern approaches in conjunction with the technical facilities and specialism GPUTC has to offer. Throughout the course, strong visual and written research skills form the basis to analysis the work of other artists, designers, cultures and art forms. The Art, Craft and Design route allows students to work with existing skills and develop these further by combining different areas of study.

### Course Outline

The course consists of a minimum of 2 units of coursework to create the personal portfolio including a sustained project. The purpose of coursework units is to provide students with the opportunity to research develop and realise 2D/3D ideas. Students must include at least 2 areas of study from the following areas during their course:

- Fine Art
- Textile Design
- Graphic Communication
- Three Dimensional Design
- Photography

### Example 1

A student may research chosen architects and associated selected buildings, develop and realise own interpretation, creating a three dimensional model in combination with photography, to add realism and show different aspects of the design.

### Example 2

Alternatively, a student may wish to explore techniques to combine fine art / graphic design and textiles to create a unique outcome in the form of a contemporary decorative item or soft furnishing piece for a client.

### Example 3

Using photography in combination with fine art techniques has been explored in a variety of ways by contemporary artist and designers. A student may wish to use first hand photographic images of the natural or build environment / human form, to explore and manipulate in order to reflect current issues in society.

### Assessment

#### Component 1: Coursework portfolio / no time limit - worth 60 % of the GCSE:

- Clear evidence for all 4 assessment objectives (Develop/ refine/ record/ present)
- Themes for the personal portfolio will be set and marked by subject staff to reflect UTC specialisms

#### Component 2: Externally set assignment (ESA) worth 40% of the GCSE

- Students respond to their chosen starting point from an externally set assignment paper
- 10 week preparatory period; sketchbooks, research, experimentation, drafts, mock-ups produced
- Final exam—10 hours supervised (2 school days) - takes place before main exam period

### Future

A level Art & Design dovetails very well with both the Level 3 Technical courses, and students interested in a Degree in Architecture should particularly consider it, as well as those who want to go on and specialise in Design-related courses and careers.

**BIOLOGY A-LEVEL****Course Description**

Students of the A level in Biology will develop their knowledge and understanding of different areas of biology and how they relate to each other. They will explore how society makes decisions about biology-related issues and how biology contributes to the success of the economy and society.

The course is designed to enable students to develop:

- essential knowledge and understanding of different areas of the subject and how they relate to each other
- demonstrate a deep appreciation of the skills, knowledge and understanding of scientific methods
- competence and confidence in a variety of practical, mathematical and problem-solving skills
- understanding of how society makes decisions about scientific issues and how the sciences contribute to the success of the economy and society.

**Course Outline**

Biological Molecules	Microbiology and Pathogens	Energy for Biological Processes
Modern Genetics	Ecosystems	Classification and Biodiversity
Exchange and Transport	Origins of Genetic Variation	Control Systems
	Cells, Viruses and Reproduction of Living Things	

Students will build on practical skills learned at GCSE, becoming confident practical biologists, handling apparatus competently and safely. Using a variety of apparatus and techniques, they should be able to design and carry out both the core practical activities and their own investigations, collecting data which can be analysed and used to draw valid conclusions.

**Assessment**

As well as end-of-course examinations, there will also be an extensive practical-based assignment.

**Future**

Biology A level gives a greater understanding to the world around you and fits well with engineering and built environment. It is an essential course for anyone wishing to pursue biomedical engineering and the course gives insight into biological systems which are often the inspiration for engineering and built environment structures.

## BUSINESS STUDIES A-LEVEL

### Course Description

Level 3 Advanced GCE in Business enables students to:

- Develop an enthusiasm for studying business
- Gain an holistic understanding of business in a range of contexts
- Develop a critical understanding of organisations and their ability to meet society's needs and wants
- Understand that business behaviour can be studied from a range of perspectives
- Generate enterprising and creative approaches to business opportunities, problems and issues
- Be aware of the ethical dilemmas and responsibilities faced by organisations and individuals
- Acquire a range of relevant business and generic skills, including decision making, problem solving, the challenging of assumptions and critical analysis
- Apply numerical skills in a range of business contexts.

### Course Outline

The course is based around 4 key themes, looking at different types of business ranging from small and medium enterprises to national and international organisations. The emphasis will be on what is important for businesses, what the consequences of their actions are and why these differ depending on size.

Theme 1: Marketing and People Theme

Theme 2: Managing business activities

Theme 3: Business decisions and strategy

Theme 4: Global business

### Assessment

35% Paper 1: Marketing, people and global businesses assesses Themes 1 and 4

35% Paper 2: Business activities, decisions and strategy assesses Themes 2 and 3

30% Paper 3: Investigating business in a competitive environment is synoptic and covers all 4 themes

In addition, Paper 3 follows a pre-released context that is released in November, which students research as part of the preparation of this examination.

### Future

Taking 'A' level Business Studies will allow you to broaden your understanding of the Engineering and Built Environment sectors, which we will use as some of the case studies to support the course material. It will be a useful foundation material for any future career or study related to management in these sectors.

## CHEMISTRY A-LEVEL

### Course Description

Some people regard Chemistry as the 'Central Science' because of its links with the other natural sciences. The course focuses on the composition, structure, properties and change of matter, including topics such as the properties of individual atoms, how atoms form chemical bonds to create chemical compounds, the interactions of substances through intermolecular forces that give matter its general properties, and the interactions between substances through chemical reactions to form different substances.

### Course Outline

- Development of practical skills
- Core organic chemistry
- Foundations in chemistry
- Physical chemistry and transition elements
- Periodic table and energy
- Organic chemistry and analysis

Practical work is central to any study of chemistry. For this reason, we included Practical Endorsement practical activities, which form a thread linking theoretical knowledge and understanding to practical scenarios. By following this thread, students will build on practical skills learned at GCSE, become confident practical chemists and handling apparatus competently and safely.

### Assessment

To demonstrate their knowledge, students should be able to undertake a range of activities, including the ability to recall, describe and define, as appropriate. To demonstrate their understanding, students should be able to explain ideas and to use their knowledge to apply, analyse, interpret and evaluate, as appropriate. Practical Endorsement will be assessed throughout the course.

### Future

Chemistry fits well with Engineering as the properties of materials used in Engineering depend on their chemical make-up and Chemistry will help you get ahead in most STEM (Science, Technology, Engineering & Maths) careers. Chemistry is an important subject for careers in: medicine, environmental science, engineering, toxicology, developing consumer products, metallurgy (studying how metals behave), space exploration, developing perfumes and cosmetics, pharmaceuticals, energy, teaching, science writing, software development and research.

## COMPUTER SCIENCE A-LEVEL

### Course Description

Computer Science is a practical subject where students can apply the academic principles learned in the classroom to real-world systems. It is an intensely creative subject that combines invention and excitement, that can look at the natural world through a digital prism.

### Course Outline

- Fundamentals of programming
- Theory of computation
- Web technologies
- Fundamentals of data structures
- Fundamentals of data representation
- Consequences of uses of computing
- Systematic approach to problem solving
- Fundamentals of computer systems
- Fundamentals of communication and networking
- Fundamentals of algorithms
- Fundamentals of databases and SQL Big Data
- Fundamentals of functional programming
- Non-exam assessment - the computing practical project

We generally use the python programming language with the option to use C# for the programming project. Students also have the opportunity to be earn a Cisco Academy Python Certified Associate Programmer certificate as part of the course.

### Assessment

Assessment 1: This paper tests a student's ability to program, as well as their theoretical knowledge of Computer Science.

Assessment 2: focuses on Computer Components, the Stored Program concept and the Internet, Problem Solving, Programming, Operating Systems, Databases and Networking

Assessment 3: Individual Project with output, plus a report written by the candidate documenting a programmed solution to a real problem associated with a user whose realistic needs should be taken into account when specifying, designing and implementing the solution.

### Future

This specification has been designed for students who wish to go on to higher education courses or employment – such as Engineering - where knowledge of Computing would be beneficial. One can study Computing and go on to a career in medicine, law, business, politics or any type of science.

## AQA CYBER SECURITY FOUNDATION TECHNICAL LEVEL

### Course Description

This new qualification has been designed for students who wish to enhance their skills in this exciting and fast growing sector of cyber security. The foundation Technical Level is equivalent to one A-level and the course will also allow students to earn a Cisco Networking Academy Certificate in Cyber-Operations. Students who wish to study the Cyber Security Course must also select A Level Computer Science.

### Course Outline

Fundamental principles of computing

- Computer hardware
- computer system software
- Data Processing

Communication Technologies

- Fundamentals of data communication
- Mobile Technologies
- Computer networking and common protocols

Developing and maintaining computer networks

- How we use networks
- Types of networking and how to design networking systems
- Testing and maintaining networks

Network Threats and vulnerabilities

- Network Security Testing (Penetration Testing)
- Network Security Analysis
- Designing and Applying Security Solutions

### Assessment

The Fundamental Principles of Computing and Communication technologies components are assessed via an examination paper. The “Computer networking” and “Network threats and vulnerabilities” components will be assessed via a project.

### Future

Studying this qualification will give you a variety of options to pursue a career in the Cyber Security and IT sector either through an apprenticeship or by moving into higher education.

## FURTHER MATHS A-LEVEL

### Course Description

A-level Further Mathematics is designed to broaden and deepen the mathematical knowledge and skills developed when studying A-level Mathematics. It may be studied alongside, or after taking A-level Mathematics, and provides a stimulating experience for those who enjoy the subject.

### Course Outline

Paper 1: Core Pure Mathematics

Paper 2: Core Pure Mathematics

Paper 3: Further Mathematics Options 1\*

\*Students take ONE of the following options:

- Further Mathematics 1
- Further Statistics 1
- Further Mechanics 1
- Decision Mathematics 1

### Assessment

All units are of equal weighting and are assessed by an exam of 1 hour 30 minutes available in the June series.

### Future

Studying both A-level Mathematics and A-level Further Mathematics provides a foundation for further studies in any Science or Maths-based course, ranging from Computer Science, Medical Sciences, and Psychology to Statistics, Management and Actuarial Science.

## GEOGRAPHY A-LEVEL

### Course Description

Geography encourages learners to develop a sense of wonder about the world which is relevant to any citizen of the planet in the 21st century. Through exciting topics learners will understand the nature of physical and human geography whilst unpicking the debates surrounding contemporary challenges facing the world today.

*“Where we come from, what we do, what we eat, how we move about and how we shape our future are all directly the province of the geographer. More than ever we need the geographer’s skills and foresight to help us learn about the planet – how we use it and how we abuse it.” – Michael Palin*

### Course Outline

Through the study of Physical systems (01) learners will develop an understanding and appreciation of Landscape Systems, contextualised through either coastal, dry land or glaciated landscapes and Earth’s Life Support Systems, which encompasses the water and carbon cycles vital to our planet.

Learners will explore Human interactions (02) through the study of Global Connections, with a choice between focusing on the systems of trade or migration and the governance of human rights or sovereignty on a global scale, and Changing Spaces; Making Places, which gives learners an insight into the nature of places and the fluidity of their meanings and representations.

Geographical debates (03) allows teachers and learners to explore in depth two from a choice of five of the most challenging, dynamic and fascinating issues of the 21st century. With choices between such wide-ranging topic areas as climate change, disease, food security, oceans and tectonic hazards, there are debates to appeal to all.

The Investigative geography (04/05) component allows learners to undertake an independent investigation linked to any aspect of the specification to satisfy their intellectual curiosity. This component is designed to encourage learners to deepen their knowledge and understanding of their chosen topic whilst developing a number of geographical and study skills relevant to Higher Education or within the world of work.

### Assessment

All elements of the course will be assessed by examination, except for the Investigative Geography component, and the independent investigation will consist of a written report which will assess the process of enquiry and investigation.

### Future

An A Level in Geography provides a background for many of the complex projects within the Engineering and Built Environment sectors. Both these industries are global in their scope and this background understanding would serve students and those with developing careers in these sectors well.

## MATHEMATICS A-LEVEL

### Course Description

A-level Maths provides students with a thorough grounding in the mathematical tools and techniques often needed in the workplace. The reason why so many employers highly value mathematics qualifications is mathematics students become better at thinking logically and analytically. Through solving problems you develop resilience and are able to think creatively and strategically. The logic and reasoning skills developed by studying A-level Maths make sure the qualification is widely respected even in non-mathematical arenas.

The course aims to encourage students to:

- develop their understanding of mathematics and mathematical processes in a way that promotes confidence and fosters enjoyment;
- develop abilities to reason logically and to recognise incorrect reasoning, to generalise and to construct mathematical proofs;
- extend their range of mathematical skills and techniques and use them in more difficult unstructured problems;
- recognise how a situation may be represented mathematically and understand the relationship between 'real world' problems and standard and other mathematical models and how these can be refined and improved;

### Course Outline

Paper 1: Pure Mathematics 1

Paper 2: Pure Mathematics 2

Paper 3: Statistics and Mechanics

### Assessment

All units are of equal weighting and are assessed by an exam of 2 hours. Statistics 1 has optional coursework worth 25 per cent of the unit with an accompanying exam of 1 hour 15 minutes sat in June.

### Future

There are Mathematics modules in the Level 3 Technical Diplomas which underlines just how important it is for future progress in those employment sectors. Mathematics is a versatile qualification, well-respected by employers and is a facilitating subject for entry to higher education. Good mathematics skills and qualifications give access to careers which are not only well paid, but they are also often interesting and rewarding.

## PHYSICS A-LEVEL

### Course Description

Physics is an exciting subject which aims to explain how things work from the smallest to the largest of scales, from nanotechnology to the universe itself. It takes in practice and theory, specialist pure research and applications in the surroundings of everyday life. It is no surprise that those with a physics degree are in demand by many employers. As a discipline, physics is used in many areas of professional activity including engineering, health and biomedicine, the public services and utilities, environmental monitoring, education, and computing.

### Course Outline

- Development of practical skills in physics
- Electrons, waves and photons
- Foundations of physics
- Newtonian world and astrophysics
- Forces and motion Particles and medical physics

### Assessment

There are three exams at the end of the two years for A-level;

- Modelling Physics (100 marks, 2 hours 15 mins)
- Exploring Physics (100 marks, 2 hours 15 mins)
- Unified Physics (70 marks, 1 hour 30 mins)

At least 15% of the marks for A-level Physics are based on what you learned in your practicals. You will also receive a pass/fail mark for Practical Endorsement which is assessed in college throughout the course.

### Future

Physics A level is a requirement for any Physics based course such as Physics, Astrophysics, Material Science or Medical Physics. There are also many career paths that stem from the study of Physics, including Engineering, Forensics, Robotics and Music Technology. Note that most Physics degree courses require Maths A level as well as Physics

## PRODUCT DESIGN A-LEVEL

### Course Description

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.

Students will investigate historical, social, cultural, environmental and economic influences on design and technology, whilst enjoying opportunities to put their learning in to practice by producing prototypes 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. Imaginative practical work is at the heart of this course. Students will develop intellectual curiosity about the design and manufacture of products. They will explore, design, create and evaluate innovative solutions in response to realistic design contexts.

Students will develop knowledge and understanding of the core technical, designing and making principles for product design

### Course Outline

This two year linear course requires students to engage in both practical and theoretical study. This course requires students to cover design and technology skills and knowledge under the two headings: 'Technical principles' & 'Designing and Making principles.'

In year one students will combine advanced theory and practical based learning in the Design workshop. Students will be expected to develop their skills from their GCSE D&T courses and apply them to a variety of making challenges. Regular assessments are set through year one which also includes an assessed design and make project.

### Assessment

Students will sit two papers at the end of their second year and submit a NEA task.

Paper 1: Technical principles 30% of the A Level

Paper 2: Designing and making principles 20% of the A Level

Non-exam assessment (NEA) 50% of the A Level. All students will undertake a substantial design and make task and produce a final prototype. This will be a written or electronic portfolio with photographic evidence of their final outcome. Students will be assessed on their ability to carry out detailed exploration, designing and making, analysis and evaluation.

### Future

A good pass at A level is a good indicator to employers and universities of a student's commitment to their chosen career pathway. This course stands well on its own as a direct route into degree courses and students often take work that they have produced to Apprenticeship and University interviews. This course fits in well with all our KS5 courses and specifically supports our Engineering and Construction based courses.

**When your Key Stage 5 course finishes:**

**SEEKING EMPLOYMENT**

Students will be supported as they consider what type of employment is most suitable for them and they will also be prepared to go out and pursue those opportunities. Higher Level Apprenticeships will be available and involve apprentices working towards work-based learning qualifications such as Level 4+ NVQs and BTECs and Foundation degrees relevant to the sector worked in.

**GOING TO UNIVERSITY**

**UCAS Points**

If you are intending to go to University then the following information regarding UCAS points will be useful for you. Please note that the table does show the revised value of AS level qualifications.

Points	Level 3 Cambridge & C&G Full Diplomas	Level 3 Cambridge & C&G Foundation Diplomas	A level	EPQ	AS level
112	D*D*				
104	D*D				
96	DD				
84		D*D*			
80	DM				
78		D*D			
72		DD			
64	MM				
60		DM			
56			A*		
48	MP	MM	A		
40			B		
36		MP			
32	PP		C		
28				A*	
24		PP	D	A	
20				B	A
16			E	C	B
12				D	C
10					D
8				E	
6					E

For the Diplomas D = Distinction, M = Merit, P = Pass

More information is available on the UCAS website