



## Department Staffing

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## Our Aims

Our department is a successful department which is forward thinking in its delivery of all Key Stages 3, 4 and 5. Our aims are to provide opportunities for students to:

- Enjoy turning ideas into reality.
- To strive for successful outcomes.
- Be creative and develop thinking skills.
- Work independently and develop self-esteem.
- To develop attitudes of curiosity, enquiry, initiative, ingenuity, resourcefulness.
- To experience a range of different material areas.

We have high expectations of all our students and lead by example. We deliver our curriculum with a consistent and co-ordinated approach.

## Department Information

Engineering & Design Technology is taught in 4 specialist rooms. One room is fully equipped and has ICT and printing access, this room has got most of our CAD/CAM equipment which includes access to a laser cutter, 3D printer & CNC Router.

The two practical workshops offer students a wide range of facilities for working in all materials including one room with woodwork specialist machinery and the other room has Engineering specialist machinery.

Most rooms have access to bookable laptops, which have wireless connections to the school network and the internet; this gives more flexibility in teaching CAD.

The school library is a valuable resource housing a good range of books and further access to ICT.

## Key Stage 3 – D&T

At North Oxfordshire Academy we aim to develop a broad range of skills and knowledge through the use of project-based learning. The course is guided by the requirements of the National Curriculum for Technology, where-by students learn and develop a range of skills which include; designing, making, analysing, problem solving and evaluating.

The DT department consists of a range of purpose built specialist rooms which include a CAD/CAM room, two multi material workshops and a graphics room. All of our specialist rooms are well equipped and students have sole access to laptops, 3D Printers, printers, laser cutter, CAM machinery and a wide range of hand tools.

## Key Stage 3 Programme of Study (Timeline)

The students will follow a rotation system for blocks of nine or ten weeks where they will experience the following areas: Design & Technology & Hospitality then within these they will incorporate graphics and electronic elements.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Y7 RM						
Y8 RM						
Y9 Taster						

## **Design & Technology**

The Design & Technology KS3 course introduces students to a variety of materials through an approach based upon the students designing solutions to given situations. To ensure students focus upon certain areas they are given constraints which are built into the "Situations" they explore and the "Design Briefs" they are set. The KS3 Scheme of Work ensures there is progression and continuity throughout the key stage.

## **Home Learning**

All parents are encouraged to support their child by checking "Go4Schools" and staff within the faculty set homework regularly for students using this resource.

At KS3 homework is set once every two weeks for each of the classes we teach.

Students are expected to complete weekly homework in preparation for their controlled assessment tasks for their final grade, which goes through the design process from the research stage through to the making, testing and evaluation sections.

## **Web Links**

These websites are helpful to all students studying Design & Technology at KS3 or KS4 and are useful for parents wishing to further support students in their home learning tasks.

<http://www.bbc.co.uk/schools/gcsebitesize/design/resistantmaterials/>  
<http://www.bbc.co.uk/schools/gcsebitesize/design/graphics/> <http://www.technologystudent.com/>  
<http://www.design-technology.info/resistantmaterials/>

## **Introduction to Engineering Key Stage 4/5**

Are you interested in an exciting career in Engineering? Would you like to go into product design, aerospace, manufacturing, electronics, electrical engineering, or the automotive industry as a project leader or designer? Do you want to go on to university level study or enter employment at technician level? Engineering is the wide-ranging profession of applying scientific principles to the design and construction of various industrial and domestic products to benefit society and the environment.

## **Year 10 - WJEC Engineering Level2 Award**

## **Year 11 - BTEC First Award in Engineering Level 2**

The BTEC Level 2 first award is a two-year practical, theory & work-related course. You learn through the completion of projects and assignments that are based on real-life workplace situations, activities and demands. It introduces you to the employment area you have chosen and provides a good basis to go on to a more advanced work-related qualification such as sixth form Level 3 Engineering, the National Diploma or an Engineering Apprenticeship. A BTEC Level 2 first award is equivalent to one GCSE grades 1-9.

**For Year 11:** You will study three units over two years covering a range of engineering related subjects which give you an understanding of the skills, qualities and knowledge needed to work in this field. Over the two years of the course you will study:

- Unit 1: The Engineered World (Exam)
- Unit 2: Investigating an Engineering product
- Unit 7: Machining techniques

**For Year 10:** Engineering Level 1 / 2 Award (IVQ) is split into units and the assessment is both internally and externally. The Award consists of three mandatory units. Internally assessed work must be completed within a centre and adopt the principles of controlled assessment.

- Unit 1: Engineering Design
- Unit 2: Producing Engineering Products
- Unit 3: Solving Engineering Problems (Exam)

## Is a qualification in Engineering suitable for me?

The award is suitable for anyone interested in manufacturing processes, learning how things work and some practical engineering skills. You may be thinking about a career in one of the many branches of engineering such as mechanical, civil and design or you may be considering a manufacturing or industrial engineering career/ architecture or construction based career.

## How will I learn?

Most lessons will be taught in our new state-of-the art equipped facilities. This has a dedicated CAD/CAM room and two superbly equipped engineering workshops. For much of your time on the course you will be carrying out assignment based projects. You will be expected to spend at least three hours per week on private study to complete these projects.

## How will I be assessed?

Each exam board has exam units and one external exam that will be sat in Year 11. Projects are submitted for marking on a regular basis throughout the course. They are assessed internally by your teachers and then moderated by the board. Work is graded and written feedback provided enabling students to gauge how well they are doing on the course. Feedback will help you to see the strengths of your work, as well as allowing you to reflect on areas which can be developed further. Your work will be graded pass, merit or distinction.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
<b>Y10Eng.</b>	Model Car		Metal Clock		Engineering Design	
<b>Y11Eng.</b>	Investigating an Engineered Product			The Engineered World		

## Home Learning & Independent Study Expectations

All deadlines for Home learning are issued on “Go4Schools”.

All activities and help sheets are kept in the KS4 Engineering folder on the school network. Please use the following specification to help you ensure you are completing all your coursework to the correct assessment and grading criteria. Specification;

### Year 11-

[http://www.edexcel.com/migrationdocuments/BTEC%20Firsts%20from%202012/BF031439\\_SPEC\\_BTEC\\_L\\_1\\_2\\_AWARD\\_IN\\_ENGINEERING\\_ISS\\_2\\_NEW.PDF](http://www.edexcel.com/migrationdocuments/BTEC%20Firsts%20from%202012/BF031439_SPEC_BTEC_L_1_2_AWARD_IN_ENGINEERING_ISS_2_NEW.PDF)

### Year 10-

<http://www.wjec.co.uk/qualifications/engineering/>

## Exam papers

Year 10- Previous Exam papers:

<http://www.wjec.co.uk/qualifications/qualification-resources.html?subject=Engineering&level=Level12AwardNQF>

Year 11- Previous Exam papers:

<https://qualifications.pearson.com/en/qualifications/btec-firsts/engineering-2012-nqf.coursematerials.html#filterQuery=category:Pearson-UK:Category%2FSpecification-and-sample-assessments>

## Design & Technology Key Stage 4

### Why should I choose this subject?

Design & Technology is a practical based subject which encourages you to combine your designing and making skills with knowledge and understanding in order to make quality products. What makes this course enjoyable is that you will learn how to do things through practical experience

## Design & Technology Edexcel GCSE

The aim of the Design & Technology curriculum is to provide each and every student with the opportunity to develop a knowledge and understanding of a broad range of practical skills and techniques both graphically on paper and in relation to actual ‘Design & Technology’ i.e. metal, plastic, wood, electronic components and circuits. Design & Technology is a popular subject and students have the opportunity to be creative and independent. Students can also explore their design creativity in their folder work and express themselves graphically in the form of sketches and drawings.

### How will I learn?

Most lessons will be taught in our new state-of-the art equipped facilities. This has a dedicated CAD/CAM room and two superbly equipped engineering workshops. For much of your time on the

course you will be carrying out assignment based projects. You will be expected to spend at least three hours per week on private study to complete these projects.

## What will I learn?

You will learn about materials, how to join them together, how to mark them out accurately as well as choosing and using tools correctly. You will also be taught how to use Computer Aided Design (CAD) software and how to evaluate existing products. This is an enjoyable subject for those pupils who like to make things and it develops your creative skills.

## How will I be assessed?

The controlled assessment project is worth 60% of the course. It is very important and you will be able to select an item that you would like to make. Once you have decided what you are making, you will need to create a written portfolio of work which will include a situation, a design brief, research, designs, models and comments on you how tested your designs. In your final term you will revise for your written examination which is worth 40% of the total marks allocated.

Title	Weighting	Exam
Component 1: Written paper	50% 100 marks 1hr. exam time To produce 20 A3 pages	<b>Content overview</b> 1 – Core content and any <b>one</b> from the following material categories: 2 – Metals 3 – Papers and boards 4 – Polymers 5 – Systems 6 – Textiles 7 – Timbers
Component 2: Non-examined assessment	50% 100 marks Approx. 45 hours	The marks are awarded for each part as follows. o <b>1 – Investigate</b> (16 marks) o <b>2 – Design</b> (42 marks) o <b>3 – Make</b> (36 marks) o <b>4 – Evaluate</b> (6 marks)

	Term 1				Term 2	Term 3	Term 4	Term 5	Term 6
<b>Y10DT</b>	W	P	M	S	CAD/CAM		Solid works	Design Brief	
<b>Y10 DT</b>	Controlled Assessment						Exam prep.		

## Where will this subject take me?

This subject really helps you if you want a career in engineering, construction, plumbing, design, electrical installations, carpentry, motor mechanics, landscape gardening, farming, etc. Design & Technology is useful as it develops your confidence when working with materials such as wood and metal which can be used in later life when engaged in DIY projects or repairing household objects.

In year 11 students often take their design portfolios and pictures of the products they are making to interviews. Potential employers and college tutors look favourably upon this work as it shows them what you are capable of doing and that you can work independently.

This course also provides excellent preparation for further studies such as A' level product design, and also a wide range of NVQ courses which can lead to degree courses.

## Home Learning & Independent Study Expectations

All deadlines for Home learning are issued on "Show my Homework".

All activities and help sheets are kept in the KS4 Design & Technology on the school network. Please use the following specification to help you ensure you are completing all your coursework to the correct assessment and grading criteria.

Specification:

<https://qualifications.pearson.com/en/qualifications/edexcel-gcses/design-and-technology-2017.html>

## Exam Papers and Mark Schemes:

<https://qualifications.pearson.com/en/qualifications/edexcel-gcses/design-and-technology-2017.coursematerials.html#filterQuery=category:Pearson-UK:Category%2FSpecification-and-sample-assessments>

## BTEC Engineering Key Stage 5

For your new BTEC Nationals courses, we're building on what you've told us you value most:

- The flexible range of course sizes
- Up-to-date, vocational content
- A practical approach to assessment
- Credibility with higher education and employers to support student progression.

## **BTEC Subsidiary Diploma in Engineering (Level 3) Single Engineering BTEC Diploma in Engineering (Level 3) Double Engineering**

A BTEC Subsidiary Diploma is a 2-year vocational course that would normally be studied alongside a range of traditional A level programs or BTEC Subsidiary Diplomas. The full Subsidiary Diploma is equivalent to one A Level, and carries a maximum of 120 UCAS points. The BTEC Certificate, awarded after successful completion of one year, is equivalent to an AS Level and carries a maximum of 60 UCAS points.

You will study six units over two years covering a range of engineering related subjects which give you an understanding of the skills, qualities and knowledge needed to work in this field. Over the two years of the course you will study:

- Health and safety
- Fabrication
- Electrical and electronic principles
- Welding Technology
- Engineering drawing
- Computer Aided Manufacture

### **Is the BTEC Subsidiary Diploma in Engineering suitable for me?**

The Subsidiary award is suitable for anyone interested in manufacturing processes, learning how things work and some practical engineering skills. You may be thinking about a career in one of the many branches of engineering such as mechanical, civil and design or you may be considering a manufacturing or industrial engineering career.

### **How will I learn?**

Most lessons will be taught in our new state-of-the art equipped facilities. This has a dedicated CAD/CAM room and two superbly equipped engineering workshops. For much of your time on the course you will be carrying out assignment based projects. You will be expected to spend at least six hours per week on private study to complete these projects.

### **How will I be assessed?**

The BTEC Subsidiary Diploma is 100% coursework assessed - there are no exams. Projects are submitted for marking on a regular basis throughout the course. They are assessed internally by your teachers and then moderated by the board. Work is graded and written feedback provided enabling students to gauge how well they are doing on the course. Feedback will help you to see the strengths of your work, as well as allowing you to reflect on areas which can be developed further.

Your work will be graded pass, merit or distinction. The BTEC Diploma is worth 240 UCAS points. The BTEC Subsidiary Diploma is equivalent to one A Level and carries a maximum of 120 UCAS points. The BTEC Certificate, awarded after successful completion of one year, is equivalent to an AS Level and carries a maximum of 60 UCAS points.

Students must complete and pass the first year to be awarded a BTEC Certificate and the full 2 years of the course to receive the full BTEC Subsidiary Diploma.

## Home Learning & Independent Study Expectations

All deadlines for Home learning are issued on "Show my Homework".

All activities and help sheets are kept in the KS5 Engineering folder on the school network. Please use the following Unit outlines to help you ensure you are completing all your coursework to the correct assessment and grading criteria.

### **Pearson BTEC Level 3 Subsidiary Diploma in Engineering** **500/7841/0**

Unit	Mandatory units	Credit	Level
1	Health and Safety in the Engineering Workplace	10	3
5	Mechanical Principles and Applications	10	3
Unit	Mandatory units	Credit	Level
16	Engineering Drawing for Technicians	10	3
22	Fabrication Processes and Technology	10	3
23	Welding principles	10	3
31	Computer Aided Manufacturing	10	3

### **Pearson BTEC Level 3 Diploma in Engineering** **500/8154/8**

Unit	Mandatory units	Credit	Level
1	Health and Safety in the Engineering Workplace	10	3
2	Communications for Engineering Technicians	10	3
3	Engineering Project	20	3
4	Mathematics for Engineering Technicians	10	3
5	Mechanical Principles and Applications	10	3
6	Electrical and Electronic Principles	10	3
Unit	Mandatory units	Credit	Level
16	Engineering Drawing for Technicians	10	3
17	Computer Aided Drafting in Engineering	10	3
22	Fabrication Processes and Technology	10	3

23	Welding principles	10	3
31	Computer Aided Manufacturing	10	3

<http://qualifications.pearson.com/en/qualifications/btec-nationals/engineering-2010.coursematerials.html#filterQuery=category:Pearson-UK:Category%2FSpecification>

## What will you need to study this course?

To study Engineering, you will need 5 or more A\*-C grades at GCSE, or equivalent, including at least a Merit in Engineering.

### Specification:

<http://www.edexcel.com/migrationdocuments/BTEC%20Nationals%20from%202010/9781446924112-BTEC-90c-L3-Eng-Iss3.pdf>

### Suggested Websites

<http://www.technologystudent.com/> <http://www.practicalstudent.com/>  
<http://www.mastersindatascience.org/blog/the-ultimate-stem-guide-for-kids-239-coolsites-about-science-technology-engineering-and-math/>  
<http://www.edexcel.com/quals/firsts2012/engineering/Pages/default.aspx>  
<http://www.edexcel.com/quals/nationals10/eng/Pages/default.aspx> <https://grabcad.com/>  
<http://www.bbc.co.uk/schools/gcsebitesize/design/resistantmaterials/>