

A Level Design & Technology @SJB

A Level D&T is about identifying and solving 'user centred' problems. Design ideas are sketched, modelled, tested and analysed using state of the art technology including laser cutting, 3D printing, programming and modern assembly techniques. CAD plays an important part in modelling, testing and analysing ideas, in order for them to improve and evolve through an 'iterative' approach.

The AS and A Level courses offered follow the WJEC specification. Have a look at the course content here:

https://www.wjec.co.uk/qualifications/design-and-technology-as-a-level/#tab_overview

click on the PDF Book image or just download.

We will be able to deliver **AS and A Level Product Design** and **AS and A Level Engineering Design**, so if you have a preference, we will be able to cater for your favourite pathway. Some students wishing to secure Engineering based apprenticeships might prefer the **AS /A2 Engineering Design** course. However, if your ambition is to study Product Design at University, the natural route to being an undergraduate is via **AS / A2 Product Design**.

Unit 1 AS Examination / Unit 3 A2 Examination.

You will find more information about exams following the link below, where there are some past papers for both **Product Design** and **Engineering Design**, together with Marking Schemes.

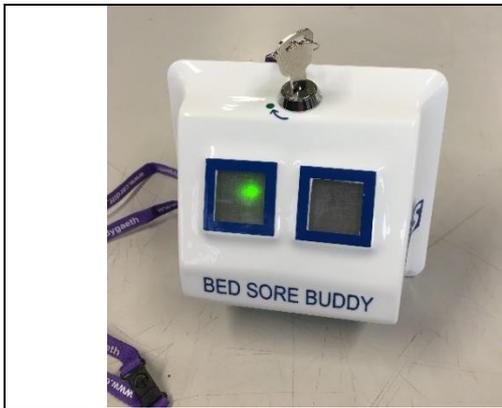
Unit 2 AS NEA / Unit 4 A2 NEA

The NEA is the Non Examined Assessment element of the course. This is the 'coursework' project that some people find the most exciting or enjoyable part of D&T.

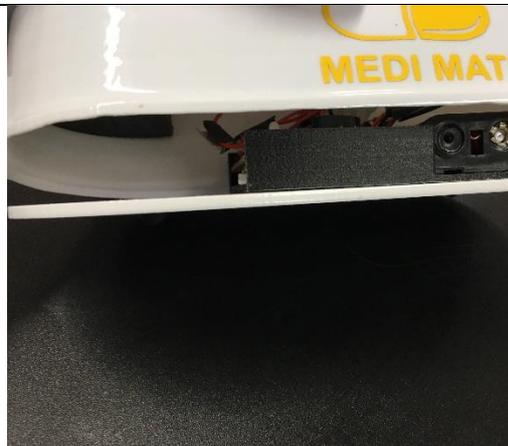
The projects below are some recent concepts produced at SJB.

Niamh Kathrens produced the 'Bed Sore Buddy' for her AS Engineering Design project at AS in 2020. This innovative device features a complex pcb that uses a PIC (programmable Interface controller) to tell NHS nurses when patients in hospital ward beds need to be turned / moved to avoid bed sores. The device illuminates red or green LEDs, bleeps and alerts the smart phone App to ensure the nurse returns to move the patient. The nurse has a special key which resets the time delay on the device! Clever!





Megan Davies identified a design problem with a family member who was diabetic and needed to take medication at 3 different intervals during the day. Often, her relative would forget, and this could cause serious health issues. Megan designed a pill dispenser that illuminates and sounds a buzzer to remind the user to take medication. It also records how many pills have been taken so the user can look at the dispenser and see if they've taken their medication during the day. Medi-mate uses a PICAXE 08M2 chip to control the device. It's made from a vacuum formed shell with 3D printed internal structures to hold pills, the battery pack, pcb and control components.



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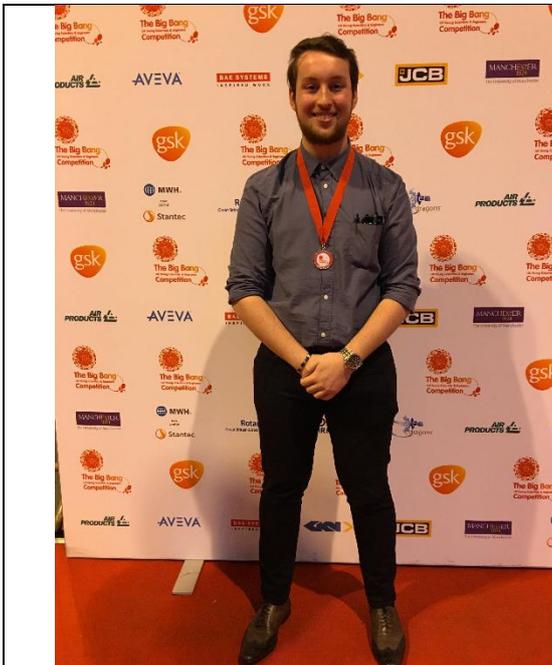


STEM @SJB and Design Competitions

We are very fortunate to have the backing of the South Wales Institute of Engineers who recognise the STEM (Science Technology Engineering and Maths) content of some of the projects that students complete.

Every year, there are two cash prizes of £75 and a SWIE Certificate for the winners!

Matthew Morris, pictured below at Birmingham NEC 'Big Bang' Engineering competition, is a past winner of the SWIE prize and also a competitor at the annual WJEC Innovation Awards competition. This is an event run by WJEC to celebrate the creative and innovative concepts produced by GCSE, AS and A Level students from schools in Wales. SJB regularly has entrants who reach the final exhibition stages of this competition – and we have even had a first prize winner!



In 2016, Joe Ringrose won the GCSE category with his Electronic Washing Line Rain Sensor. A well developed idea to alert the user once it starts raining to take the washing off the clothes line! Joe's work was exhibited at Sophia Gardens, Cardiff, Bangor University in North Wales, and Joe was invited to attend a winners ceremony at The Senedd, Cardiff Bay, presented by Kirst Williams Cabinet secretary for Education.



1st Prize, £250 Prize, £250 for SJB, Trophy and Certificate

Many students have achieved excellence during their pathway through D&T at SJB. Daniel Edmunds was awarded a Registered Design to secure his Intellectual Property as part of his A Level D&T project work. Kieron Morris was granted a Patent by the IP Office to protect his modular wine rack. The certificates on display around the department illustrate the creativity and innovation that occurs when STEM skills are used during problem solving.

D&T, STEM and the future

Studying D&T and STEM based subjects provides the opportunity to analyse and evaluate how emerging and new technologies are leading the way in product development. The jobs available in ten years time probably do not exist yet! Just consider the removal of petrol and diesel car production from UK by 2030, and imagine the opportunities that will soon be available for e-cars, battery technology, and green energy supplies for vehicles.

The recent review of Engineering, Advanced Manufacturing and Energy Sector has revealed many gaps, and more importantly, many future opportunities for learners aspiring into this under-populated area. The gender balance is also a concern, and more and more females are being encouraged into Engineering disciplines.

See the links below for more information.

<https://gov.wales/sites/default/files/publications/2018-02/science-technology-engineering-and-mathematics-stem-guidance-for-schools-and-colleges-in-wales.pdf>

<https://qualificationswales.org/english/news/qualifications-wales-highlights-the-importance-of-engineering-in-new-report/>

<https://qualificationswales.org/english/qualifications/vocational-qualifications/sector-reviews/engineering-advanced-manufacturing-and-energy-sector-review---oct-2020/>

D&T – Pathway into Higher Education

In Wales, we have award winning courses for **Design and Engineering at Bangor University**.

<https://www.bangor.ac.uk/courses/undergraduate/w240-product-design-english-medium-course>

<https://www.bangor.ac.uk/study/undergraduate/product-design>

University of Swansea – Furniture Design degree

<https://www.uwtsd.ac.uk/ba-product-design/>

https://www.swansea.ac.uk/engineering/electrical/?utm_campaign=engineering20&utm_medium=ad&utm_source=google&utm_term=uk&utm_content=electrical&gclid=EAlaIQobChMI3MLdpbq07QIViu_tCh2UxgNIEAAYASAAEgJR3fD_BwE

Cardiff Met – School of Art & Design

<https://www.cardiffmet.ac.uk/artanddesign/Pages/default.aspx>

<https://www.cardiffmet.ac.uk/artanddesign/courses/Pages/babscproductdesign.aspx>

Further afield:

<https://www.lboro.ac.uk/departments/design-school/>

<https://www.brunel.ac.uk/brunel-design-school>

https://www.uwe.ac.uk/courses/find-a-course/courses-by-subject/engineering?gclid=EAlaIQobChMI3MLdpbq07QIViu_tCh2UxgNIEAAYAiAAEgL0cvD_BwE&gclidsrc=aw.ds