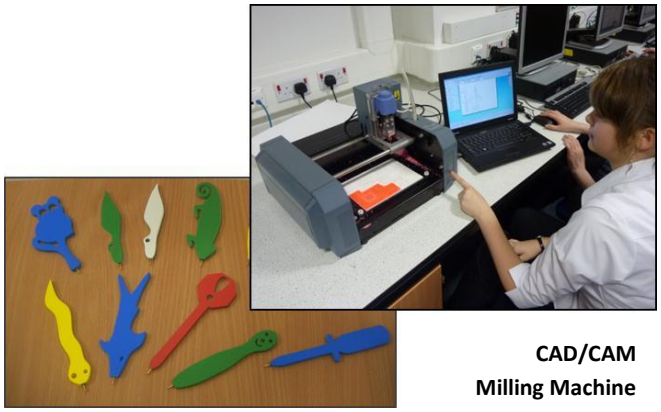
National 4/5 - Design & Manufacture

- ***Course Aims***

This course will help develop you into a creative, flexible learner, and build up an ability to apply skills and knowledge in a variety of real life situations. It aims to help pupils produce effective solutions for a variety of design tasks. They will learn how to convey their ideas through design folios and through the construction of prototype models in a variety of materials (metals, woods and plastics).



CAD/CAM Milling Machine

- ***Course Description***

If you enjoy sketching, are imaginative, have an interest in design and like practical workshop activities then this is the course for you. Pupils will have the opportunity to explore the impact of design and technology in everyday life. They will consider the complete life of a product from its initial conception, through design development, the materials and methods of manufacture, the marketing, to its impact on society. Folio work will develop research, drawing, sketching and rendering skills. Pupils will be involved in the manufacture of products using a milling machine linked to a computer and using practical craft / machine skills.

Assessment:

- *Internal assessments*:- An assignment set by the SQA and worth 90 marks will be undertaken during the course.
- *External assessments*:- This will consist of a single final examination worth 60 marks covering design, tools and processes.

Homework:

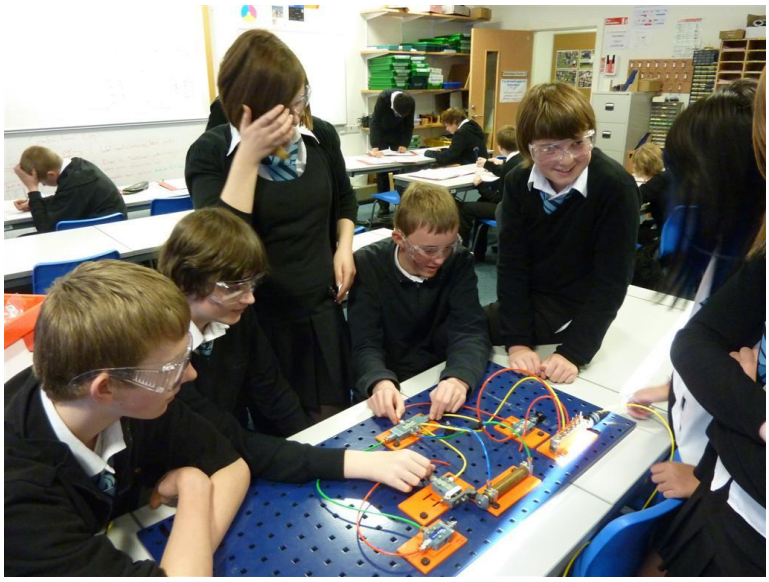
- This will be given throughout the course, usually research, investigation or revision work which is relevant to the projects being undertaken.

Progression:

- This course can lead to Higher and Advanced Higher grade.
- *Possible career routes:–* Graphic Design, Architecture, Product Design, and Engineering.

National 4/5 **Engineering Science**

- **Course Aims**
  This course encourages learners to become successful, responsible and creative in their use of technology to solve real life problems. Pupils will develop the four Curriculum for Excellence capacities as well as skills for life and work. Society requires, and demands more engineers. Young people will develop an informed view of engineering and undertaking this course will focus on the development of transferable skills. The course will be of particular interest to learners considering a career in engineering or one of its many branches such as climate change, medical development, Information technology and transport.



PNEUMATICS IN ACTION

- **Course Description**
  Engineering is vital to everyday life; it shapes the world in which we live and its future. This course will allow young people to apply knowledge and understanding to key engineering facts and ideas, developing skills in analysis, design, construction, problem solving and evaluation in a range of engineering problems. There are three main areas of study;
    - Engineering Contexts and Challenges – This area of the course develop engineering concepts by exploring a range of engineering objects, engineering problems and solutions. Learners will explore existing and emerging technologies and challenges, and consider implications to the environment, sustainable development, and economic and social issues.
    - Electronics and Control – Learners will explore a range of concepts and devices used in electronic control systems, including analogue, digital and programmable systems. Skills in problem solving and evaluating are developed through simulation, practical projects and investigation tasks in a range of concepts.
    - Mechanisms and Structures – This unit develops an understanding of areas such as motion, drive systems, pneumatics, forces and equilibrium.
    - ***Assessment:***
- *Internal assessments* – An assignment worth 60 marks, set by the SQA, will be

conducted in class under supervision.

- *External assessments* – A single examination worth 90 marks.

Homework:

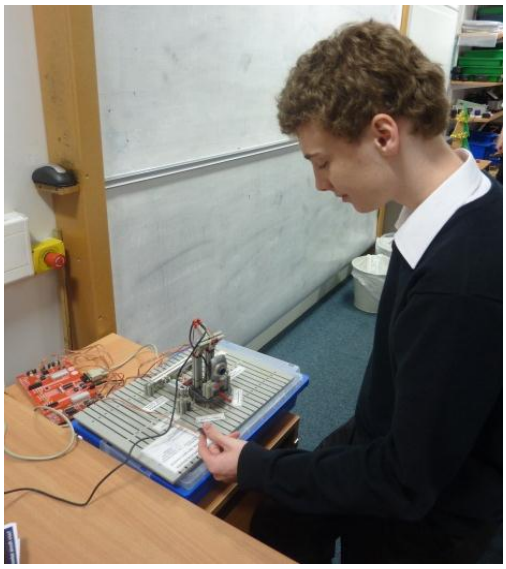
- Formal homework will be given throughout this course and additional work given in response to individual needs.

Progression:

- This course leads to Higher and Advanced Higher

MICROCONTROLLER PROGRAMMING

- *Possible career routes:-* Oil and Gas, renewables, medical development, construction, as well as further and higher education courses in engineering, design & manufacture. Courses in Engineering Science and in Physics are designed to be complimentary; a combination of this course and a pure science course will provide a very strong foundation for further study in engineering or the sciences.



National 4/5 **Graphic Communication**

- ***Course Aims***
  This course provides opportunity for learners to gain skills in reading, interpreting, and creating graphic communications. They will initiate, develop and communicate ideas graphically, showing spatial awareness and visual literacy through graphic experiences. The course activities also provide opportunities to build self-confidence and enhance transferable skills in literacy, numeracy, researching, ICT, and planning work tasks.

- ***Course Description***
  The Graphic Communication course introduces learners to the diverse and ever-increasing variety of presentation methods employed in the design and Graphics fields. Pupils will develop skills in2D and 3D graphics, and will produce graphics with visual impact and transmit information effectively. The course consists of two mandatory units;

  2D Graphic Communication – learners will develop their creativity and skills in order that they produce drawings that communicate their ideas using computer software and more traditional drawing techniques.

  3D and Pictorial Graphics – candidates will develop knowledge of colour, illustration and presentation techniques to present information in a meaningful, exciting and professional pictorial format. Production drawings will be created and these will communicate information about materials and dimensions. Presentation drawings that convey graphic design creativity and visual impact are an influential element of this course.

Assessment:

- *Internal assessments* – An assignment worth 50 marks will be completed during the course.
- *External assessments* – A single examination paper worth 50 marks

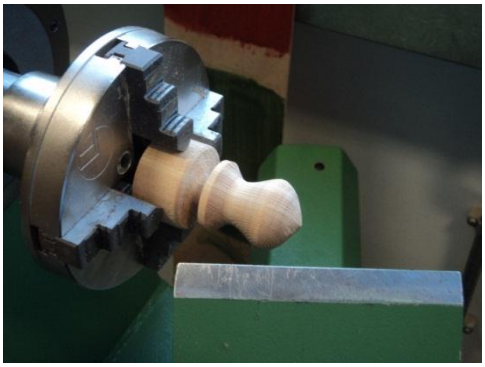
Homework:

- Formal homework will be given throughout this course and additional work given in response to individual needs. Folio deadlines must be met and pupils are encouraged to meet these through additional home study as required.

Progression:

- This course can lead to Higher and Advanced Higher
- *Possible career routes:-* Engineering, building & construction, graphic design. Further and higher education courses in engineering, design & manufacture.

National 4/5 **Practical Woodworking Skills**



- ***Course Aims***
  The course provides opportunities for learners to gain a range of practical woodworking skills and use a variety of tools, equipment and materials. It allows them to plan activities through the completion of a finished product in wood. Participants will develop and enhance psychomotor skills, practical creativity, practical problem solving skills, an appreciation of safe working practices in a workshop environment, and an understanding of sustainability issues in a practical woodworking context.

- ***Course Description***
  The structure of this course allows learners to cover fundamental woodwork skills in a progressive fashion. An appreciation of safe working practices will be an integral part of the learning experience.

The course comprises of three mandatory units;

- Flat-frame Construction – Learners will develop skills in the use of woodworking tools and in making woodworking joints and assemblies commonly used in flat-frame joinery. Pupils will also learn to read and use drawings and diagrams depicting woodwork tasks.
- Carcase Construction –
  Tasks in this unit will include the use of manufactured board or frames and panels in the construction of a carcase such as the body of a clock or cabinet.
- Machining and Finishing –

Learners will develop skills in using common power tools such as drills, sanders and woodwork lathes. Development of skills in a variety of woodworking surface preparation and finishing techniques will also be undertaken.

Assessment:

- *Internal assessments* – A practical project is constructed during the course and marked out of 100.
- *External assessments* - There is no external examination for this course.

Homework:

- Some formal homework will be given throughout this course and additional work given in response to individual needs.

Progression:

- Possible career routes:- The building trade, cabinet making, joinery and other practical technology areas.