Industrial Arts

The primary role of Industrial Arts education is to expose students to a variety of industrial and engineering technologies that improve their understanding of the industrial and engineered world. Moreover, students learn both project management and design principles; most courses are project-based with students realizing a solution to a design or engineering challenge.

Industrial Arts has a single compulsory course for Years 7 and 8: Technology (Mandatory). For Years 9 and 10, all Industrial Arts courses are electives, the three electives on offer are Design and Technology, Graphics Technology, and Industrial Technology.

- **Design and Technology**: this course centres on design without a prescribed context, so students may work with a variety of non-specified technologies. Students are given a design challenge and they come up with a solution. Their passage through the design process is documented in a Design Folio.

- **Graphics Technology**: this course introduces students to both manual (pencil) technical drawing and Computer Aided Design (CAD). This course has a core study in Year 9 and then a variety of electives for Year 10.

- **Industrial Technology**: this course may be studied with a variety of different disciplines with the most popular ones being: timber, metal, electronics, multimedia, and engineering. All have a common theme that students are involved in designing and making projects relevant to the context being studied. The development of their project is documented in their Project Report. A key part of the project report is evaluation of the finished product.

In Years 11 and 12, Industrial Arts offers three Higher School Certificate (HSC) non-Vocational courses: Design and Technology, Engineering Studies, and Industrial Technology.

- **Design and Technology** is an extension of the junior course of the same name. The course centres on design without a prescribed context, so students may work with a variety of non-specified technologies. For their HSC, students must create a Major Design Project. Students establish a need and then try to solve it and realise a solution. A key part of the project is evaluation through the design process. The Major Design project counts for 60% of their final HSC examination mark.

- **Engineering Studies** is primarily a theory course that introduces students to the engineered world. The course looks at a variety of engineering applications and fields of engineering. Students learn about engineering history and societal implications, engineering mechanics, engineering materials, engineering electronics, and engineering communication methods. The course introduces students to many concepts that they would otherwise first encounter in undergraduate engineering programmes at university. One of the fundamental aspects of the course is learning engineering through the investigation of real-life applications. This builds greater significance and understanding in students.

- **Industrial Technology** is also an extension of the junior course of the same name. The course centres on students working within a prescribed technology such as: Timber Products and Furniture Industries, Multimedia Industries, Graphics Industries, and Metal and Engineering Industries. For their HSC, students must create a Major Project. Students develop a project and document their progress through the project. Hence, they learn the vital skills of project management. Similar to Design and Technology evaluation of the project is an
important part of the associated documentation. The Major Project counts for 60% of their final HSC examination mark. The fundamental difference between Industrial Technology and Design and Technology is that a student studying Industrial Technology must study theory relevant to specific technology and also study industry practices relevant to their technology.

**Industrial Arts Department**

HEAD TEACHER - Mr David Youman

Our goal in the Industrial Arts Department at South Grafton High School is to encourage students to become confident, safe and efficient users of technology which will enrich and assist students in their studies, work and life.

We aim to provide opportunities to:
- Be creative and innovative
- Solve problems
- Learn new skills

All students at South Grafton High School undertake a compulsory course in Technology Mandatory in their first two years at the school. This course is structured to not only meet the requirements of the Board of Studies, but to also give students grounding for subjects that they may elect to do in Years 9 and 10 (Stage 5).

With this in mind, students will have experience in working with a variety of materials including timber, metal, plastics as well as developing their skills in graphics and computer technologies.

The list below sets out the range of subjects offered by the Industrial Arts faculty

**Years 7 & 8 (Stage 4) Technology (Mandatory)**

**Years 9 & 10 (Stage 5)**
- Graphics Technology
- Industrial Technology - Metal
- Industrial Technology – Timber
- Industrial Technology - Engineering
- Industrial Technology - Multimedia is taught by the Computing Studies Faculty

**Years 11 & 12 (Stage 6)**
- Engineering Studies
- Industrial Technology - Timber Products and Furniture Technologies
- Industrial Technology - Multimedia is taught by the Computing Studies Faculty
- Construction (VET)
- Metal & Engineering (VET)

**Industrial Arts: Year 7 and 8**

All students at South Grafton High School undertake a compulsory course in Technology Mandatory in their first two years at the school. This course is structured to not only meet the requirements of the Board of Studies, but to give students grounding for subjects that they may elect to do in Years 9 and 10 (Stage 5).
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**Industrial Arts: Year 9 and 10**

**Industrial Technology - Engineering**  
This is a new subject which provides an excellent link to the Engineering Studies and Physics courses in Years 11 and 12. It provides opportunities for students to develop knowledge, understanding and skills in relation to engineering and its associated industries. The course will have a significant practical focus with much of the course being covered through the construction of projects in metal, timber, plastics, composites and electronics.

**Industrial Technology - Timber** is one of our most popular Industrial Arts electives in the junior school. It involves the designing and making of projects from timber and associated materials. Students will learn how to correctly use a wide range of hand and power tools such as routers, biscuiters, jigsaws and lathes in our well-equipped workshops. Theory work will cover topics such as the design of timber articles, the properties and uses of timber, timber production technology and WH&S issues associated with the timber industry.

**Industrial Technology - Metal**

This is a popular Industrial Arts elective in the junior school. It involves the designing and making of projects from metals and associated materials. Students will learn how to correctly use a wide range of hand and power tools such as files, hacksaw, power drill, angle grinder, jigsaws, drill press, magnabend and lathes in our well-equipped workshops. Theory work will cover topics such as the design of metal articles, the properties and uses of metals, metal manufacturing technology and WH&S issues associated with the metal industry.

**Industrial Technology - Multimedia** *(see Computing Studies faculty)*

**Graphics Technology**  
During this course students will learn how to read and present graphical information to technical people (such as builders, engineers and trades people), develop skills in sketching to help them develop their design ideas as well as learning modern presentation techniques such as the rendering techniques used by graphic artists for advertising.

All students will receive hands on experience in Computer Aided Drawing during the courses. The student’s own design work will feature in areas such as architecture, graphic design, and product design. Students will be required to purchase a basic set of drawing equipment for this course.
Engineering Studies

Engineering Studies is a 2 unit, two year course for Years 11 & 12. University statistics have shown that students who have studied this subject tend to have a greater understanding and success in Engineering, Architecture, Applied Science and other Technology and Design related courses at University and TAFE.

The Engineering Studies course is directed towards the development and application of mathematical, scientific and technological skills and their integration with business and management. It provides students with skills, knowledge and understanding associated with a study of engineering, its practices and associated methodologies. The course aims to make practical sense of these principles as they apply to the design and manufacture of everyday items. The Engineering Studies course is unique in that it develops knowledge and understanding of the profession of engineering.

Students will critically analyse objects to answer questions such as:
- How is it used and how has this affected its shape?
- How is it made, what is it made from and why?
- How could the object be improved?
- How can I draw it so someone else can make it?

The Engineering Studies program for both the Preliminary course and the Higher School Certificate covers eight modules in total. These modules are:
- Engineering fundamentals
- Engineered products
- Braking systems
- Biomedical engineering
- Civil structures
- Personal and public transport
- Aeronautical engineering
- Telecommunications engineering

Industrial Technology – Timber Products & Furniture

Industrial Technology is a practical, non-vocational 2 Unit course for Years 11 & 12. Industrial Technology- Timber Products & Furniture Technologies focuses on specific skills and knowledge associated with the timber industry such as:
- Construction skills to allow you to manage and build a major project primarily from timber. This major project will be worth 60% of the final HSC assessment in this subject.
- current manufacturing techniques and technologies as used in the timber industry
- design limitations in work with wood
- environmental issues associated with the timber industry
- Common management structures of companies within the timber industry
The Preliminary Course The preliminary course uses Project Work as a means of attaining the required construction skills and associated theoretical knowledge. Students will also study the timber industry in general, covering the Structural, Technological and Environmental issues that affect that industry.

The HSC Course will focus on the student’s own major work. The major work will be marked by external examiners and will form part of both the school’s assessment and the HSC assessment. A folio will accompany the major work and will show evidence of planning and management of the major work.

*Industrial Technology – Multimedia (see TAS Computing faculty)*
**Vocational Education and Training (VET)**

**Construction**  
This course is for students who wish to work in the construction industry.  
The purpose of this course is to provide students with the opportunity to gain a range of skills and knowledge suitable for employment in the general construction industry. This course comprises 6 compulsory units of competency and an elective pool containing 11 units of competency.

**Main Topics**  
The compulsory units of competency represent the basic skills, knowledge and attitudes required by all workers within the construction industry. These compulsory units of competency focus on developing the skills required to work effectively within the industry. The compulsory units of competency specifically address work, health and safety procedures, industry awareness, communicating with others, measuring and calculating, handling construction tools and materials, reading and interpreting plans and basic levelling procedures. The electives available in the course complement these competencies by providing a range of practical and technical skills.

**Metal and Engineering**  
This course is for students who wish to work in the metal and engineering industry. The purpose of this course is to provide students with the opportunity to gain a range of skills and knowledge suitable for employment in the industry. This course comprises compulsory units of competency and an elective pool of competency.

**Main Topics**  
The compulsory units of competency represent the basic skills, knowledge and attitudes required by all workers within the metal & engineering industry. These compulsory units of competency focus on developing the skills required to work effectively within the industry. The compulsory units of competency specifically address work, health and safety procedures, industry awareness, communicating with others, measuring and calculating, handling and using handheld power tools, reading and interpreting plans and basic welding procedures. The electives available in the course complement these competencies by providing a range of practical and technical skills.

**Competency-based Assessment.**  
This is a competency-based course. This means that students work to develop the competencies, skills and knowledge described in each unit of competency. To be assessed as competent a
student must demonstrate to a qualified assessor that they can effectively carry out the various
tasks and combinations of tasks listed to the standard required in a construction environment.
There is no mark awarded in competency-based assessment. Students are assessed as either ‘competent’ or ‘not yet competent’.

Both VET courses offered are of a practical nature, the courses explore the
Industries and consists of 70 hours mandatory work placement over the
Preliminary (Year 11) and HSC course. The construction courses are
delivered by the Industrial Arts Faculty in the brand new Industrial standard
workshop (Trade Skills Centre) opened in 2016. Students have the choice
to sit the HSC exam at the end of the course if they wish the subject to
count towards their University entry.