



Government of **Western Australia**
School Curriculum and Standards Authority



MATERIALS DESIGN AND TECHNOLOGY

PRELIMINARY COURSE

Year 11 and Year 12 syllabus

IMPORTANT INFORMATION

Users of this syllabus are responsible for checking its currency.

Syllabuses are formally reviewed by the School Curriculum and Standards Authority on a cyclical basis, typically every five years.

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Introduction to the Preliminary courses

Preliminary courses provide a relevant option for students who cannot access the ATAR or General course content with adjustment and/or disability provisions, or who are unable to progress directly to training from school, or who require modified and /or independent education plans. Preliminary courses are designed for students who have been identified as having a recognised disability under the *Disability Discrimination Act 1992*, and who meet the above criteria.

The Preliminary courses are:

- Business Management and Enterprise
- English
- Food Science and Technology
- Health and Physical Education
- Materials Design and Technology
- Mathematics
- Religion and Life
- Visual Arts

Preliminary courses provide opportunities for practical and well-supported learning to help students develop a range of skills to assist them upon leaving school. They acknowledge the broad range of abilities of students with special needs and the need for adapted approaches to teaching and learning.

Preliminary courses may form all or part of a student's program of study. Schools will make decisions about the content to be taught in each course on the basis of individual student needs, goals and priorities.

Rationale for the Materials Design and Technology Preliminary course

The Materials Design and Technology Preliminary course is a practical course. It allows teachers the choice to explore and use three materials learning contexts: metal, textiles and wood, with the design and manufacture of products as the major focus. There is also the flexibility to incorporate additional materials from outside the designated contexts. This will enhance and complement the knowledge and skills developed within the course, as many modern-day products are manufactured using a range of different material types.

Students may use a few or many materials in their designs and may explore the interactions between materials, people and their environment. Students develop their creativity and understanding of the society in which they live.

Working with materials, students develop a range of manipulation, processing, manufacturing and organisational skills. When designing with materials, they may have opportunities to solve problems, generate innovative ideas and communicate what they do. This enables them to make more informed decisions about the use and misuse of technology.

Aims

The Materials Design and Technology Preliminary course aims to develop students’:

- application of a technology process to create or modify products, processes, systems, services or environments in order to meet human needs and realise opportunities
 - identify issues, values, needs and opportunities
 - devise and generate ideas and prepare production proposals
 - produce solutions and use production processes
 - evaluate intentions, plans and actions
- understanding of how the nature of materials influences design, development and use
 - understand the properties of materials
 - identify the relationship between the appearance and properties of materials
 - select materials based on their appearance and properties, and understand how these characteristics influence design, development and usage
- create material products safely and efficiently to specified standards
 - plan and manage resources to create products within constraints
 - select and apply appropriate techniques and procedures when creating and modifying technologies
 - manipulate equipment and resources safely to meet defined standards
- understanding of the interrelationships between people, the environment and the use of materials
 - identify how values and beliefs influence materials selection, design and technology
 - identify the impact and consequences on society and the environment when selecting and using materials, designs and technologies
 - understand safe and sustainable practices when using materials and technologies

Organisation

Structure of the syllabus

This Year 11 and Year 12 syllabus is divided into four units.

Course contexts

Three materials contexts have been defined in this course: Metal, Textiles and Wood.

Students can enrol in more than one context in this course. The course units in each context have different codes.

Unit 1

This unit focuses on an introduction to design and production. It is a preparatory unit for students with limited experience in manufacturing products. Students make products using prepared and partially completed components, using a small range of tools and machinery, with opportunities for some student-directed design modifications.

Students are introduced to the concept of design and learn that design precedes manufacture. They are assisted to communicate and reflect on their design idea/s and identify similar products.

Throughout the process, using visual and other prompts, students identify and name materials, tools and safety equipment and describe their uses. Students develop an understanding of the links between equipment, safety and behaviours. They work in a guided, simple workshop/studio environment, and with supervision, learn to use one or more relevant technologies that relate to everyday activities.

Unit 2

This unit focuses on production fundamentals. At this stage, students typically have limited tactile experience of products and limited manufacturing experience. They make products, following a planned process, and may require assistance at each stage of the process to complete production. Using visual and other prompts, students follow instructions and provide a simple description of a product, as well as the tools required to produce it.

Students are introduced to the concept of design, and factors affecting design, through a simple design process and with assistance make simple design choices to manufacture the same or a similar product. They understand that a design concept is an idea of what a product may eventually look like, and that it is created through a design process.

Throughout the production process, students learn that products are made from certain materials and that materials can be named and described. With prompts and assistance they hold and use simple tools correctly and safely to assemble a product.

Unit 3

This unit focuses on production experiences. Students are introduced to principles and practices of design, and the fundamentals of design required to manufacture products for themselves. They communicate various aspects of the design process within the structure of 'design, make and appraise'.

Throughout the process, students learn about materials, including their aesthetic properties and suitability for purpose. Students use the technology process and are introduced to relevant technology process skills.

Students work in a defined, guided environment and learn to use a variety of production technologies safely and effectively.

Unit 4

This unit focuses on design in practice. Students apply the fundamentals of design and concepts related to designing for particular needs or purpose. They communicate various aspects of the technology process within the context of making what they design.

Throughout the unit, students learn about the different materials and the suitability of selected materials for a particular purpose. They are introduced to a range of production techniques and equipment, and develop skills, follow plans and realise their design ideas through the production of their design project.

Each unit includes:

- a unit description – a short description of the focus of the unit
- unit outcomes – a set of statements describing the learning expected as a result of studying the unit
- suggested learning activities – a list of activities which could be included in a teaching and learning program to focus on the unit content
- unit content – the common and context specific content to be taught and learned.

Organisation of content

This course consists of a combined Year 11 and Year 12 syllabus. The syllabus is divided into four units. Each unit is designed to be delivered over a semester; however, the pace of delivery will reflect the abilities of the students.

The course content is organised into common content and context specific content. Students study all of the common content and at least one of the contexts.

The content areas cover:

Materials

- Nature and properties of materials
- Materials in context

Design

- Design fundamentals and skills
 - investigate (discuss)
 - devise
 - evaluate

Use of technology

- Skills and techniques
 - information communication technology (ICT)
 - drawing
 - materials selection
- Safety
- Production management
 - product manufacture
 - ongoing evaluation (discussion)

Common content

The metal, textiles and wood learning contexts in the Materials Design and Technology Preliminary course have common content in:

- Design fundamentals and skills
- Skills and techniques
 - ICT
 - drawing
- Safety
- Production management.

Students may use any material as a means through which they approach the course content, or teachers may choose to restrict the choice. They explore ways to use the nature and properties of the material/s towards the completion of a product.

In design fundamentals and skills, students learn about the design fundamentals and basic factors that affect design ideas, while developing a common understanding of the design process and various skills that can be used to express ideas which may apply to design tasks during the design cycle.

As student safety is a high priority in all activities, a common understanding of safe working practices, and an awareness of personal protective equipment (PPE), is achieved in each unit through coverage of common content under the safety heading.

In all three contexts, students make choices during the design process and plan to carry out the making of the product safely. Students are encouraged to integrate additional and complementary material/s from other contexts as a means through which they approach the course content to develop a product. They may explore ways to use the nature and properties of the material/s towards the completion of a product.

Students are expected to follow a guided plan, and with appropriate levels of supervision/support, perform the steps of a production process. They should attempt to discuss a simple ongoing evaluation of any changes made to the production process or the project design.

Representation of the general capabilities

The general capabilities encompass the knowledge, skills, behaviours and dispositions that will assist students to live and work successfully in the twenty-first century. Teachers may find opportunities to incorporate the capabilities into the teaching and learning program for the Materials Design and Technology Preliminary course. The general capabilities are not assessed unless they are identified within the specified unit content.

Literacy

Literacy involves students listening to, reading, viewing, speaking, writing and creating texts, and using and modifying language for different purposes in a range of contexts. It encompasses knowledge and skills students need to access information, make meaning, interact with others, and participate in activities within and beyond school.

Literacy is of fundamental importance in the study of the Materials Design and Technology Preliminary course. Students will access design principles and processes, materials and technological content through a variety of print, oral, visual, spatial and electronic forms, including data books, texts, computer software, images, and written technical materials.

Numeracy

Numeracy is fundamental in calculating materials quantities and evaluating design and technology process costs. Students develop their understanding and skills of numeracy while undertaking tasks to produce, test and evaluate products. Common and context-specific theory continues to be studied to forge greater understanding of the scientific, mathematical and technical concepts that explain how designed products function.

Information and communication technology capability

Information and communication technology (ICT) capability is important in all stages of the design process. Students use digital tools and strategies to locate, access, process and use information. They use ICT skills and understandings to investigate and devise design ideas. Students access information from websites and software programs to develop design solutions. Students use computer aided drawing software and computer control software to make products.

Critical and creative thinking

Critical and creative thinking is integral to the design process. The design thinking methodologies are fundamental to the Materials Design and Technology Preliminary course. Students develop understandings and skills in critical and creative thinking during periods of evaluation at numerous stages of the design process. They devise plausible solutions to problems, and then, through interrogation, critically assess the performance of the most efficient solution. Students identify possible weaknesses in their design solutions, then evaluate and modify the developing solution to construct a functioning prototype.

Personal and social capability

Personal and social capability skills are developed and practised in the Materials Design and Technology Preliminary course by students enhancing their communication skills and participating in teamwork. Students have opportunities to work collaboratively during stages of investigation and making of products. Students develop increasing social awareness through the study of the impact of the use of materials and manufacturing technology on society and on the environment.

Ethical understanding

Students have opportunities to explore and understand the diverse perspectives and circumstances that shape design processes and technology, and the actions and possible motivations of people in the past compared with those of today. Students have opportunities, both independently and collaboratively, to explore the values, beliefs and principles that have influenced past designs and technological achievements, and the ethical decisions required by global design processes of today.

Intercultural understanding

Students have opportunities to explore the different beliefs and values of a range of cultural groups and develop an appreciation of cultural diversity. Students have opportunities to develop an understanding of different contemporary perspectives with regard to design inspiration, product styles, building materials, energy supply and use, and design and technological influences on different groups within society, and how they contribute to individual and group actions in the contemporary world.

Representation of cross-curriculum priorities

The cross-curriculum priorities address contemporary issues which students face in a globalised world. Teachers may find opportunities to incorporate the priorities into the teaching and learning program for the Materials Design and Technology Preliminary course. The cross-curriculum priorities are not assessed unless they are identified within the specified unit content.

Aboriginal and Torres Strait Islander histories and cultures

Students may have opportunities to explore the development and use of technology by Aboriginal and Torres Strait Islander peoples, and the interconnectedness between technologies and identity, people, culture and Country/Place. Students may explore ways in which materials have been used over time, and the methods used to manipulate materials.

Asia and Australia's engagement with Asia

This priority reflects Australia's extensive engagement with Asia in social, cultural, political, and economic spheres. Students may develop an understanding of Asian societies, cultures, beliefs and environments, and the connections between the peoples of Asia, Australia, and the rest of the world. Students may have opportunities to explore traditional, contemporary and emerging technological achievements in the countries of the Asia region. Students could explore Australia's rich and ongoing engagement with the peoples and countries of Asia to create appropriate products and services to meet personal, community, national, regional and global needs.

Sustainability

Students may take action to create more sustainable patterns of living. Students develop knowledge, understanding and skills necessary to design for effective sustainability. Students may focus on the knowledge, understanding and skills necessary to choose technologies and systems with regard to costs and benefits. They evaluate the extent to which the process and designed solutions embrace sustainability. Students reflect on past and current practices, and assess new and emerging technologies from a sustainability perspective.

Unit 1

Unit description

This unit focuses on an introduction to design and production. It is a preparatory unit for students with limited experience in manufacturing products. Students make products using prepared and partially completed components, using a small range of tools and machinery, with opportunities for some student-directed design modifications.

Students are introduced to the concept of design and learn that design precedes manufacture. They are assisted to communicate and reflect on their design idea/s and identify similar products.

Throughout the process, using visual and other prompts, students identify and name materials, tools and safety equipment and describe their uses. Students develop an understanding of the links between equipment, safety and behaviours. They work in a guided, simple workshop/studio environment, and with supervision, learn to use one or more relevant technologies that relate to everyday activities.

Unit outcomes

By the end of this unit, students will:

- recognise differences in appearance between materials
- recognise different uses for different materials
- recognise design choices for different products exist
- apply design choices to develop a product
- develop and practice safe production skills
- apply production skills to make a product

Suggested learning activities

Within the broad area of introduction to design and production, teachers may choose one of the following projects as the main area of focus, with the flexibility to incorporate additional materials from outside the designated context. This will enhance and complement the development of knowledge and skills related to their understanding and use of materials.

The following suggested list of projects within each context is not exhaustive.

- metal: name tags, key rings, key tag, paper clip, small jewellery, such as bracelets, shaped brooches
- textiles: bookmarks, pencil cases, decorated singlet top, pyjamas bag, beach bag, make-up bag, shoe bag, hair and fashion accessories, simple garments.
- wood: small personal items, such as key holders, name tags, key rings, cutting boards, wooden paper peg, hot pot mat, small model toys

Unit content

This unit includes the knowledge, understandings and skills described below.

Common content

Materials

Nature and properties of materials

- identify, by appearance and name, materials within the chosen context
 - metals – steel, aluminium, copper
 - textiles – cotton, silk, wool
 - wood – softwood, hardwood, manufactured board
- identify basic aesthetic properties or characteristics, such as:
 - colour – bright, dull
 - appearance – patterned, plain
 - texture – soft, hard, smooth, rough
 - weight – heavy, light

Materials in context

- identify basic uses for materials within the chosen context
 - metals – kitchen utensils, workshop tools
 - textiles – clothing, household items
 - wood – furniture

Design

Design fundamentals and skills

- seek and discuss links between design processes and final products, such as design concept sketches compared to the finished product
- identify a product from its design and determine that the product and design are the same object
- use pre-prepared designs to make design choices
- decision-making: make design choices based on colour and shape

Use of technology

Skills and techniques

- use pre-prepared design in developing a solution
- use simple graphic communication technologies
 - 2D pencil sketches
 - colour drawings
- name and use basic equipment as appropriate to context
- manipulate materials
 - mark out parts/shapes
 - cut out and/or shape parts/shapes

- join or assemble
- finishing

Safety

- correct use of personal protective equipment (PPE) where applicable

Production management

- use teacher-directed design, production plans and processes
- with supervision, use simple tools and/or machines safely
- communicate and describe, in simple terms, the production process
- demonstrate workshop clean-up procedures

Metal context content

Use of technology

Skills and techniques

- name and use common tools chosen from, but not limited to, the following:
 - measuring tools
 - files
 - hammers
 - clamps and/or vice
 - hand tools for cutting
 - electric hand drill or pedestal drill/drill press
- demonstrate safe methods of drilling
- identify and use simple methods of joining metals chosen from, but not limited to, the following:
 - folding
 - pop rivet gun
 - adhesives
- prepare surfaces and apply a finish by brush, cloth and/or spray pack

Textiles context content

Use of technology

Skills and techniques

- demonstrate skills related to using a pattern
 - use a prepared or commercial pattern
- name parts of, and use, sewing machine and sewing equipment
- demonstrate machine skills
 - threading
 - straight stitch
 - zig zag

- demonstrate construction techniques chosen from, but not limited to, the following:
 - joining – open seam, closed seam
 - shaping – single dart, gathering
 - closures – centred zipper
 - finishing – machine hem, machine blind hem
 - pressing

Wood context content

Use of technology

Skills and techniques

- name and use common tools chosen from, but not limited to, the following:
 - measuring tools
 - saw
 - plane
 - mallet and chisels
 - clamps
 - belt/disc sander or orbital sander
 - scroll saw
 - electric hand drill or pedestal drill/drill press
- use hand tools to fabricate joints chosen from:
 - widening joint
 - butt or rebate joint
 - cross-halving joint
 - housing joint
- identify and use PVA adhesive
- prepare a surface and apply a finish by brush, cloth and/or spray pack

Unit 2

Unit description

This unit focuses on production fundamentals. At this stage, students typically have limited tactile experience of products and limited manufacturing experience. They make products, following a planned process, and may require assistance at each stage of the process to complete production. Using visual and other prompts, students follow instructions and provide a simple description of a product, as well as the tools required to produce it.

Students are introduced to the concept of design, and factors affecting design, through a simple design process, and with assistance, make simple design choices to manufacture the same or a similar product. They understand that a design concept is an idea of what a product may eventually look like, and that it is created through a design process.

Throughout the production process, students learn that products are made from certain materials and that materials can be named and described. With prompts and assistance they hold and use simple tools correctly and safely to assemble a product.

Unit outcomes

By the end of this unit, students will:

- recognise differences in appearance between materials
- recognise different properties for different materials
- recognise factors affecting design choices
- apply design choices to develop a product
- develop and practice safe production skills
- apply production skills to make a product

Suggested learning activities

Within the broad area of production fundamentals, teachers may choose one of the following projects as the main area of focus, with the flexibility to incorporate additional materials from outside the designated context. This will enhance and complement the development of knowledge and skills related to students' understanding and use of materials.

The following suggested list of projects within each context is not exhaustive.

- metal: name tags, key tag, shaped brooches, paper clip, small jewellery, such as bracelets
- textiles: bookmarks, pencil cases, decorated singlet top, pyjama bag, beach bag, make-up bag, shoe bag, hair and fashion accessories, simple garments
- wood: small personal items, such as key holders, name tags, key rings, cutting boards, wooden paper peg, hot pot mat

Unit content

This unit includes the knowledge, understandings and skills described below.

Common content

Materials

Nature and properties of materials

- identify, by appearance and name, within the chosen context
 - metals – steel, aluminium, copper, brass, tin, stainless steel
 - textiles – cotton, denim, linen, wool, silk
 - wood – softwoods, hardwoods, manufactured boards
- identify basic aesthetic properties or characteristics, such as:
 - colour – bright, dull
 - appearance – patterned, plain
 - texture – soft, hard, smooth, rough
 - weight – heavy, light

Materials in context

- within a chosen context, identify common materials and describe their uses
- name some products or objects made from common materials

Design

Design fundamentals and skills

- identify product/s and discuss:
 - factors affecting design, chosen from:
 - o personal likes/dislikes
 - o aesthetics – appearance, form
 - o function – purpose, use
 - o safety – design requirements
 - o cost – compare similar products
- seek and discuss links between designs and final products; for example, match representations of designs to drawings or photographs of finished products
- use a guided design method or pre-prepared designed components to develop own solution
- decision-making: make design choices based factors affecting design

Use of technology

Skills and techniques

- use a guided design method or pre-prepared designed components to develop own solution
- use basic graphic skills, such as desktop publishing and/or hand sketching with simple annotation
 - 2D pencil sketches

- colour drawings
- ICT drawing
- use appropriate terminology and conventions
- name and use basic equipment as appropriate to context
- manipulate materials
 - mark out parts/shapes
 - cut out and/or shape parts/shapes
 - join or assemble
 - finishing

Safety

- correct use of personal protective equipment (PPE) where applicable

Production management

- use teacher-directed design, production plans and processes
- with supervision, use simple tools and machines safely
- communicate and describe the production process in simple terms
- maintain progress to complete a finished product

Metal context content

Use of technology

Skills and techniques

- name and use common tools chosen from, but not limited to, the following:
 - measuring tools
 - files
 - hacksaws
 - hammers
 - clamps and/or vice
 - hand tools for shaping metals
 - electric hand drill or pedestal drill/drill press
- demonstrate safe methods of drilling
- identify and use simple methods of joining metals chosen from, but not limited to, the following:
 - folding
 - pop rivet gun
 - spot welding
 - adhesives
- prepare surfaces and apply a finish by brush, cloth and/or spray pack

Textiles context content

Use of technology

Skills and techniques

- demonstrate skills related to using a pattern
 - use a commercial pattern
- name parts of, and use, sewing machine and sewing equipment
- demonstrate machine skills
 - threading
 - straight stitch
 - zig zag
- demonstrate construction techniques chosen from, but not limited to, the following:
 - joining – open seam, closed seam
 - shaping – single dart, gathering
 - closures – centred zipper
 - finishing – machine hem, machine blind hem
 - pressing

Wood context content

Use of technology

Skills and techniques

- name and use common tools chosen from, but not limited to, the following:
 - measuring tools
 - saw
 - plane
 - hammer
 - mallet and chisels
 - clamps
 - belt/disc sander or orbital sander
 - scroll saw
 - electric hand drill
 - pedestal drill/drill press
- use hand tools to fabricate joints chosen from, but not limited to, the following:
 - widening joint
 - butt or rebate joint
 - cross-halving joint
 - housing joint
- identify and use PVA adhesive
- identify and use different fasteners
- prepare a surface for finishing
- apply a finish by brush, cloth and/or spray pack

Unit 3

Unit description

This unit focuses on production experiences. Students are introduced to principles and practices of design, and the fundamentals of design required to manufacture products for themselves. They communicate various aspects of the design process within the structure of 'design, make and appraise'.

Throughout the process, students learn about materials, including their aesthetic properties and suitability for purpose. Students use the technology process and are introduced to relevant technology process skills.

Students work in a defined, guided environment and learn to use a variety of production technologies safely and effectively.

Unit outcomes

By the end of this unit, students will:

- identify and name materials and their basic properties and uses
- discuss design choices and factors affecting design choices
- apply design fundamentals and skills to develop a product
- develop and practice safe production skills
- apply production skills to make a product

Suggested learning activities

Within the broad area of production experiences, teachers may choose one of the following projects as the main area of focus, with the flexibility to incorporate additional materials from outside the designated context. This will enhance and complement the development of knowledge and skills related to students' understanding and use of materials.

The following suggested list of projects within each context is not exhaustive.

- Metal
 - jewellery
 - household accessories
 - table accessories
 - garden tools/products
- Wood
 - clocks
 - display/photo frames
 - small personalised furniture
 - small step/seat
- Textiles
 - pillowcases
 - cushions
 - teenage bedroom items

- personal clothing
- knitting
- hand embroidery
- quilting

Unit content

This unit includes the knowledge, understandings and skills described below.

Common content

Materials

Nature and properties of materials

- identify by appearance and name materials within the chosen context
 - metals – types of steel, aluminium, brass, copper, tin, stainless steel
 - textiles – cotton, denim, linen, wool, silk, synthetics
 - wood – softwoods, hardwoods, different types of manufactured boards
- identify basic aesthetic properties or characteristics, such as:
 - colour – bright, dull
 - appearance – patterned, plain
 - texture – soft, hard, smooth, rough
 - density – heavy, light

Materials in context

- identify basic uses for materials within the chosen context
 - metals – kitchen utensils, workshop tools
 - textiles – clothing, household items
 - wood – furniture

Design

Design fundamentals and skills

- discuss
 - needs and wants
 - existing products
 - design fundamentals
 - o aesthetics
 - o function
 - o safety
 - o cost
 - factors affecting design
 - o aesthetics
 - o function
 - o social requirements
 - o environmental requirements

- devise
 - using communication techniques
 - sketching
 - annotating
 - sketches of personal product ideas, with development of images to a final solution
 - presentation of design choices and final design
- use guided and/or highly scaffolded design plans as the idea/plan for an eventual product
- evaluate
 - when discussing and devising design ideas
 - finished product against initial design

Use of technology

Skills and techniques

- develop basic graphic skills with simple annotation chosen from, but not limited to, the following:
 - coloured images cut and pasted
 - 2D pencil sketches
 - pictorial drawings
 - colour or rendered drawings
 - desktop publishing
 - ICT drawing
- use appropriate terminology and conventions
- name and use basic equipment, as appropriate to context
- manipulate materials
 - mark out parts/shapes
 - cut out and/or shape parts/shapes
 - join or assemble
 - finish product

Safety

- correct use of personal protective equipment (PPE) where applicable

Production management

- use teacher directed design, production plans and processes
- with supervision, use tools and machines safely
- communicate and describe the production process in simple terms
- manage processes to finish a product
- demonstrate workshop clean-up procedures

Metal context content

Use of technology

Skills and techniques

- name and use common tools chosen from, but not limited to, the following:
 - measuring tools
 - files
 - hacksaws
 - cutting tools
 - hammers
 - clamps and/or vice
 - hand tools for shaping metals
 - electric hand drill
 - pedestal drill/drill press
- demonstrate safe methods of drilling
- identify and use simple methods of joining metals chosen from, but not limited to, the following:
 - folding
 - pop rivet gun
 - spot welder
 - adhesives
- prepare surfaces for finish
- apply a finish by brush, cloth and/or spray pack

Textiles context content

Use of technology

Skills and techniques

- demonstrate skills related to using a pattern
 - use a prepared or commercial pattern
- name parts of, and use, sewing machine and sewing equipment
- demonstrate machine skills
 - threading
 - straight stitch
 - zig zag
- demonstrate construction techniques chosen from, but not limited to, the following:
 - joining – open seam, closed seam
 - shaping – single dart, gathering
 - closures – centred zipper
 - finishing – machine hem, machine blind hem
 - pressing

Wood context content

Use of technology

Skills and techniques

- name and use common tools chosen from, but not limited to, the following:
 - measuring tools
 - saws
 - planes
 - hammers
 - mallet and chisels
 - clamps
 - belt/disc sander or orbital sander
 - scroll saw
 - electric hand drill or pedestal drill/drill press
- use hand tools to fabricate joints chosen from, but not limited to, the following:
 - widening joint
 - butt or rebate joint
 - cross-halving joint
 - housing joint
- identify and use PVA adhesive
- identify and use different fasteners
- prepare a surface and apply a finish by brush, cloth and/or spray pack

Unit 4

Unit description

This unit focuses on design in practice. Students apply the fundamentals of design and concepts related to designing for particular needs or purpose. They communicate various aspects of the technology process within the context of making what they design.

Throughout the unit, students learn about the different materials, and the suitability of selected materials for a particular purpose. They are introduced to a range of production techniques and equipment, and develop skills, follow plans and realise their design ideas through the production of their design project.

Unit outcomes

By the end of this unit, students will:

- identify and name different materials and their different basic properties and uses
- discuss design choices and factors affecting design choices
- apply design fundamentals and skills to develop a product
- develop and practice safe production skills
- apply production skills to make a product

Suggested learning activities

Within the broad area of design in practice, teachers may choose one of the following projects as the main area of focus, with the flexibility to incorporate additional materials from outside the designated context. This will enhance and complement the development of knowledge and skills related to their understanding and use of materials.

The following suggested list of projects within each context is not exhaustive.

- Metal
 - jewellery
 - household accessories/products
 - table accessories
 - simple storage/shelving
 - garden tools/products
- Wood
 - clocks
 - toys
 - display/photo frames
 - small personalised furniture
 - small step/seat
 - household accessories/products

- Textiles
 - pillowcases
 - cushions
 - teenage bedroom items
 - personal clothing
 - knitting or hand embroidery
 - recycled garments
 - beach bags or evening bags
 - mobiles
 - household products

Unit content

This unit includes the knowledge, understandings and skills described below.

Common content

Materials

Nature and properties of materials

- identify, by appearance and name, within the chosen context
 - metals – ferrous, non-ferrous
 - textiles – natural fibres, manufactured fibres
 - wood – softwoods, hardwoods, and different manufactured boards
- identify basic aesthetic properties or characteristics, such as:
 - colour
 - appearance – patterned, plain
 - texture – soft, hard, smooth, rough
 - density – heavy, light

Materials in context

- identify, within a chosen context, common materials and describe their uses
- name some products or objects made from common materials

Design

Design fundamentals and skills

- discuss
 - design needs and wants
 - existing products
 - design fundamentals
 - o aesthetics
 - o function
 - o safety
 - o cost

- factors affecting design
 - aesthetics
 - function
 - social requirements
 - environmental requirements
- devise
 - using communication techniques
 - sketching
 - annotating
 - sketches of personal product ideas with development of images to a final solution
 - design choices based on design fundamentals
 - presentation of final design
- use guided and/or highly scaffolded design plans as the idea/choice/plan for an eventual product
- evaluate
 - when discussing and devising design ideas
 - finished product against initial design

Use of technology

Skills and techniques

- use a guided design method to develop own solution
- develop graphic skills, such as desktop publishing and/or hand sketching with simple annotation
- use tools and basic machinery
- manipulate materials by cutting, shaping, joining and finishing
- use appropriate correct basic terminology and conventions

Safety

- correct use of personal protective equipment (PPE) where applicable

Production management

- use simple tools and machines
- use teacher-directed design, production plans and processes
- communicate and describe the production process

Metal context content

Use of technology

Skills and techniques

- name and use common tools chosen from, but not limited to, the following:
 - measuring tools
 - files
 - hacksaws
 - hammers

- clamps and/or vice
- hand tools for cutting
- electric hand drill or pedestal drill/drill press
- demonstrate safe methods of drilling
- identify and use simple methods of joining metals chosen from, but not limited to, the following:
 - folding
 - pop rivet gun
 - spot welding
 - adhesives
- prepare surfaces for a finish
- apply a finish by brush, cloth and/or spray pack/spray gun

Textiles context content

Use of technology

Skills and techniques

- demonstrate pattern skills
 - use a commercial pattern
- name parts of, and use, sewing machine and sewing equipment
- demonstrate machine skills
 - threading
 - straight stitch
 - zig zag
- demonstrate construction techniques chosen from, but not limited to, the following:
 - joining – open seam, closed seam
 - shaping – single dart, gathering
 - closures – centred zipper
 - finishing – machine hem, machine blind hem
 - pressing

Wood context content

Use of technology

Skills and techniques

- name and use common tools chosen from, but not limited to, the following:
 - measuring tools
 - saws
 - planes
 - hammers
 - mallet and chisels
 - clamps
 - belt/disc sander or orbital sander

- scroll saw
- electric hand drill
- pedestal drill/drill press
- use hand tools to fabricate joints chosen from, but not limited to, the following:
 - widening joint
 - butt or rebate joint
 - cross-halving joint
 - housing joint
- identify and use PVA adhesive
- prepare a surface and apply a finish by brush, cloth and/or spray pack/ spray gun

School-based assessment

Approaches to assessment should support teachers to identify, broaden and deepen their understanding of what students can do, and assist teachers to determine the educational priorities for each student.

The unit content forms the basis of a teaching, learning and assessment program. The content points in each unit form the basis of teaching and learning opportunities for students, and also provide examples of assessable activities on which teachers can make informed judgements.

Teachers are required to develop an assessment outline for each unit.

The assessment outline must:

- include a set of assessment tasks
- include a general description of each task
- indicate the unit content to be assessed
- include the approximate timing of each task (for example, the week the task is conducted, or the issue and submission dates for a task).

To cater for individual needs and student capabilities, a range of assessment tasks will be developed by the teacher, appropriate for a student's expected ways of learning.

The assessment tasks will provide opportunities for teachers and students to reflect on progress towards individual learning goals. Teachers make decisions about each student's readiness to progress to the next level of proficiency on his or her individual learning goals using a range of assessment tools.

Tools for the collection of evidence to support student progress towards individual learning goals may include:

- observation rubrics
- oral and/or written tasks, or any combination of oral and written tasks
- work experience feedback and/or reports.

Decisions about whether it is appropriate to offer adjustments to students in course work and assessment tasks are the responsibility of the school.

Unit completion

Schools report on each student's learning progress for a unit in Preliminary courses as either completed or not completed.

To be deemed to have completed the course, the school determines whether a student meets the following criteria:

- completion of the education and assessment program for the unit (unless the school accepts that there are exceptional and justifiable circumstances)
- evidence of progress in demonstrating the unit outcomes, including sufficient attendance and engagement, either independently or with support.

The WACE Manual contains essential information on principles, policies and procedures for school-based assessment that needs to be read in conjunction with this syllabus.