School administrators and Heads of Learning Area – Materials Design and Technology and teachers of Materials Design and Technology ATAR Year 12 are requested to note for 2024 the following minor syllabus changes. The syllabus is labelled 'For teaching from 2024'.

Materials Design and Technology | ATAR Year 12 | Summary of minor syllabus changes for 2024

The content identified by ~~strikethrough~~ has been deleted from the syllabus and the content identified in *italics* has been revised in the syllabus for teaching from 2024.

Organisation of content

Use of technology

- Production management
  - product manufacture
  - ongoing ~~evaluation~~ *client consultation.*

Design

Design fundamentals and skills

A foundation of design knowledge is critical when developing projects. Concepts related to aesthetics, human factors and consumer markets are covered. Aesthetics include elements of line, shape, form, texture, colour and tone; and principles of unity, ~~variety,~~ proportion …

The course incorporates cognitive and creative skills that are used in generating ideas and developing solutions, such as rapid concept development, brainstorming, critical thinking and collaborative designing. It covers strategies for thinking ~~laterally,~~ innovatively and creatively …

Production management

Production management

Various skills are required to successfully manage the production process. ~~Performance must be evaluated throughout.~~ Environmental factors, including management and reduction of waste and energy efficiencies must be considered. Project management of ~~time,~~ tasks and materials as well as task modification ~~and record keeping~~ are employed throughout the production process~~;~~. ~~t~~Therefore, management skills, principles of quality assurance, ongoing evaluation~~,~~ and testing are all important factors in ensuring quality outcomes. Communication skills are also important. Working collaboratively with team members~~, maintaining work schedules and time plans,~~ and producing various oral and written communications are all important aspects of the production process.

Unit 3

Design

Design fundamentals and skills

- devise
  - production plan
    - materials list
    - estimated and actual costing for all materials and components
    - production plan~~, including time line~~
- evaluate
  - ~~product against design brief, initial design and performance criteria related to needs, values and beliefs of the developer and end user~~
  - design and production processes, making recommendations for improvement *through client consultation*

Use of technology

Skills and techniques

- ICT, folio development and communication skills
  - client and market research techniques
  - client presentation techniques
  - ~~photography – ongoing record of progress and processes used and final product~~
  - documenting presentations and ~~evaluations~~ *client consultation*

Production management

- *independently* manage ~~independently~~ production processes
  - *apply* ~~maintain~~ a production plan in order to manage processes and meet time constraints
  - adapt planned actions, equipment and resources to complete production
  - apply production techniques that reduce material wastage
  - ~~consider client feedback, and modify production processes accordingly~~
  - document and record changes to materials lists and/or changes to actual cost of materials
- ~~diary, journal and folio note entries, including~~
  - ~~ongoing evaluation of production processes and techniques~~
  - ~~use of photography and notes to record ongoing progress/decision changes made to the project~~

Metal context content

Materials

Nature and properties of materials

- ~~how atomic (crystalline/grain) structure of steel contributes to the physical properties~~
- relationship between a metal's ~~atomic~~ structure and physical/mechanical properties to justify selection of materials for a manufactured product

Materials in context

- impact *that* production, processing and use of metals has ~~had~~ on society and the environment
  - ~~historical impacts~~
  - ~~current impacts~~

Use of technology

Skills and techniques

- operate ~~a~~ metal ~~lathe~~ *working machines/equipment* and ~~MIG welder~~ *welding equipment*
- investigate the use of CAD/CNC technologies in the metals industry
- investigate, ~~test,~~ select and apply appropriate metals decoration, embellishment and manipulation techniques

Textiles context content

Materials

Nature and properties of materials

- fibre morphology and structure
  - physical characteristics~~,~~ *and* microscopic appearance~~, amorphous, crystalline, monomer, polymer, polymerisation~~
  - ~~how molecular and morphological structure contribute to the properties of fibres~~
- discuss yarn structures

Materials in context

- impact *that* production, processing and use of textiles has ~~had~~ on society and the environment
  - ~~historical impacts~~
  - ~~current impacts~~

Use of technology

Skills and techniques

- investigate, test, select and apply appropriate construction techniques for manufacturing products
  - marking out
  - cutting
  - shaping
  - joining
  - closures
  - finishing
- operate ~~a~~ sewing machine~~s~~ and ~~overlocker~~ equipment
- investigate the use of CAD/CNC technologies in the textile industry
- investigate, ~~test,~~ select and apply appropriate fabric decoration, embellishment and manipulation techniques

Wood context content

Materials

Nature and properties of materials

- wood form and structure
  - ~~how cellular structure of hardwoods and softwoods contributes to the properties of timber~~

Materials in context

- impact *that* production, processing and use of timber has ~~had~~ on society and the environment
  - ~~historical impacts~~
  - ~~current impacts~~

Use of technology

Skills and techniques

- demonstrate procedures for setting up, adjusting and operating ~~all~~ machinery used in the production of a project
- ~~operate a router and table saw~~ *operate wood working machines and equipment*
- investigate the use of CAD/CNC technologies in the furniture/cabinet making industry
- investigate, ~~test,~~ select and apply appropriate timber finishing application techniques

Unit 4

Common Content

Design

Design fundamentals and skills

- ~~investigate~~
  - ~~target audience/market, demand, niche market design needs, values and trends~~
  - ~~performance criteria related to needs, values and beliefs of the developer and end user~~

- ~~historical, social, cultural and political sources of design inspiration~~
- ~~design fundamentals and factors affecting design~~
  - ~~aesthetics~~
  - ~~function~~
  - ~~safety~~
  - ~~cost~~
  - ~~environmental impact and considerations~~
  - ~~sustainability issues~~
  - ~~ergonomics~~
  - ~~anthropometric data~~
- devise
  - production plan
    - ~~materials list~~
    - ~~estimated and actual costing for all materials/components~~
    - ~~production plan, including time line~~
    - *document changes made to production planning*
    - *record and explain the difference between proposed time and actual time taken; or record and explain the difference between estimated and actual costing of the product*
- evaluate
  - ~~product against design brief, initial design and performance criteria related to needs, values and beliefs of the developer and end user~~
  - ~~design and production processes making recommendations for improvement~~
  - *design and production process, identifying and explaining problems and solutions proposed or applied*
  - *product against the statement of intent*

Use of technology

Skills and techniques

- ICT, folio and communication skills in:
  - client and market research techniques
  - client presentation techniques
  - ~~photography, for ongoing record of progress and processes used, in creating final product~~
  - *annotated photographs of all views of the final product and all features of the final product*
- ~~apply methods of testing materials and techniques as required~~

Production management

- *independently* manage ~~independently~~ production processes
  - maintain a production plan to manage processes to meet time constraints
  - adapt planned actions, equipment and resources to complete production
  - apply production techniques that reduce material wastage
  - consider client feedback, and modify production processes accordingly
  - document and record changes to materials lists and/or changes to actual cost of materials
- ~~use regular journal, diary and folio entries, including:~~
  - ~~ongoing evaluation of production processes and techniques~~
  - ~~use of photography and notes to record ongoing progress and changes made to the project~~

Metal context content

Materials

Nature and properties of materials

- ~~characteristics of at least one metal innovation and emerging technology~~
  - ~~light weight metals~~
  - ~~specialty alloys~~
  - ~~composites~~
- *identify and explain uses for at least one metal innovation and emerging technology*

Use of technology

Skills and techniques

- *independently* operate ~~independently a metal lathe and welding equipment~~ *metal working machines and equipment*
- investigate new technologies and new production processes in the metal fabrication industry
- investigate, ~~test,~~ select and apply appropriate metals decoration, embellishment and manipulation techniques

Textiles context content

Materials

Nature and properties of materials

- ~~characteristics of at least one textile innovation and emerging technology~~
  - ~~bamboo~~
  - ~~microfibre~~
  - ~~washable webs~~
  - ~~nanotechnology~~
  - ~~computer linked sewing machines~~
  - ~~seamless technology~~
- *identify and explain uses for at least one textile innovation and emerging technology*

Use of technology

Skills and techniques

- ~~independently operate a sewing machine and overlocker~~ *independently operate sewing machines and equipment*
- investigate new technologies and new production processes in the textile industry
- investigate, ~~test,~~ select and apply appropriate fabric decoration, embellishment and manipulation techniques

Wood context content

Materials

Nature and properties of materials

- ~~characteristics of~~ *identify and explain uses for* at least one timber innovation and emerging technology
  - ~~biodegradable materials~~
  - ~~composite and laminate materials~~
  - ~~fast growing timbers – paulownia, bamboo~~

Use of technology

Skills and techniques

- ~~independently operate a router and table saw~~ *independently operate wood working machines and equipment*
- investigate new technologies and new production processes in the furniture/cabinet making industry
- investigate, ~~test,~~ select and apply appropriate timber decoration, embellishment and manipulation techniques

Assessment table practical component – Year 12

Documentation and ~~**P**~~ ***p*roduction**

~~Types of evidence can include: observation checklists and evaluation tools (self or peer), photographic images, journal entries, and on-balance judgements.~~

Types of evidence can include: production documentation: materials list, budgets, 2D and 3D illustrations, design specification sheets, and production plans; manufactured final product and/or components of products, photographic images and on-balance judgements.

~~**Final product evaluation**~~ ***Response – Visual evidence of production***

Typically conducted at the end of semester and/or unit and assessed against the ~~planned design brief.~~ *statement of intent*

Students are assessed on their:

- ~~manufactured finished product in terms of quality and finish~~
- ~~summary of evaluation of final product against design brief, initial design and/or performance criteria related to needs, values and beliefs of the developer and end user.~~
- *folio cover page, photographs final finished product*
- *labelled and annotated final product photographs*
- *labelled and annotated photographs of all features of the final product*

Assessment table written component – Year 12

Design (written)

Design process in which students conduct and communicate a ~~design proposal~~ *statement of intent* and ~~investigation~~ *research.*

Students are assessed on how they:

- ~~develop and present a statement of intent or design proposal~~
- ~~apply research strategies to source, investigate, analyse and evaluate relevant images, with referenced data and information~~
- ~~apply design fundamentals related to proposed solutions to meet client needs and the design problem or situation~~
- ~~document research and evaluate existing products during the design process~~

~~Types of evidence can include: annotated images, observation checklists, evaluation methods (self or peer), portfolio, journal entries, design proposals and project proposals using a range of written communication strategies.~~

- *develop and document a statement of intent, including application of the design fundamentals to meet the client's needs*
- *prepare a summary of either a client interview or market research undertaken*
- *prepare a summary documenting research of design inspiration and influences*

- *prepare a summary documenting research of materials and justifying suitability of selected materials*

Types of evidence can include: statement of intent; documenting constraints and considerations, client's requirements, design fundamentals, and writing performance criteria; summaries of client interviews, market surveys, design inspiration and influences, materials research and testing; design portfolio, using a range of written communication strategies.

Response – *Final product Evaluation*

~~Students apply their knowledge and skills in responding to a series of stimuli or prompts in the following formats: assignment papers, essays, ICT visual responses and/or product evaluation reports.~~

Students are assessed on their:

- *evaluation of their design and production processes*
- *explanation of problems identified, and solutions proposed or applied, possible improvements*
- *evaluation of their final product against the statement of intent*

Practical (portfolio) examination design brief – Year 12

Supporting information

~~The candidate is required to submit a portfolio that documents the development of a completed design process. The material, including images in the portfolio, should demonstrate the development from the initial design brief through to the finished product, and show the quality of the final product.~~

~~The portfolio must provide evidence of the candidate's ability to:~~

- ~~apply design fundamentals and use designing skills to create or modify products, processes, systems, services or environments to meet human needs and realise opportunities~~
- ~~understand the key stages of the technology process~~
- ~~apply technology skills to produce a quality product.~~

The candidate is required to submit a portfolio that documents the entire design process. This includes photographs that evidence the quality of the final product and its features.

The design portfolio should:

- *demonstrate the development of a statement of intent*
- *provide analysis of extensive research of the client and/or market*
- *provide analysis of research of design inspiration and influences and materials selection*
- *provide evidence of and showcase the design development, production documentation and planning*
- *provide photographic evidence of steps in the production process, the final product and its features*
- *provide evidence of evaluation of the design and production processes and the final product against the statement of intent.*