**Sample Course Outline**

Materials Design and Technology

ATAR Year 12

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Sample course outline

Materials Design and Technology – ATAR Year 12

Unit 3 and Unit 4

Semester 1

| **Week** | **Key teaching points** |
| --- | --- |
| 1–3 | **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
 | * + environmental impact and considerations
 |
| * + function
 | * + sustainability issues
 |
| * + safety
 | * + ergonomics
 |
| * + cost
 | * + anthropometric data
 |

**Task 1:** Establish a design process and design portfolio; statement of intent, investigate and devise through the development of a design portfolio. Develop a statement of intent or design proposal |
| 4–5 | Task 2: Investigate design proposal, client needs, market survey, design fundamentals and factors affecting designNature and properties of materials As per Unit 3 context content Nature and properties of materials **Task 3:** Investigate and report on the nature and properties of materials * research and identify the nature and properties of materials suitable for the development of a solution in context, as per Unit 3 of the syllabus
 |
| 6–9 | **Design fundamentals and skills*** devise
	+ using communication and documentation techniques
	+ sketching and drawing
	+ rendering
	+ annotating drawings
	+ sampling
	+ modelling
	+ applying elements and principles of design where applicable in context

|  |  |  |  |
| --- | --- | --- | --- |
| * + line
 | * + colour
 | * + rhythm
 | * + dominance
 |
| * + shape
 | * + tone
 | * + radiation
 | * + proportion
 |
| * + form
 | * + repetition
 | * + harmony
 | * + balance
 |
| * + texture
 | * + gradation
 | * + contrast
 | * + unity
 |

* + applying rapid concept development techniques to generate a variety of design ideas
	+ design development
	+ collate best ideas that have been developed using annotated hand or computer-generated graphics – front, back views and detailed sketches as necessary
	+ review and justify best ideas using design brief and performance criteria
	+ 2D illustrations – working/technical drawings
	+ 3D illustration – presentation drawings
	+ inspiration/concept/storyboard development and presentation
	+ 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

Use of technologySkills and techniques* ICT, portfolio 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
* context appropriate drawing and relevant technical information to produce the final product to demonstrate:
	+ sketching rapid concept developments
	+ 3D presentation drawings
	+ rendering techniques
	+ 2D working drawings or using templates
	+ inspiration/concept or storyboard development and presentation
	+ design and making specification sheets

**Task 4:** Devise and develop concepts through concept drawings, patterns or templates**Task 5:** Devise a solution through working drawings, patterns or templates **Task 6:** Presentation drawing of proposed solution – colour-rendered pictorial 3D drawing, either CAD or hand drawn**Task 7:** Production management plan; prepare materials list, estimated and actual costing for all materials/components, production plan and time line |
| 10–13 | **Use of technology*** workroom/studio terminology appropriate to context
* operate machinery and tools appropriate to context

**Safety*** correct use of personal protective equipment (PPE) where applicable
* conduct risk assessment for using specific tools and equipment
* demonstrate occupational safety and health (OSH) practices appropriate to tasks being undertaken in workshops
* apply proactive measures for risk management in the workshop/studio
* recognise need and purpose of materials safety data (MSD) with regard to storage and handling of hazardous substances appropriate to situation

**Production management*** manage production processes independently
* diary, journal and folio note entries

**Task 8:** Pre-production skills – task/s to demonstrate safe working practices and develop practical hand and machine skills through modelling, prototype or toile making **Materials in context*** factors that have affected manufacturing processes
* impact production, processing and use of materials has had on society and the environment

**Task 9:** Research materials in context, as per syllabus context content dot points |
| 14 | Preparation for production and/or examination |
| 15Examination week | Task 10: Semester 1 Written examination – a representative sample of the syllabus content from Semester 1 – using a modified examination design brief from the syllabus – length two and a half hours |

Semester 2

| **Week** | **Key teaching points** |
| --- | --- |
| 1–2 | **Materials in context*** influence of globalisation on the local, national and international industries
* research and analyse relationships between product innovation, lifestyle choices, and consumer demand
* explore green design principles and the life cycle of a product

**Nature and properties of materials**As per context content such as* analyse context materials
* test materials’ properties
* characteristics of innovations and emerging technology
* finishing processes

As per Unit 4 context content dot points **Task 11:** Research materials in context* investigate and report on the materials in context
* research and identify the nature and properties of materials suitable for the development of a solution in context, as per Unit 4 syllabus dot points
 |
| 2–9 | **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
* apply graphics skills in:
	+ sketching, including rapid concept development
	+ 3D presentation drawings
	+ rendering techniques
	+ 2D working drawings or using templates
	+ inspiration/concept or storyboard development and presentation
* produce specification sheets
* apply methods of testing materials and techniques as required
* use design and production procedures to integrate materials
* apply skills in reading, interpreting and adapting plan/patterns/templates appropriate to context
* independently operate machinery and tools appropriate to context
* use clear, detailed presentation skills to set out, develop and present a folio featuring all elements of the design process

**Safety*** correct use of personal protective equipment (PPE) where applicable
* occupational safety and health (OSH) practices appropriate to tasks being undertaken in workshops
* apply proactive measures for risk management in the workshop/studio
* recognise the need and purpose of materials safety data (MSD) with regards to storage and handling of hazardous substances
* discuss the consequences of hazardous operations and identify and manage risks in and around the workshop/studio
* examine OSH issues and legal implications associated with designing and producing materials products for the consumer market

**Production management*** manage production processes independently
* diary, journal and portfolio note entries

**Task 12:** Production managementManufacture proposed product. Use prepared production plan, materials and available equipment; record progress in design portfolio |
| 10–11 | **Design fundamentals and skills*** justify selection of materials against comprehensive design needs, as well as the functional and aesthetic properties of materials
* 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

**Task 13 Part A:** Practical final product evaluationEvaluation of completed product; written report on, and photographs of the completed product |
| 12 | **Task 13 Part B:** Portfolio presentation and final product presentationPreparation for completed portfolio – submission; last week of SeptemberPreparation for examinations |
| Examinationweek  | **Task 14:** Semester 2 Written examination – a representative sample of selected syllabus content – using the examination design brief from the syllabus – length two and a half hours |