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COMPUTER GRAPHICS AND DESIGN
TEACHING & LEARNING SUPPLEMENT

INDEPENDENT SCHOOLS TASMANIA

TASMANIAN CATHOLIC education office

Tasmanian Government

ADVICE FOR TEACHERS

This document helps to describe the nature and sequence of teaching and learning necessary for students to demonstrate achievement of course outcomes.

It suggests appropriate learning activities to enable students to develop the knowledge and skills identified in the course outcome statements.

Tasks should provide a variety and the mix of tasks should reflect the fact that different types of tasks suit different knowledge and skills, and different learning styles. Tasks do not have to be lengthy to make a decision about student demonstration of achievement of an outcome.

COURSE SPECIFIC ADVICE

This *Computer Graphics and Design* Level 3 Teaching and Learning Supplement must be read in conjunction with the *Computer Graphics and Design* Level 3 course document and relevant External Assessment Specifications and Examination Guidelines.

It contains advice to assist teachers delivering the course and can be modified as required. This Teaching and Learning Supplement is designed to support teachers new to or returning to teaching this course.

Computer Graphics and Design Level 3 equips learners for working in the digital age through the development of design thinking and problem solving skills. In a future that will be characterised by rapid and continuing advances in digital technologies where visual solutions are central to the way people use, share, develop and process information, learners need to learn the skills to utilise such technologies to solve problems and visually communicate knowledge and ideas. Learners will work within the computer graphics context, applying their understanding of form and function to develop design solutions.

Computer Graphics and Design Level 3, develops learners' capacity to solve complex problems and effectively use project management skills to collaborate and meet deadlines. Such skills are essential in existing and future work environments and are particularly relevant for learners seeking careers in design-based industries.

Computer Graphics and Design, while associated with the Design and Technology strand of learning, also incorporates, and provides, rich learning opportunities to embed skills and knowledge from the fields of arts, maths and sciences. In doing so, *Computer Graphics and Design* provides potential for the engagement of integrated learning opportunities and the capacity to develop skills to effectively transfer knowledge and understanding across disciplines.

COURSE CONTENT

Learners must complete the units in the order below.

	Unit Title	Indicative times
Unit 1	Design Extension	30 hours
Unit 2	Design Studios	70 hours
Unit 3	Extended Project	50 hours

TEACHING AND LEARNING ACTIVITIES

Unit 1   *Design Extension*

Learners will gain an understanding of a broad range of factors which impact on design from a local, national and global perspective. Learners develop insights into how design is culturally, socially and ethically constructed with an environmentally sustainable approach. Consideration is given to influences by social and cultural factors, and past and contemporary practices when proposing design solutions.

Learners will analyse and select communication strategies to undertake the design process and communicate their ideas and understandings through the process of design development, analysis of iterations and the presentation of a final product. Project management techniques and processes will be analysed and applied to manage design projects.

Examples of learning activities

Learners:

- lead a class discussion about how attributes of a product are valued differently by the designer, manufacturer and end-user/s. Use a relevant blog or article to support and give examples
- refer to case studies to gain knowledge about environmental, social and economic sustainability issues associated with products. Produce marketing material to highlight sustainability of a product
- work through a process of describing form, space and void by measuring, documenting and annotating an existing structure or object within your home environment. Exchange this documentation with a fellow learner. Finally, produce the presentation drawings of this unseen structure or object solely from the information passed to you.
- working in teams, investigate the social and political factors and influences of one key period that saw significant growth in visual communication design: post industrial revolution, post second world war or the digital revolution. Examine that period for its characteristics and define its key points. Play the music and read articles and stories from the period. Individually, create a mood board displaying key styles, fashions and a chart of popular period colours. Use this mood board as an inspiration base for creating a contemporary infographic presentation that describes visual communications from that period. Explain the social and cultural settings and describe the visual communications in terms of how manual and/or digital methods, media, materials, design elements, design principles and presentation formats were applied. Identify the connections between that period and contemporary visual communications practices
- define a target audience, describing key characteristics. Investigate and gather samples of patterns in spending behaviours and interests that link to the client.

Compile a cohesive visual reference that illustrates the visual language of this target audience. Make quick sketches from these references to help identify design elements and principles that are used to unpack a brief

- establish a class debate on the topic of 'Most influential design of the 20th century'. Select and research a product or object and present a debate or case as to why this product/object is the most influential in recent time based on how it has created, caused or influenced positive change
- conduct interviews with digital design practitioners within the community. Discuss the types of work undertaken, the processes followed and skills applied. Investigate whether collaboration or support is provided by other specialists. Present an oral report to the class with visual support
- analyse the work of designers in the way materials, media or methods have impacted on the aesthetic or functional qualities. Describe how alternative materials, media or methods may have impacted on the design and the reasons for the decisions made by the designer
- practise writing 'reverse briefs'. Discuss the aesthetics and function of a building, object or visual communication (including print or web) and try to articulate the need in terms of its purpose, aesthetics and function rather than by referring to its name. For example, a bicycle could become a 'human-powered wheeled vehicle'. Use a creative thinking technique to begin that product's design generation by suggesting a range of alternative forms and structures that could achieve the same or better outcome
- consider and reflect on the needs of a client. Identify a group of clients such as people in different locations, different cultural groups and people of different ages. Research a variety of design versions of the same product –from cheap mass-produced to high-end design. Make a grid to identify how each product might or might not suit each client. Finally, suggest what the dream version of the product would be for each client
- co-construct an agreed set of protocols to use within the class when critiquing others' work
- investigate a range of decision making processes/protocols suitable to use in a small group when designing collaboratively. Working in small groups test three of these processes/protocols and demonstrate the preferred one to the rest of the class
- develop negotiation skills by practising active listening, empathy and paraphrasing to structure conversations within design groups

Resources   IDEO Design Thinking resources
https://www.ideou.com/pages/design-thinking-resources

Interaction Design Foundation 5 step design thinking approach
https://www.interaction-design.org/literature/article/5-stages-in-the-design-thinking-process

Design Thinking for Educators toolkit
https://designthinkingforeducators.com/

Stanford School Design Thinking resources
https://dschool.stanford.edu/resources/

The right way to do collaborative design
http://99u.com/articles/51643/the-right-way-to-do-collaborative-design-how-to-avoid-designing-by-committee

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Unit 2   *Design Studios*

This Unit is the content basis for working within *Computer Graphics and Design*. Learners must study the core design studio 3D Modelling and at least two of the elective design studios from the following:

- o   Interactive Design
- o   Solid Modelling and 3D Digital Fabrication
- o   Video and Motion Graphics
- o   Animation
- o   Asset development, game design and production.

Examples of learning activities

Learners:

- explain how the end-user/s influences the designer in the product design process for digital fabrication
- identify and employ a range creative, critical and reflective design thinking strategies
- select an idea from visualisation drawings and develop further by using creative design thinking strategies such as SCAMPER or 'Forced Associations' to encourage divergent thinking and to develop design options
- redesign a simple hand-held and/or operated household object to be more ergonomically suited for a person with arthritis; e.g. plastic lemon juicer, secateurs or an electric toothbrush. Produce a series of freehand drawings from direct observation, and a dimensioned third-angle orthogonal drawing to scale. Render drawings to observe existing materials and explore alternative materials; show form using a range of media such as marker and colour pencils revealing the effect of light, shade and shadow
- select and apply a range of design elements, design principles, manual and digital methods, materials, conventions and media appropriate to different purposes, audiences and contexts to fulfil design briefs
- analyse an existing piece of digital design using annotations on screen shots. Repurpose aspects of this work to fulfil another purpose

Resources   Computer Graphics Society
http://www.cgsociety.org/

YouTube Autodesk channel
https://www.youtube.com/autodesk

Unit 3   *Extended Project*

Using computer generated graphics, or digital content, in the field of design, each learner will undertake an extended design project.

To complete the extended project learners must:

- construct a clear, concise design brief
- follow a structured iterative design process as in a commercial setting
- implement project management techniques to fulfil the project requirements within the allocated time frame

- prepare a presentation and written analysis for external assessment
- use contemporary digital design methods in the presentation of the project.

Examples of learning activities to support the Extended Project

Learners:

- create an extensive mind map of possible areas of interest; investigate a selection of areas to identify possible design problems and potential communication needs. The use of social media platforms can be used to gather 'research for inspiration' and retain the original source for acknowledging and referencing in the design process
- generate a research plan from the design brief by identifying each area within the brief that a designer needs to find out more information about.
- develop a scheduled production plan that outlines the steps needed for production, an estimate of time for each step, and the date scheduled for completion
- apply a synectic approach to creative thinking when ideating (subtract, repeat, combine, add, transfer, substitute etc.)
- investigate different formats for creating action plans. Consider the advantages and disadvantages of each and make a recommendation as to which one might suit you best to use for projects.
- set SMART goals when undertaking a design process
- identify and explore five self-management techniques that can be used in undertaking the extended project.

Resources   Helping students learn project management
http://www.spencerauthor.com/helping-students-learn-project-management/

WORK REQUIREMENTS

Unit 1	Design Extension	1. Introductory collaborative design project
Unit 2	Design Studios	1. One Design Project focusing on Digital Imaging and 3D Modelling 2. One design project focusing on Elective 1 3. One design project focusing on Elective 2
Unit 3	Extended Project	1. Externally assessed extended design project

NOTE
All websites cited were accessed and checked for accuracy and appropriateness of content and were current as of January 2018.

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