

## COMPUTER GRAPHICS AND DESIGN (CDG315118)

### FEEDBACK FOR STUDENTS AND TEACHERS

#### FOLIO

"A back to base marking" is now the standard method for the assessment of design folios. Overall presentation and documentation of design folios was similar to the previous year. Almost all folios were submitted in accordance with the folio guidelines as either a single PDF format or with contemporary interactive tools. A small number of students did not follow the guidelines and presented a collection of files to describe their design process. Some questions arise over the inability to determine if interactive folios have been worked on by students after the folio due date. A few students continued to submit paper-based folio content which was contrary to the published TASC project guidelines that specified the submission of all project content in a digital format. This content was ignored. Some folios were difficult to assess due to their lack of consistency in their presentation format. It is much easier to assess a folio where the structure is: brief, precedents, concept development, production, final project, essay plan, essay and evaluation.

"Contemporary design" is a key requirement for a design folio. A small number of projects lacked an understanding of the meaning of "contemporary design". Some projects with military or medieval themes were not examples of "contemporary design" unless there was an explicit connection to design contexts such as interactive game environments. In many instances such projects also lacked a maturity in design thinking. Highly successful projects again illustrated a completeness in terms of the design process in addressing the folio criteria. Some candidates continue to confuse quantity over quality by exceeding the 40-page limit in their folio as set out in the project guidelines. It is better to undertake a smaller and less ambitious design project and do it well rather than undertake a design project that is clearly too ambitious for the designated 50-hour design time and the student's capabilities. In such circumstances the folio and project often lacked finesse in the design development and resolution.

The writing of a coherent and correct design brief remains a weakness for several folios. The design brief is the foundation of the design project and must have a reference to the context, the anticipated target audience, functional intentions and intended methods of presentation of the project outcome.

Students who had a well written design brief in almost all cases achieved a successful and coherent design project outcome.

The research or precedents phase of the project design process is a critical step in the analysing of the project brief and is a foundation for further design development. Stronger projects had well researched precedent content that was well annotated and well connected to the design intention of the brief. This assisted in developing sound design solutions. Several candidates continue to not understand the importance of this phase of the design process with poorly articulated precedent research that lacked a clear connection to the design brief and an inadequate reflection of design elements and principles. Many candidates could look wider than just relying on web searches for design inspiration. Taking their own photos of buildings, products, logos etc. is encouraged as is seeking inspiration from printed books and magazines.

Exploration and experimentation by design sketching, be it with pencil or with digital tools, is a critical part of the design process. It provides opportunities for students to fully develop an understanding of their design intention before the production phase and to fully explore appropriate application of design principles and elements. Stronger candidates clearly demonstrated the capacity to explore and experiment with ideas. They also demonstrated a process of reflection and refinement to achieve a coherent final design solution in readiness for the production phase. These design sketches were well annotated, communicating effective design thinking. A significant number of candidates did not produce design sketches to the standard expected of the course. These were often poorly annotated and did not conform to visual communication standards. Candidates need to provide evidence of the evolution of the design idea and not just focus on one idea. A few candidates also needed to enhance the scans of their design sketches to make them more readable in their folio. Design sketching is a skill that needs to be explicitly practised by candidates. A good test of whether a design has been fully/adequately resolved is that an examiner or a third party should be able to produce the design from the material provided with appropriate computer graphics tools.

Most candidates provided annotated screen grabs of their production process with appropriate annotation and commentary that communicated terms and vocabulary relating to CGI. These are critical in proving the authenticity of the students' work. No screen grabs of the production process or

ones with little or no specific commentary relating to actual processes do not provide the required evidence of authenticity of student generated computer graphics.

It is important that candidates apply correct computer graphic production processes. Most candidates applied both appropriate compression codecs and contemporary aspect ratios in animations. Selection of appropriate image resolution of completed design content is an important consideration as is fully resolved design outcomes. High level projects demonstrated skilled application and production of digital content across a diversity of contexts.

Stop motion, video based and web layout type and some types of game-based projects often lacked the required Computer Graphic content to satisfactorily meet criterion 8. Such projects should be avoided unless the candidate is prepared to add a significant amount of student generated digital content.

The industry analysis essay was well completed by many candidates and made the connection between the design context of the project and computer graphics related design and production methods. In addition, several candidates also discussed relevant social and environmental contexts relating to their project areas. Unfortunately, there continues to be a number of essays where this connection is absent and where there is a just a discussion of the industry area of the project without any connection to a computer graphics and design context. It was pleasing to see less instances where essays were more a first-person commentary of the student's own design process. The industry analysis essay should be in an academic essay format with correct referencing and of the required word count.

Most candidates applied appropriate academic integrity principles in their folios with correct referencing of content sources in both the folio design process and in the industry analysis essay.

Several students did not understand correct referencing requirements. A web link without additional reference such as the source and date of access is not a correct reference nor is a reference to a Google or Bing image search result. Imagery and content used in precedents or initial design research should be referenced in the project documentation against the sources as well as listed at the end of the project folio documentation. The 2018 Project Guidelines were quite specific stating, "Students will be penalised against criterion 5 if referencing conventions are not appropriately used."

Many candidates produced a sound evaluation/reflection of their design outcomes in response to their design brief. This is an important step in the design process to reflect upon learning and the process. Candidates who did not provide such an evaluation/reflection had an incomplete design process.

Approximately 6% of candidates presented folios that would be considered exemplars that achieved the highest possible ratings. These folios were strong with the design process and illustrated a high-level application of the principles and elements of design associated with the selected design context.

In summary a high-level folio would contain:

- A design brief that clearly articulates the design intention, context, functional considerations and potential target audience
- Comprehensive annotated research of precedents connected to the design brief
- An exploration and evaluation through design sketching of a diversity of ideas leading to a clearly resolved final design intention
- Annotated screen grabs of the production process that effectively communicate insight and understanding of techniques and processes used
- An industry analysis essay that makes the link between the design context and computer graphics processes that conforms to academic integrity requirements
- An evaluation/reflection that reflects the learning and outcomes of the design intention
- A complete and resolved project that applies a diversity of appropriate computer graphics process and conforms to industry standards of the design context with correct referencing of content sources not generated by the student

## EXAM

### QUESTION 1

This question was attempted by many candidates. Most understood that moving light 1 to another position changed the light and shadows being cast on and by the object. Weaker responses generally just described how the changing the light position would cast a stronger shadow on one side of the object. Stronger responses indicated the original light set up clearly illuminated both sides of the object and if shadow casting was turned on there would be light shadows on each side. Upon moving light 1 the two lights would cast a stronger shadow on one side and create “blown” highlights on one side of the object unless the intensity of the lights were adjusted.

### QUESTION 2

This question was attempted by relatively few candidates, with many of those producing a satisfactory response. Weaker responses only addressed one part of the question or contained general jargon with little specific detail. Stronger responses discussed advantages and disadvantages and provided examples to support their argument.

### QUESTION 3

This question was answered by the majority of students, with a pleasing level of success. Most candidates were able to identify that the image had been created with raster graphics and suggest that vector graphics would be more suitable. High standard responses gave a detailed description of both raster and vector graphics and were able to provide software examples, i.e. Adobe Photoshop (raster) and Adobe Illustrator (vector). Furthermore, “A” responses also discussed the resolution of the image, as raster graphics cannot be scaled up or down without the loss of detail.

### QUESTION 4

A generally well answered question with an array of answers ranging from converting wire frame models into 2D images and discussion of the process involved in creating 2/3D images or animation. Stronger answers discussed photon mapping and final gather and the slowness of the render depending on the detail.

### QUESTION 5

This question was answered by a number of candidates with most identifying the effects were created using a particle system. Stronger responses discussed the need for a particle emitter controller and how it assigns different parameters to influence the way in which they act.

### QUESTION 6

This question was popular with candidates. Very few described in technical terms what they would see on the timeline such as components of the animation being separated by layers with keyframes and tweens on each object's layer timeline indicating points in time as to what will change from frame 1 to frame 50. Most just described changes evident in the two images with no reference to what would be seen on the animation timeline.

### QUESTION 7

The vast majority of candidates attempted this question with nearly all showing a good level of understanding about the application of Cyan, Magenta, Yellow and Key (Black) inks during the printing process. Many candidates distinguished between CMYK and RGB systems highlighting the respective subtractive and additive nature of the systems and identifying CYMK as being associated with printed displays while RGB is normally used in emissive devices such as monitors, televisions and phone screens.

### QUESTION 8

This was a quite popular question with most candidates citing monitors and printers as output devices. 3D printers, projectors, VR headsets were also identified as output devices. A surprising number of candidates incorrectly identified input devices such as the computer mouse, graphics tablet and keyboard as being an *output* device.

### QUESTION 9

This was a popular question with a number of candidates. Weaker responses discussed what currently exists within most apps with little or no discussion on how to solve the overuse syndrome. Stronger responses included the need to build pauses into game apps. Word suggestions, finger scanning, gesture control, and swipe scrolling were common responses.

### QUESTION 10

This was a generally well answered question for those who attempted it. Common responses discussed the need to push the boundaries of the existing design without compromising the integrity of the existing design. Several students identified that the use of the letters M and W in the second concept would not readily identify with non-English speaking individuals.

### QUESTION 11

This question was generally well answered by candidates who clearly identified the related issues of copyright and intellectual property as being at the core of the question. Many candidates elaborated their answers by referring to the moral and legal implications of using unauthorised content in a commercial setting.

### QUESTION 12

This was a popular question with many candidates incorrectly identifying generic items as being “design classics”. Pencils, doors, windows, tables, chairs, bricks etc. were all incorrectly identified as design classics. The term “design classic” is defined as “an industrially manufactured object with timeless aesthetic value. It serves as a standard of its kind and remains up to date regardless of the year of its design”. In this context, the Volkswagen Beetle, Swiss Army knife, Levi’s Jeans, the Alessi Kettle, the Le Corbusier lounge, the Porsche 911, the Coke bottle and the Volkswagen Kombi Van are examples of design classics. Generic commonly used items that have existed for a long time are not necessarily regarded as classics unless their origin can be traced back to an original design regarded as being an inspiration source for “lookalike” products.

### QUESTION 13

This question was generally well answered by most candidates making the connection between the ideas of form and function and the inter connection with visual tactile and aesthetic design factors. Higher quality responses explained that user needs of an object drive the design considerations of that object in their justification.

#### QUESTION 14

This question was well answered by candidates for the greater part indicating ideas such as motion sensors to lock the screen, use of audio connected feedback common among GPS enabled devices, the ability to issue audio commands, the use of simplified forms of on screen graphics and device mounting mechanisms similar to a traditional GPS device.

#### QUESTION 15

This question yielded very few quality responses. Most candidates simply described the features of current online shopping sites, such as the use of 'categories' to organise products or online chat features. Higher level responses were able to suggest more technically advanced features such as Augmented or Virtual Reality and explain how this would improve the shopping experience for the user.

#### QUESTION 16

Candidates were generally able to articulate some advantages of researching historical design products, however, there were few high-quality responses. Strong responses included discussion of advantages such as; allowing a direct link from inspiration to design ideas, opportunity to explore aesthetic and functional design features, analysing strengths and weaknesses of historical and developing designs and to give the designer focus and direction.

#### QUESTION 17

This was a quite popular question that was generally answered to a reasonably good standard. Most candidates identified the tactile requirements for the product to function appropriately. Many design solutions featured an indented 9 chamber tray and play pieces with embossed "nought" and "cross" textures. Several candidates included bright illumination and alternate colours for users with limited visual perception. Some candidates suggested an electronic audio feedback to notify players when there was a winning arrangement. Alternate use of smooth and rough textures was also suggested as an additional way to help players identify the respective playing pieces. Higher quality answers featured rendered 3D presentations such as two point perspective or isometric drawings that included texture, colour and shadowing characteristics. Most candidates made appropriate use of annotations in their drawings.



### QUESTION 18

This was a popular question which yielded few quality responses. In order to receive a high result all three aspects of the question needed to be addressed. “A” responses articulated the required steps in the design process, design principles and elements, as well as social and ethical issues and were accompanied by two clearly drawn and annotated design solutions. High-quality responses included 3D sketches and the use of colour, whilst low-quality responses included 2D pen or grey lead pencil drawings with little clarity or refinement present.

### QUESTION 19

Very few candidates attempted this question and few were able to effectively communicate design intentions. Many students presented designs based on an existing product with little or no consideration to breaking down components in order for them to be printed and assembled. Stronger answers took into consideration intellectual property and safety when the designer does not control the printing process. Several solutions required large industrial type printers to produce the product which did not fit the requirements of a home 3D printer.

### QUESTION 20

This question was answered by a small number of candidates. Most candidates produced an appropriate storyboard and mentioned that relevance in the future could be achieved by not assigning any specific time or location to the advertisement. Success or failure of other advertising campaigns could be achieved through mechanisms such as market research and feedback to determine which campaigns resonated with the target audience. High level storyboards had clear well-constructed narratives and indicated camera angle, position and movement for each scene supported by annotation of any dialogue and other audio related components. They were also neatly drawn for a clear understanding of the design intention.

### QUESTION 21

This question was very popular. Weaker responses confused Augmented Reality (AR) with Virtual Reality (VR) and thus the essay presented was deemed irrelevant to the topic. Augmented reality alters the perception of a real-world environment, whereas virtual reality completely replaces the real world. Strong responses were able to give a clear description of AR, compare it to VR, discuss appropriate devices and applications, provide examples of current trends and discuss potential areas of development such as transforming education and building/design industries.

### QUESTION 22

Very few candidates attempted this question. Responses demonstrated how the process of solid modelling occurs through the creation of wireframes using x,y,z axes which then has surfaces added to them. Many candidates were unable to expand on or explain the range of manufacturing techniques used by industry. Common responses discussed CAM and included examples in the use of CNC milling, laser cutting, routing, and 3D printing.

### QUESTION 23

This question was answered by approximately half the candidates. Most answers were appropriately written in a structured essay format. The better-quality answers made extensive use of specific examples of software functions while less able candidates tended to make generalised statements that lacked relevant supporting examples. A good essay answer will, in many cases, use paragraphs that commence with a definition of the key concept to be covered, followed by a relevant industry-based example that discusses a product or software process as well as a connecting statement that substantiates the intent of the question.

### QUESTION 24

This question was well answered by the small number of candidates who attempted it. They described how a render farm is a connected set of systems that is used to produce distributed rendering of complex projects in a productive manner. High level responses described how a render farm is structured and how network management of the rendering farm distributes and manages the rendering tasks to the network and how CPU and GPU capabilities affect the productive capacity of the data processing of renders.

### QUESTION 25

This question was answered by a small number of candidates. Better-quality responses indicated an inter-connectedness between bones, inverse kinematics and motion capture. They described how bones can be connected and in character-based animation drive the overlying geometry of the character and how inverse kinematics is a key component to the bone rig in driving motion along the chain of connected bones. Examples such as moving a hand which changes position of the bones connected through the arm were cited. Motion capture techniques were in general well described and how the resultant captured motion is used to create animation in the bones of the skeleton of a character. Some candidates also mentioned how rotoscoping is another relevant technique.

### QUESTION 26

This question was answered by one candidate. The response indicated how deflectors and collision detection is particularly relevant in physics engines and how collision detection using deflector objects are an important component in simulating physical behaviour of phenomena such as water, fire, fog etc. in particle system development.