

ASSESSMENT REPORT 2022

CGD315118 – COMPUTER GRAPHICS AND DESIGN

FOLIO

All folios must be submitted in accordance with the [folio guidelines](#) as a single PDF format, or in ZIP format that included a PDF format file of the design process and a video format file. Students and teachers must read the published TASC folio guidelines to ensure submitted projects conform to these requirements. Overall presentation, documentation and quality of design folios were of a more consistent standard compared to the previous year. Folios had a coherent and logical sequence of communication with a standard design process, and a well-connected industry essay. It is also advised to ensure a cover page with the project title, the student's TASC ID number and an image of the final design is included.

Highly successful folios again illustrated a completeness in terms of the design process in addressing the folio criteria. A small number of students continue to confuse quantity over quality. It is advised 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 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.

This year there was an improvement in the design brief or proposal. The design brief is the foundation of the design project. It is advisable that students provide a short statement outlining the set expectations and goals for the project as "The Brief", and then provide supporting information with a design scenario (with an intended "client"), and give reference to the context or main design idea, the anticipated target audience, functional intentions and intended methods of presentation of the project outcome. Students with a coherent design brief, in almost all cases, achieve a successful 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, well-connected and analysed with design language to the design intention of the brief. This assisted in developing strong design solutions. Some students did not fully 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. Images (such as diagrams, drawings, photos, icons and plans) that are not the student's own work must be referenced/cited. This should be done below (or beside) the image. If the image was created or taken by the student, this should be clearly noted too (e.g. 'Student's personal photo <date of creation>') so as to clearly differentiate the work of the student from the work of others.

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. This aspect of the design process is critical and was not strongly displayed in many design projects. These were often poorly-annotated and did not conform to visual communication standards. For example, orthographic or multi-view representations should be set out according to standard layout conventions for such representations. Stronger responses clearly demonstrated the capacity to explore and experiment with ideas. They also demonstrated a process of reflection and refinement in order to achieve a coherent final design solution in readiness for the production phase. These design sketches were well-annotated, communicating effective design thinking. They provided clarity around what needs to be done when the computer graphics is produced. Students needed to provide evidence of the evolution of the design idea and not just focus on one idea. Some students 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 students and taught by teachers. 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.

The majority of students provided annotated screen grabs of their production process. Students who supported screen grabs with appropriate annotation and commentary about specific computer graphic based content generation techniques provided that extra level of evidence of understanding of production processes. These are critical in demonstrating the authenticity of the student's work. Screenshots should include the capture of toolbars/menus along with their model to provide evidence of authenticity. When there are no screen grabs of the production process, or ones with little or no specific commentary relating to actual processes, this does not provide the required evidence of authenticity of student generated computer graphics. It is advised that students provide a list and screenshots of imported assets created by an outside provider, and reference these in order to make it clear what is the student's own work and what has been imported.

It is important that students apply correct computer graphic production processes. Most students 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. A number of students presented rendered images and animations that had significant noise present in them. Students need to be able to adjust render settings rather than just rely on a default setting in global illumination-based image renderers. High level projects demonstrated skill application and production of digital content across a diversity of contexts. Markers were pleased to see some projects were a series of still images put into a video type presentation format, as this provides a more coherent method of displaying the student's design outcomes. Adding suitable music or sound effects also enhances the animated content. The submission of a screenshot as the final product is not deemed an appropriate final presentation or production technique.

Logo based, and some types of game-based projects often lack the required computer graphic content to satisfactorily meet Criterion 8. Such projects must be avoided, unless the student is prepared to add a significant amount of student-generated digital content. Projects that were presented as a 3D format were more likely to attract a higher rating than a 2D logo, as it enabled the student to demonstrate a greater range of skills. For a logo, it is advised to incorporate the design into a product in order demonstrate a greater range of skills.

The industry analysis essay was well-completed by many students and made the connection between the design content of the project and computer graphics related design and production methods. It is recommended that the essay is placed at the end of the folio presentation, as a number of folios had it embed in the middle of the folio, which affected the flow of the design process and overall presentation. Unfortunately, there still continues to be several student essays where the connection with computer graphics and design context is absent and where there is just a discussion of the industry area of the project. It was pleasing to see very few instances where essays were more a first-person commentary of the student's own design process. The industry analysis essay is an academic format essay with correct referencing in the preferred Harvard format and of the required word count.

Most students 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.

Many students 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. Students who did not provide such an evaluation/reflection had an incomplete design process.

Approximately 6% of students presented folios that achieved the highest possible ratings. These folios communicated a strong 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 contains:

- A design brief that provides a short statement outlining the set expectations and goals for the project as “The Brief”, and then provides supporting information with a design scenario (with an intended “client”), that clearly articulates the design intention, context, functional considerations and a potential target audience.
- Comprehensively annotated research of precedents connected to the design intention of the project brief. An exploration, experimentation 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 communicates insight and understanding of the computer graphics techniques and processes used.
- An industry analysis essay that makes a strong link between the design context and computer graphics processes that conforms to TASC academic integrity requirements.
- An evaluation/reflection that reflects the learning and outcomes of the design intention in response to the design brief.

- 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.

WRITTEN EXAM – SECTION A

QUESTION 1

50% of students answered this question. Most students answered this question satisfactorily, with only 7% of students who chose this question giving unsatisfactory answers. The strongest answers annotated their sketches carefully with accurate reference to Design Elements and Principles used and the social norms associated with these (such as reds and yellows for danger).

QUESTION 2

81% of students answered this question. 97% of students that selected this question answered satisfactorily or better. Strong answers accurately listed emotions and moods commonly associated with oranges and yellows. The strongest answers gave examples of this in practice.

QUESTION 3

47% of students attempted this question. More than three quarters of students submitted a low to medium quality answer, which in most cases largely re-iterated the key premise of the question (that good designs take into account environmental issues in their material use). Higher-order answers looked more specifically at carbon emissions and other environmental waste issues in material and component manufacture, likely life of the product and options for disposal and re-use of materials at the end of the object's life cycle. Some better answers also considered transport and distribution consequences associated with sourcing of materials and components in the context of a transport carbon footprint for the product.

QUESTION 4

22% of students attempted this question. Very few students gained an “A” rating, with a clear majority being assessed at “C” standard. The key aspect of this question is the knowledge that the creator by default owns the intellectual property, at least until such time as they have entered into a contractual agreement with the client, which formally transfers ownership to the client. Many answers talked about the need for referencing to avoid plagiarism issues. Such comments indicated a lack of clear understanding of the intent of the question.

QUESTION 5

This question was answered by a medium number of students. Most were able to answer satisfactorily, although there was a small percentage of students whose understanding was limited and who didn't understand sustainability beyond very basic environmental considerations. Stronger answers discussed sustainability holistically, discussing environmental, social and economic factors against the

life cycle of a product. These included the use of energy in production, transportation and use of the product. Also, the choice of materials, including where and how they are sourced and disposed of, and how much material is used and wasted during the production process. Quality answers also discussed the longevity of a product both in terms of durability and desirability.

QUESTION 6

This question was answered by a medium number of students. Most were able to answer satisfactorily with very few students providing an unsatisfactory response to this question. There is no right or wrong answer to this question, results were determined based on the student's ability to communicate and justify their opinion. Stronger responses articulately justified the importance of **ease of use in comparison to user desirability**. Many students drew a comparison to the design statement 'form follows function', with stronger responses discussing how ease of use and user desirability work in tandem during the design process of a successful product.

QUESTION 7

Students who answered this question did so with a clear insight and understanding why environmental and functional considerations are important to good design. Common responses discussed sustainable energy such as wind or solar. Stronger responses discussed water storage, wastewater management and the use of building materials that are sustainably sourced and have low environmental impact during construction.

QUESTION 8

80 % of students attempted this question. Stronger answers developed design solutions that were not detrimental to the environment in construction and were easily recycled at the end of the life span of the chair. Common responses included the need to be ergonomically functional and structurally strong and be comfortable to sit on. Other responses discussed the need to be stackable and easily cleaned.

QUESTION 9

Slightly more than half of students attempted this question. More than three quarters of that group appear to have misinterpreted the question to produce **either** an isometric **or** a perspective drawing when, in fact the question was seeking **both**. 28% of students who attempted this question were unable to communicate a satisfactory understanding of both isometric and perspective drawing methods.

QUESTION 10

Slightly less than half of students attempted this question, with a sound range of answers being produced. More than a third of students produced an answer at either "B" or "A" standard. Typically, good answers were able to identify the format acronym (e.g., GIF, JPEG, PNG etc.). Better answers were able to provide the full title of the acronym, describe whether or not the format used "loss

less” or “lossy” compression, as well as to provide examples of applications where a given file type was most suited.

QUESTION 11

29% of students answered this question. Only 60% of students that selected this question answered satisfactorily, with many students instead responding with everything they had learned about Vector graphics when compared to Raster graphics, which the question was not referring to. Vector format image files are **not** an appropriate output for a “High Quality Rendered 3D Image” and few students discussed why banding may have occurred in an 8-bit quality image. The strongest answers discussed colour depth and range, compression and the use of higher bit format images to avoid banding created by compression, especially in gradients.

QUESTION 12

80% of students answered this question. 84% of students that selected this question answered it satisfactorily or better. The question was generally well-answered, with the strongest answers referring to orthographic view port layouts, front, top, side and perspective view, and the ability to view your scene in different modes such as shaded, wireframe, textured, lit and unlit simultaneously.

QUESTION 13

This was a popular question, with two thirds of students attempting it. Every response displayed at least a basic level of understanding of the terms **vertex**, **edge** and **face**; however, a number of students were not able to communicate their understanding effectively, e.g., using the word face to describe the face, or edge to describe an edge. In these instances, diagrams were useful for the student to communicate their understanding visually. Many students only answered the first part of the question defining the terms but did not explain their role in producing graphic content. Stronger responses were able to explain how in combination vertices, edges and faces become the basis for creating and manipulating polygon-based 3D models and objects.

QUESTION 14

Approximately a third of students who attempted this question were unable to answer it satisfactorily. These students misinterpreted what the question was asking and discussed the role of key frames in the animation of fire, leaves, water and clouds. The question was looking for the student to discuss how particle systems are used to animate in a 3D modelling environment. Stronger responses were able to identify this and discuss the aspects of particle systems and the process followed when animating with them. These included students discussing particle emitters, spawning rates, initial velocity and direction. Some students also discussed how parameters like the physics within and environment can be used to affect the particles.

QUESTION 15

This question was well answered by the small number of students who answered it. In relation to

pose to pose, strong responses discussed how the animator plans the animation by figuring out what to draw as the key poses first as the significant points of action and then inbetweening other actions through intermediate frames. Straight ahead, students demonstrate how the animator draws one frame after another.

QUESTION 16

This question was answered by approximately a third of students. They described how layers allowed for individual editing of elements by separating different parts of a drawing or scene. Stronger responses discussed how a layer or multiple objects could be locked or frozen. Groups allow for the ability to combine objects for editing scaling and moving etc. Stronger responses discussed how effectively using layers and groups improved productivity and management of complex drawings or scenes.

QUESTION 17

Very few students attempted this question, and few were able to effectively communicate design intentions. Stronger responses discussed how client consultation is required to develop a brief along with factors contributing to sun exposure e.g., social demographic, strategies to reduce sun exposure. Strong storyboards included what elements would be live footage or animated, camera pans, voice overs and music. Students discussed the need for client feedback, refinement and finalization of storyboard before going into production.

QUESTION 18

This question was attempted by one quarter of all students producing a typical spread of marks. Better answers featured at least one 3D design sketch that was rendered, annotated and supported by a comprehensive list of decisions and consultations, which would typically be required in the preliminary stages of the design process. Less successful responses commonly failed to identify the need for **two** alternative design solutions, with some of that group incorrectly assuming that two views of the same object constitute “two designs”.

QUESTION 19

Approximately a third of students attempted this question and almost all students were able to produce a satisfactory response. Every student answered all three parts of the question, to varying qualities. Stronger Item a) responses were able to discuss the importance of understanding a foreign culture and market when designing a product for it. They also discussed the importance of material choice for packaging and ensuring that all advertising is honest and accurate with no false claims being made. Whilst no students discussed copyright, it is an important ethical consideration and should be a part of this discussion. Item b) generally wasn't answered well by students, with many responses discussing the process vaguely, or focussing on aspects of the process like production which are not relevant to Criterion 6. Stronger responses discussed the process or understanding the target market and the product and how this knowledge should be used to influence the development of ideas. Item

c) was the most consistently well-answered section of the question. Stronger responses sketched three separate ideas in pencil, using colour to enhance their design. Some students did not annotate their design effectively or at all. Weaker annotation would label a red circle as a 'red circle' while stronger annotation would state why the red circle had been used in the design with a discussion of relevant elements, principles and symbolism.

QUESTION 20

23% of students answered this question. 96% of students that selected this question answered it satisfactorily or better. Some students' answers for item (a) of this question showed only a cursory understanding of the design process and little attention to social and ethical considerations when targeting a younger audience. The strongest answers for item (b) of this question were careful to sketch both the Front and Side views to scale and ensured they addressed details such as body, facial features and typical clothing, annotating in detail how these reflected certain personality traits as outlined by the question.

QUESTION 21

While only 12% of students answered this question, half of the responses to it were above satisfactory standard. 85% of responses were satisfactory standard or better. The strongest responses demonstrated a clear understanding of the differences between the three different production methods (Polygon-based modelling, digital sculpting and 3D scanning), the advantages and disadvantages of each and accurate examples of when it might be best to use each. For example, digital sculpting being an excellent choice for crafting organic objects, while 3D scanning is an inappropriate choice when trying to create an asset that doesn't exist in the real world.

QUESTION 22

Only 17% of students attempted this question. Quite remarkably half of that cohort achieved "A" standard results with a further third gaining "B" ratings. All students were able to define and describe both motion capture and rotoscoping, were able to clearly articulate the methods employed in each and were also able to provide specific industry examples of where these technologies are commonly used.

QUESTION 23

12.5% of students attempted this question. Almost all students were able to produce a satisfactory response. The question had two parts to it, explain the process of 3D printing, and discuss the benefits of 3D printing to the design process. The first part of the question was well-answered with students communicating a good understanding of the process of 3D printing, discussing the initial stage of modelling a design in 3D, exporting a design as an STL file so it can be prepared into slices before the file is sent to the printer where each layer of slice is then printed. Stronger responses also discussed how 3D printing was an additive manufacturing process. The second part of the question was often not well-answered, with many students discussing it only in vague terms or not at all. Stronger

responses discussed the benefits of rapid prototyping to the design process, particularly in relation to testing an idea. Some students also discussed the how 3D printing enables products to be produced using complex shapes with less waste than other manufacturing methods.

QUESTION 24

This question was well-answered by the small number of students who answered it. The majority of students described the production processes in terms of pre-production, production and post-production. Stronger response discussed industry examples and software used and the benefits of combining 2D and 3D content from the point of view of cost and time consideration to complete an animation.

QUESTION 25

Students who answered this question did so with a clear insight and understanding why games assets are produced within a game engine and the advantages and disadvantages of producing within the game or outside. Good responses discussed the limitations of file formats that effect importing into another game. Strong responses discussed how some game engines used sophisticated systems to produce game assets. Extensive mesh creation and editing toolset that included subdivisions surfaces and dynamic sculpturing tools.

QUESTION 26

This question was attempted by 25% of students and all students were able to produce a satisfactory response. All students were able to effectively discuss the similarities and differences of Virtual Reality (VR) and Augmented Reality (AR) to some degree. Stronger responses were able to articulate their comparison clearly, providing good common place example for both. The second part of this question – the application of VR and AR in architecture and retail - was less comprehensively answered. Many applicants provided example of AR and VR being used in areas which did not relate to architecture and retail. Stronger responses provided examples of how both technologies are being applied in these industries. these included how retail is using AR to enhance their online and instore shopping experience. It can be used to view additional details about a product, try clothing on remotely or to view a product in your home before purchase. While in architecture it can be used to understand and communicate how a new building will fit within the existing landscape. VR is being used to communicate designs more effectively, allowing clients to experience a space prior to it being built.