ASSESSMENT REPORT 2021

CGD315118 – COMPUTER GRAPHICS AND DESIGN

FOLIO

The submission of folios through TRACS is now the standard process. Almost all folios were 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. Some project submissions were submitted as a series of different video files which should be easily compiled into one video file for assessment. We advise candidates and teachers to read the published TASC project 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 the folio guidelines with a well-connected industry essay. It is advised that projects have a cover page with the project title, the candidate's TASC ID number and an image of the final design included. It was advantageous for candidates to present a simple animation to showcase the student's final design by including the video file as a separate file rather than a link embedded in the design process within the project documentation. This enables the examiners to quickly gain a sense of the student's design outcome instead of looking at a number of images/video files embedded in the project's design process documentation.

Highly successful projects again illustrated a completeness in terms of the design process in addressing the folio criteria. A small number of candidates 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, documentation and resolution.

The writing of a coherent and correct design brief or proposal was an improvement on previous years. The design brief is the foundation of the design project, candidates should provide a short statement outlining the set expectations and goals for the project as "The Brief" and then provide support information with a design scenario with an intended "client", 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 achieves a successful design project outcome.

The research or precedents phase of the project design process is critical in analysing the project design brief and is the foundation for the design development. Stronger projects had well researched precedent content that was well annotated, well connected and analysed within design language showing connection and analysis against the intention of the brief. This assisted in developing strong design solutions.

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A few candidates did not fully understand the importance of this phase of the design process and presented poorly articulated precedent research that lacked a clear connection to the design brief and an inadequate reflection of design elements and principles. Referencing research images should be located with the image and if created or taken by the candidate should be acknowledged, to avoid confusion in regarding its authenticity.

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. Sketches 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 candidates 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 provide a clarity of what needs to be done when the computer graphics is produced. 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 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.

Most candidates provided annotated screen grabs of their production process. Candidates who supported screen grabs with appropriate annotation and commentary about specific computer graphic based content generation techniques provide an extra level of evidence of understanding of production processes. These are critical in proving the authenticity of the student's 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. Students provide a list and screenshots of imported assets created by an outside provider and referenced in order to make it clear what is student content and what has been imported.

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. A number of candidates presented rendered images and animations that had significant noise present in them. Candidates 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. It was good 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 candidate's design outcomes. Adding suitable music or sound effects also enhances animates content.

Video based projects with no student generated digital design content, web layout type, some logo design 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 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 industry relevant to computer graphics related design and production methods. In addition, several candidates also discuss relevant social and environmental contexts relating to their project areas. Unfortunately, there continues to be several candidate essays where this connection is absent and where there is just a discussion of the industry area of the project without any detailed research or connection to a computer graphics and design context. 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 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. The overall standard of the application of TASC academic integrity requirements was an improvement from 2020. There were few instances of just a web link without additional reference such as the source and date of access not referencing to a Google or Bing image search result.
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 5% of candidates presented folios that would be considered exemplars that achieved the highest possible ratings. These folios communicated a strong design process and illustrates a high-level application of the principles and elements of design associated with the selected design context. In summary, a high-level folio shall contain:

- A design brief that provides a short statement outlining the set expectations and goals for the project as "The Brief" and then provide support information with a design scenario with an intended "client", that clearly articulates the design intention, context, functional considerations ana potential target audience.
- Comprehensively researched and 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.
- A researched 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 digital 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

This question was answered by over half of the students with slightly over 30% of students receiving a T result. High level responses drew both orthographic and parallel perspective views to scale. Satisfactory responses drew at least either the orthographic or the parallel perspective view accurately. Many candidates struggled with the parallel single point perspective view. Unsuccessful attempts were unable to draw either the three angles required for the orthographic view or the parallel perspective view.

Question 2

This question was answered by most of the students with a pleasing level (92%) of success. Satisfactory responses were able to define the primary difference between raster and vector-based graphics as being a grid-based pixel system (raster) compared to a mathematical formula-based lines and curve system (vector). More than half of candidates that answered this question were highly successful as their answers elaborated on which systems were better suited to scaling or not and why. The most successful answers gave examples such as Vectors being a good choice for Logo design and Typography.

Question 3

This question was answered by about a quarter of the candidates. At a minimum, correctly identifying two different raster type file formats was required for a satisfactory result. Some students were able to expand on this with accurate explanations as to what instances they are best suited for and why.

Question 4

This question was attempted by approximately one third of candidates. More successful answers mentioned that quad polygons subdivide more efficiently, generally produce better quality renders and animations. A number of candidates answered with little more than a paraphrasing of the question, resulting in a "D" assessment. Higher level answers resulted in "B" and "A" assessment ratings.

Question 5

Relatively few candidates attempted this question with approximately half achieving competent answers and the remainder falling short of an accurate response to the question. The key to a successful answer was in knowing that HDRI stands for "High Dynamic Range Image". A key point is that HDRI provides a very realistic lighting of a scene as opposed to the inclusion of virtual lighting.

Question 6

This question was attempted by approximately one half of candidates. More capable answers came from those candidates who typically provided definitions and examples of the application of Rotoscoping and Motion Capture. Weaker answers often stated that "motion capture is a method of capturing motion" without providing specific details of the technologies used in those processes. One third of candidates were unable to provide clear definitions and/or examples of these technologies.

Question 7

Several candidates attempted this question, and a number did so very successfully, demonstrating the difference between Solid and Surface modelling. Stronger responses re solid modelling discussed the techniques of creating a 3D model and adding or subtracting from it using range of tools, while examples for surface modelling discussed tools such as lofts, sweeps and NURBS curves.

Question 8

This was a very popular question and was well answered by most candidates. High level responses included clear and concise written responses along with good 3D sketches demonstrating the difference between adding, subtracting and intersection of 3D primitives.

Written Exam - Section B

Question 9

Many candidates attempted this question. Better answers focused on fashion trends, labelling requirements, marketing ethical standards, ethical employment in factories, concerns regarding hiding of alcohol / illegal substances, environmental concerns regarding material source and disposal / recycling aspects. Weaker answers typical touched on only one of the above without covering the broader elements of the question.

Question 10

41% of candidates attempted this question. Better answers mentioned the need to acknowledge the original author and to identify whether the downloaded material is for education / research / commercial purposes. Majority of candidates produced a satisfactory or better than satisfactory response to the question.

Question 11

Slightly more than half the candidates attempted this question. Weaker answers mostly paraphrased the question, often simply saying that people prefer products that last a long time. The candidates focus was on an individual product as opposed to a design that consumers could continue to enjoy through multiple products over a longer time period. Stronger answers approached the question from a "design classic" perspective citing the Coca Cola logo, Swiss Army Knife and Levi Jeans as examples of timeless designs. The key message was "avoid being too fashionable" in order to minimize risk of locking the product into a specific (and finite) era.

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Question 12

This question was answered by over half of the candidates. A few students were unable to articulate any design-based explanation as to why a designer might look at and reference historical ideas and instead rephrased the question as an answer. Successful candidates gave answers such as 'Inspiration', 'Methods of production', 'Analysing success or failure' and 'emulating an era'. Highly successful candidates gave more than one correct answer, and the most successful candidates gave examples to demonstrate understanding.

Question 13

This question was only attempted by a quarter of the candidates. Most candidates answered this question successfully. Satisfactory answers included references to life cycle, manufacturing process, materials, recyclability and durability. More than half of the candidates listed three or more of these examples and the higher level responses provided good examples of these to demonstrate understanding.

Question 14

Over half of the candidates attempted this question with 90% of them receiving a satisfactory result or better. Some candidates provided results that would have scored higher, but they were either missing the sketch aspect of the answer or selected design elements or principles not listed in the question. The most successful responses accurately referred to the cross-cultural response elicited by certain colours (such as danger being associated with red), reflective textures being a way to catch the eyes for important warning signs so as not to be missed and bold lines to emphasise importance or demonstrate motion where appropriate.

Question 15

Candidates who answered this question did so with a clear understanding of how to reduce or minimize waste from 3D printers. Most responses discussed the need to ensure that the geometry of the model was correct prior to printing and the recycling of failed print filament. Stronger responses included the use of plant-based bioplastic along with the use of 100% recycled cardboard spools.

Question 16

Candidates who answered this question did so with a clear insight and understanding why useability is an important design consideration. Good responses discussed how the user interactive interface achieved a defined goal effectively, efficiently and satisfactorily.

Written Exam - Section C

Question 17

Many students attempted this question. Stronger answers developed design solutions directly linked to their design consideration with detailed discussion of the elements and principles used in their design solution. The use and discussion of colour/material and detailed annotations in the design solutions enhanced the discussion of elements and principles. Higher standard responses were able to discuss environmental, social and ethical factors in their response.

Question 18

Very few candidates attempted this question, and of those, few were able to effectively communicate design intentions. In order to receive a high result all three aspects of the question needed to be addressed. Strong 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 preliminary annotated designs showing front and side view of the mascot. High quality responses included 3D sketches and the use of colour, while low quality responses included unannotated 2D pen or grey lead pencil drawings with little clarity or refinement.

Question 19

28% of candidates attempted this question and approximately half produced good quality answers resulting in "A" or "B" ratings. Such answers featured good quality 3D design sketches (isometric or perspective) showing two alternate designs as well as a detailed analysis of the issues to be considered during the research phase of such a project. Weaker answers often failed to provide details of *two* alternative design concepts.

Question 20

14% of candidates attempted this question. Of those, only one candidate did not receive a satisfactory result or better for their response. Most candidates overlooked the importance of client consultation when developing a brief and thus received satisfactory results. The most successful candidates both referred to client consultation when developing a brief and research of factors such as congestion and environmental impact, as well as including well annotated and easy to follow story boards that gave consideration and justification for camera position, movement and timing of shots.

Written Exam - Section D

Question 21

18% of candidates attempted this question. Satisfactory responses outlined the core differences between polygon modelling and digital sculpting and when one was more appropriate than other. The more successful responses to this question demonstrated a deeper understanding of the differences by outlining some of the tools used in each and by giving good examples (particularly of when digital sculpting was more appropriate such as in organic and character modelling). Unfortunately, some students veered off topic when answering this question and gave hyperbolic and at times inaccurate analysis in an attempt to inflate their answers.

Question 22

9% of candidates attempted to answer this question, of those only two accurately referred specifically to the process of Match Moving while all other candidates used the terms Match Moving interchangeably with Motion Tracking and as a result only discussed with one specific aspect of the process. As a result, six students received satisfactory results for this question. Two students demonstrated an understanding of Motion Tracking to such a high degree that they were still able to receive a B result. Two students demonstrated an understanding of the differences between and applications of the terms Match Moving and Motion Tracking.

Question 23

No candidates attempted this question. In order to write a detailed essay answer on this topic a good understanding of Finite Element Analysis would be required. Essentially FEA is about using computational analysis of structures (buildings, cars, aircraft etc.) to determine structural load capacities, characteristics of components during and post failure / impact as well as ability to refine design characteristics to improve performance (such as virtual wind tunnel testing).

Question 24

4 candidates attempted this question, and all 4 answers were of a high standard. The key requirement was necessary familiarity with the twelve principles of animation. These include "squash and stretch", "anticipation" "staging" "timing" "secondary action" etc.

Question 25

This question was well answered by the small number of candidates who answered it. Most candidates described the need to reduce the poly count in order to reduce memory usage. High level responses described using texture baking process to generate libraries of texture maps and the use of normal mapping techniques to fake lighting of bumps and dents to add detail to a scene without using more polygons.

Question 26

This question was answered by approximately a third of candidates. They described how interactive design enhanced and improved visual communication and was cost effective in the marketing phase. Good discussion around how the client/customer could interact with the design and choose when and where they may wish to go was a common response. Reference to the production of game-based assets was the basis for most responses as it broadly applies the same graphic optimization techniques as used in a game engine such as Unreal.

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