Computer Graphics and Design

Course Code: CGD315113

2013 Assessment Report

Overview

The Examination Paper accurately reflected the diversity of the syllabus, giving candidates ample opportunity to illustrate a body of knowledge in relation to both criteria, 2 and 7.

Generally, this style of Examination which has a combination of essay and short answer questions allows Candidates with varying levels of competence to have ample opportunity to answer questions from a wide choice of options/topic areas. Graphic communication skills are also paramount as the need to generate and communicate design ideas through concept drawings and storyboards etc. is naturally expected from students studying a design based subject. In general terms the level/standard of sketching which accompanied certain types of questions was not at a high a standard. The required standard of sketching was only seen in a low number of exams. The understanding of Orthographic projection was not illustrated well and in many instances a poor understanding was accompanied again by poor drawing skills.

Candidates working in a Pre-Tertiary Graphic Communication/Design based course would be expected to sketch at a high level incorporating orthographic and 3D perspective illustrations especially when dealing with object/product designs. Flowcharts, Sitemaps and in some cases storyboards etc are well suited to 2D techniques but the use of colour and shading techniques can enhance the communication of ideas across all sketching techniques more easily.

Within the project folios, many research/analysis essays continue to be a commentary on the process of producing the project, not an in depth study of an industry best relating to the candidates project. Very few candidates used correct referencing techniques. Maintaining academic integrity is paramount. It is recognised that some confusion may arise from the syllabus document as well as the Project Guidelines. Changes are being made to the Project Guidelines for 2014 to communicate the need for the essay to be researched based in an industry best relating to the project undertaken.

Some candidates are presenting content which is inappropriate both socially and ethically, these projects had little justification through a design brief, research or any form of academic rigor. As a consequence the student work was deemed inappropriate and not in keeping with the intentions of the course. When discussing project topics with students it is important they understand the context they are working and presenting in. In most cases they are minors working in an educational setting with mixed cultures and associated belief systems and when the work is presented for external marking the same applies; the students have no knowledge of the TQA assessors or their cultural and belief systems.

If a student is intent on producing questionable content then it must be a comprehensive presentation as any other design project should be illustrating context, understanding, purpose and reason otherwise it is a gratuitous pointless expression.

Many candidates struggled with formulating true and correct design briefs. Many examples where conceived after the project with no recognition of design requirements and limitations. Many design briefs had no context or meaning and where just a simple statement saying what it was they produced.
A design brief should include:

- a scenario, situation or context.
- a statement of intent or problem to solve
- requirements and limitations
- timeline/project management
- a evaluation after the project in terms of achieving the intended project and whether the terms of the brief where achieved.

Authenticity of projects and evidence of progress is easily illustrated with screen captures but mean very little when poorly sequenced and annotated. Candidates should endeavour to eliminate any reason for doubt in terms of authentic student work. This will be addressed in the project guidelines for 2014.

Game engine driven presentations must have a clear distinction of original assets and content with descriptions and proof of authenticity. Watermarked 3D content seem mostly in game engine driven presentations shows assets are taken from elsewhere, where no recognition is given these assets are being presented as student work which is unacceptable. Any content not generated by the student must be acknowledged correctly in the references or bibliography.

Design projects must reflect the standards and conventions used in closely related industry equivalent. That means architectural projects must reflect a true and accurate architectural process. Stop frame animation must be created with ‘stop frames’, not video with every second or third frame removed.

Websites must reflect industry standards and conventions.

Post production of animated sequences is important with good editing reflecting a well-designed computer graphic product. Opening single application files is not appealing so all candidates are encouraged to present digital content in a ‘presentation’ of some form. In complete projects do not fulfil assessment criteria and are not assessed favourably.

Written examination feedback on each question

Question 1

This question was attempted by the majority of students and was generally answered to a good standard. Typically students mentioned using a larger and / or second monitor. Stronger answers discussed graphics cards and other hardware set up considerations that would best facilitate the use of a second monitor. Quite a few students discussed running software that facilitated the use of a second desktop on the same machine. Weaker answers suggested running a second or third computer. (This wasn’t really what the question was seeking). Lower achieving students over simplified the issue by commenting that unwanted programs and files could be minimised.
Question 2

Not a popular question by candidates but mostly answered at a basic level. High end answers included comments along the lines of prototypes developed with digital fabrication (3d) and then presented to sample groups of target audience. The use of surveys in relation to personal behaviours, likes etc.

Analysing precedents and current market share holders/leaders.

Question 3

Students attempting this question were split into two broad groups. One group talked about using a variety of data storage devices such as flash drives and portable hard drives etc. This group really missed the second part of the question that related to accessibility from remote locations. Cloud storage was frequently mentioned as a solution to this issue. Many students also discussed various network options including the NBN. To achieve an “A” rating on this question, students needed to address both aspects of the question (storage and accessibility) and provide definitions and examples of the technology based solutions.

Question 4

This question wasn’t particularly popular but those students that attempted it generally achieved a reasonably good standard of answer. Lower quality answers were overly simplistic in suggesting things like “render it”. Higher quality answers interpreted the question as meaning that it was to still be viewed as a wire frame but the issue of visual ambiguity (ie. what is in front and what is behind) needed to be addressed. Better answers discussed the use of light and shadow effects. Some students discussed the application of a texture to the wire frame and thickening the polygons as well as the application of a graduated texture colour with the brighter colour nearest the camera and a more subdued shade behind.

Question 5

Generally well answered with most candidates indicating that the issue was based around a low poly count and the need to increase the iteration setting to overcome the issue. Some answers also included the subdivision of segments along with the applying a turbo smooth modifier to improve the smooth surface.

Question 6

A small number of candidates attempted this question. It was generally well answered with a good understanding of how large numbers of objects in a scene can slow down the operational efficiency of the production process. Many options for improving scene efficiency were described such as reducing or optimising the amount of polygons in each fence object, using textures to add extra levels of detail if a realistic scene environment is required and the use of instanced objects instead of copied objects to improve scene efficiency. A few high level answers also described the use of proxy objects as a way to efficiently optimise scene environments in such a situation as the question posed.
Question 7

Most students who answered this question offered a solution based on using 3D software such as 3D Studio Max, Bender and so on. Such answers, however, did not address how the sign would appear three-dimensional when viewed from the main camera. Many students, when seeing the words “three-dimensional” assumed a 3D software solution without recognising the need to address perspective and viewing angles. Only a small number of responses offered a combination of the use of 2D and 3D software to design a flat image in 2D and them explore perspective and viewing angles using 3D software.

Question 8

This question was attempted by a moderate number of students. Only a few scored "A" results on what should have been an easy question.

The primary reasons for achieving a lower result included:

(a) Not being able to distinguish Isometric from other forms of 3D drawing (ie using 30 degree axes). Many attempts were in some form of oblique or perspective.

(b) The accuracy of the drawing of the model based on 2 dimensional data provided was a problem for quite a few students. For example, many answers showed the r30 "scouped" radius with its lower edge at the very front of the block rather than inset by 20mm.

(c) A number of students overlooked the required description of how they would model the block.

Question 9

This proved to be a popular question. All students were able to distinguish the basic differences between Raster and Vector graphics, in terms of Pixel based versus Path based images. Some students were confused and revered the naming. Many students were able to offer examples of software appropriate for creating each image type with Photoshop and Illustrator being the most popular. More extensive responses from students were also able to give examples of file types appropriate to each image, eg .jpg .gif .ai and so on. Better responses also gave an indication of file sizes and a comparison between the Raster and Vector files.

Question 10

A popular question and again the high level answers included; High level rendering which accommodates raytracing and the use of refraction, reflection through lighting and the application of textures (eg environment maps as reflections). The use of ‘daylight’ systems which resemble actual lighting conditions outside the room with light entering through window openings and the interplay of light reflected off other surfaces in the room. Textural properties of the glass could be improved with bump maps in the instances of surface engraving etc. Surrounding items in the scene impact on the way glass items are portrayed.
Question 11

A real easy question for candidates who actually listed THREE different file types and explained each aspect of the question.....data size....image quality....and explained each. GIF or PNG (the most contemporary) explaining colour depth (number of colours) with bit count, eg 8 bit 256 colours as opposed to 24 bit 16.8 million colours, the preferred type based on content eg, logo verse photo. Lossless V Lossy compression methods. JPEG and the implications for over compressing a lossy format.

Question 12

Orthographic is the standard for building assessment as it enables the dimensioning of all elements within the drawing. A perspective view was the solution for a number of candidates as they incorrectly perceived that they would be able to pan around the model. The question clearly stated that the drawing would be printed.

Question 13

Students that attempted this question fell into two main camps. 1: Those who regarded Boolean subtraction as the only type of Boolean operation and 2: Those who had an appreciation of Boolean subtraction, intersection and union. The better answers provided clear definitions of the chosen two operations. These were subsequently backed up with relevant examples.

Question 14

This question was attempted by most candidates and done so to a high standard overall. As it is considered one of the key fundamental systems to understand when working within a digital environment, it was pleasing to see an overwhelming number of candidates understood the difference between RGB and CMYK colour systems. Most candidates also understood their specific applications, that is, for screen based and print based design outcomes respectively. Higher level answers also discussed the differences in the colour gamut (range) of the two systems and that the CMYK system has a smaller gamut, especially highly saturated reds, greens and blues, that can be compensated for by using spot colour layers with systems such as the Pantone colour system.

Question 15

Many candidates attempted this question with only basic replies, while USB and burnt discs are great personal options for a large computer graphics studio the following is more appropriate. Network attached storage devices running raid configured drives. Application and data servers locally (LAN) with synchronisation to external data centres (the cloud) (WAN). Version control software for managing client files. Backup synchronisation which runs while the business is out of hours. The design office uses a DBMS database management system for archival and retrieval of customer data.
Question 16

Each pixel contains RGB in round, rectangular or other shaped configurations. Values of 0-256 are used for intensity of each RGB value so a possible 16.7 million colours can be achieved. Most candidates who attempted this where OK.

Question 17

Good numbers of students attempted this question.

Most students were able to offer a sound storyboard plan. There was however a broad range in the quality of the storyboards that were drawn. Many students confused the issues of recycling and littering so that the key issue was often missed. The failings in the production of the storyboards was the lack of annotation, or explanation, for each, or any, of the panels drawn. This then failed to offer clarity to those who may have been involved in the production.

Many students missed the thrust of part (a) of this question. Rather than describe the process of producing the video many provided a commentary about the storyboard that had been included. Better students could not only describe the design process but also provided technical detail about capturing live video, sound and sound effects as well as post production work.

Question 18

This was a popular question amongst most candidates. Strong answers include well annotated sketches with strong evidence of the evolution of the logo concepts. Only a few candidates took into account the steps in the Design Process in order to detail their design considerations. A large number of candidates made little or no reference to the design principles and elements in there design solution. Many logo designs were either poorly thought through or overly complex.

Quite a few candidates also used coloured pencils or highlighter pens to enhance their final solutions

Question 19

Candidates who attempted this question generally provided good solid design solutions and understood that systems such as 3D printing would be a viable method of being able to rapidly produce and test design prototypes. A number of candidates provided sketches in both orthogonal and pictorial format which was pleasing to see. Unfortunately, some candidates did not set out their orthogonal concepts in an appropriate manner with views randomly scattered over the design pages. Applying appropriate standards and conventions is an important aspect of effective design development. It was also pleasing to see most candidates also produced annotations to support their design ideas. In some cases there were issues with candidates properly communicating and understanding ideas of appropriate scale and proportion in design which reduced their capacity for higher level outcomes. Higher level answers also illustrated and described how the use of a “tactile” surface on the game pieces could additionally assist people with vision impairment and that a design system that “locks” game pieces in place and protrude also assist players with vision impairment. Higher level answers also discussed how design testing is an integral aspect of design development and that development a final design solution to go to market in
this context would be an iterative process involving multiple cycles of design prototyping, testing and refinement.

**Question 20**

Not a very popular question but attempted by some. With any media project user interaction is paramount and useability of the interface regarded as most important. Content with multiple strands needs a web like interface which allows sequential guided navigation but at the same time offering the user the ability to move across strands of content.

The application of the design process model of execution is important with the use of prototypes and user testing.

Embedding online content into the DVD gives currency and life to such a product with the online and disc environment blending seamlessly.

A visual breadcrumb navigation structure is adviseable as seen in website design allowing the user to navigate backwards easily and helps build a conceptual mind map of the virtual spaces contained on the DVD.

**Question 21**

A Popular question attempted by most candidates answering this question well. Well answered questions included changes to processor speed, memory capacity, data storage, network capacity and the increase in the amount and speed of data coming out of optical fibre. Physical size of computers and hand held devices and there capacity was also very common response. The rise of the internet and the need to meet a growing demand for information was also discussed by a few candidates. Higher level answers around Software development discussed the stability, speed usability and its cost.

**Question 22**

This question was only attempted by a few candidates who were able to communicate the key role computer graphics plays in providing a visual representation of the GPS data in navigation systems and that vector based graphics systems are the cornerstone of navigation devices. Better answers also described that with advances in mobile technologies and solid state storage systems higher levels of visually rich representations of environments can be implemented into satellite based

**Question 23**

Only a small number of candidates attempted this question.

It was clear from the responses that many students did not understand the relationship between data and computer graphics and the opportunity that computer graphics offers in providing a visual representation. It was also apparent that the need to provide live data and a graphical representation of it was lost on many students.
The key concept for this question was about data visualisation through a graphical means and an explanation of this was missed by most candidates.

Question 24

This was by far the most popular essay question in Section D. The question was laid out in a way that clearly helped students to provide a well structured answer. The use of definitions, backed up by relevant examples along with structuring the essay in a way that addressed the key elements raised in the question generally provided at least an acceptable outcome. Most students had a good understanding about the principles of 3D printing and common applications of the technology. Many students focussed on the use of 3D printing technology to produce weapons. Only a few discussed the potential positive implications for domestic use such as being able to download and print simple replacement components for domestic appliances.
TASMANIAN QUALIFICATIONS AUTHORITY

CGD315113  Computer Graphics & Design

ASSESSMENT PANEL REPORT

Award Distribution

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Student Distribution (SA or better)

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