Course Outline

Title: COMPUTER GRAPHICS AND ANIMATION PROGRAMMING

Code: ITECH3205

Formerly: CP765

Faculty / Portfolio: Faculty of Science

Program Level:

	AQF Level of Program					
	5	6	7	8	9	10
Level						
Introductory						
Intermediate						
Advanced			✔			

Pre-requisites: (CP627 or CP871 or ITECH2100 or ITECH6100)

Co-requisites: Nil

Exclusions: (CP765)

Progress Units: 15

ASCED Code: 020115

Learning Outcomes:

Knowledge:

- **K1.** Describe and explain fundamental theoretical concepts relating to computer graphics, three dimensional geometry and rendering;
- **K2.** Discuss and explain how various advanced techniques for graphical representation and manipulation function;
- **K3.** Interpret the importance of performance considerations in relation to interactive graphical applications, including discussion of speed/quality/resource-size trade-offs;
- **K4.** Discuss the sequence of events which transforms a three dimensional vertex position into a two dimensional pixel position;
- **K5.** Describe the manners in which colours are represented in computer graphics, including
  computation of colour through lighting and shading models.

Skills:

- **S1.** Construct graphical applications to specification using features of a graphics library;
- **S2.** Apply input handling techniques to manipulate computer graphics;
- **S3.** Draw and animate graphical representations of data utilising a variety of graphical programming techniques;
- **S4.** Utilise the functionality of a variety of programming libraries.

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Application of knowledge and skills:

A1. Create interactive graphical applications which meet the provided project's design goals;

Values and Graduate Attributes:

Values:

V1. Recognise the legal and ethical issues that underpin responsible application development.

Graduate Attributes:

Attribute	Brief Description	Focus
Continuous Learning	Students are provided with complex techniques for manipulation and drawing of 3D geometry, but to use these techniques effectively they must invest time and effort to understanding their use and application outside of classes.	High
Self Reliance	Students are asked to create new applications using their existing knowledge in new situations, and although can be provided with assistance, the student themselves must rely on their own hard work and effort to achieve the assignment goals.	Medium
Engaged Citizenship	Confidently employ and adapt professional expertise regarding the application of 3D programming and animation to multiple sectors	Low
Social Responsibility	Analyse and examine issues of intellectual property, copyright law and censorship in regards to multimedia design and deployment.	Low

Content:

Topics may include:

- Mathematics for 3D graphics;
- Geometric transformations including 3D viewing and projections;
- Colour, shading and lighting models;
- Animation;
- User interaction;
- Techniques for hierarchical modelling;
- Surface mapping techniques;
- Visible-surface determination;
- The rendering pipeline;
- Graphics hardware.

Assessment:

Assessment for this course will be based on a number of tasks including lecture tests, assignments involving the display and animation of 3D graphics, and an end of semester examination covering theoretical aspects of the course.

Learning Outcomes Assessed	Assessment Task	Assessment Type	Weighting

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K1, K2, K3, K4, K5	Lab test & exam on theoretical aspects of 3D graphics, techniques and the graphical transformation pipeline.	Test(s) & examination(s)	40% - 60%
K3, K5, S1, S2, S3, S4, A1	Assignments involving the display and animation of 3D animated graphics.	Assignment(s)	40% - 60%

Adopted Reference Style:

APA

Presentation of Academic Work:

https://federation.edu.au/students/assistance-support-and-services/academic-support/general-guide-for-the-presentation-of-academic-work