

ELEC 2007 ENGINEERING VISUALIZATION

Credit Points 10

Legacy Code 300029

Coordinator Peter Lendrum ([https://directory.westernsydney.edu.au/search/name/Peter Lendrum/](https://directory.westernsydney.edu.au/search/name/Peter%20Lendrum/))

Description This subject aims to provide a comprehensive introduction to fundamental concepts and algorithms in engineering visualization. Topics covered include visualization hardware, scan conversion of geometric primitives, 2D and 3D transformations, 3D viewing and projection, hidden surface removal, solid modelling, illumination models and image manipulation.

School Eng, Design & Built Env

Discipline Electrical And Electronic Engineering And Technology

Student Contribution Band HECS Band 2 10cp

Check your HECS Band contribution amount via the Fees (https://www.westernsydney.edu.au/currentstudents/current_students/fees/) page.

Level Undergraduate Level 2 subject

Pre-requisite(s) Students must have passed ELEC 1006 Engineering Computing and either ELEC 2009 Microprocessor Systems or ELEC 2008 Microcontrollers and PLCs

Equivalent Subjects LGYB 0688 - Computer Graphics

Restrictions Students must have successfully completed 160 credit points.

Assumed Knowledge

C++ Programming and 3-D Geometry.

Learning Outcomes

On successful completion of this subject, students should be able to:

1. Analyse and select visualization hardware;
2. Draw 2D and 3D objects on a raster display device;
3. Perform affine transformations to 2D and 3D objects;
4. Model a 3D object, project it onto a view plane, and determine its visible surface;
5. Determine the shade of a visible surface
6. Manipulate image for visualization.

Subject Content

1. Visualisation hardware
2. Visualisation software
3. Scan converting primitives and clipping
4. Transformations
5. Curves and surfaces
6. 3D Viewing and visible surface determination
7. Image manipulation and storage
8. Solid modelling
9. Illumination and shading

Assessment

The following table summarises the standard assessment tasks for this subject. Please note this is a guide only. Assessment tasks are regularly updated, where there is a difference your Learning Guide takes precedence.

Type	Length	Percent	Threshold	Individual/Group Task
Practical	3,000 words	30	N	Individual
Intra-session Exam	1.5 hours	20	N	Individual
Final Exam	2 hours	50	N	Individual

Prescribed Texts

- Hearn, D & Baker, MP 2011, Computer graphics with OpenGL, Addison Wesley, Boston

Teaching Periods

Autumn (2022) Penrith (Kingswood)

Day

Subject Contact Jeffrey Zou ([https://directory.westernsydney.edu.au/search/name/Jeffrey Zou/](https://directory.westernsydney.edu.au/search/name/Jeffrey%20Zou/))

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC2007_22-AUT_KW_D#subjects)

Sydney City Campus - Term 2 (2022) Sydney City

Day

Subject Contact Peter Lendrum ([https://directory.westernsydney.edu.au/search/name/Peter Lendrum/](https://directory.westernsydney.edu.au/search/name/Peter%20Lendrum/))

View timetable (https://classregistration.westernsydney.edu.au/even/timetable/?subject_code=ELEC2007_22-SC2_SC_D#subjects)

Sydney City Campus - Term 1 (2023) Sydney City

On-site

Subject Contact Peter Lendrum ([https://directory.westernsydney.edu.au/search/name/Peter Lendrum/](https://directory.westernsydney.edu.au/search/name/Peter%20Lendrum/))

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC2007_23-SC1_SC_1#subjects)

Sydney City Campus - Term 3 (2023) Sydney City

On-site

Subject Contact Peter Lendrum ([https://directory.westernsydney.edu.au/search/name/Peter Lendrum/](https://directory.westernsydney.edu.au/search/name/Peter%20Lendrum/))

View timetable (https://classregistration.westernsydney.edu.au/odd/timetable/?subject_code=ELEC2007_23-SC3_SC_1#subjects)