The Hong Kong University of Science and Technology

UG Course Syllabus (Fall 2025-26)

Course Title: Computer Graphics

Course Code: COMP 4411

No. of Credits: 3-credit

[Any pre-/co-requisites]: *COMP 3711 OR COMP 3711H*

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Course Description

Display technologies; scan conversion; clipping; affine transformations; homogeneous coordinates and projection; viewing transformations; hidden surface removal; reflectance and shading models; ray tracing; spline curves and surfaces; hierarchical modeling; texture mapping; color models.

Intended Learning Outcomes (ILOs)

By the end of this course, students should be able to:

1. build an interactive impressionistic paint system, similar in spirit to Paul Haeberli's The Impressionist.
2. build a viewer in which to construct a hierarchical articulated model using OpenGL.

3. build a program to create photorealistic raytraced images, complete with computation of shadows, reflections, and transparent effects.
4. build an Animator which includes animation curves on geometry and allows creation a 3D animation of an articulated model.

In general, they can by the end of the course:

-1 analyze real-time and offline computer graphics.
-2 apply the mathematics used in computer graphics.
-3 identify basic modeling techniques, such as spline curves and surfaces and hierarchical modeling.
-4 illustrate the use of basic rendering techniques, such as viewing transformations and scan conversion for real-time rendering, as well as ray tracing for offline rendering.
-5 apply basic techniques to light, shade, and texture map models.

Assessment and Grading

This course will be assessed using criterion-referencing and grades will not be assigned using a curve. Detailed rubrics for each assignment are provided below, outlining the criteria used for evaluation.

Assessments:

Assessment Task	Contribution to Overall Course grade (%)	Due date
4 Computer Projects	60%	TBA*
Homeworks	1%	TBA*
End-Term Examination	39%	TBA

* Assessment marks for individual assessed tasks will be released within two weeks of the due date.

TBA* -- available in the course web.

Mapping of Course ILOs to Assessment Tasks

Assessed Task	Mapped ILOs	Explanation
Assessed Task 1, 2, 3	ILO1, ILO2, ILO3. ILO4	The tasks assess students' ability to explain and apply concepts (ILO1, 2, 3, 4) and evaluate their applications (ILO1, 2, 3, 4).

Grading Rubrics

Homework is not graded. End-term examination has a solution/key to grade against. Four programming projects have their point-by-point grading scheme in the course web.

Final Grade Descriptors:

N/A

Course AI Policy

NO AI tools are allowed.

Communication and Feedback

Assessment marks for individual assessed tasks will be communicated via Canvas within two weeks of submission. Feedback on assignments will include specific details, e.g., strengths, areas for improvement. Students who have further questions about the feedback including marks should consult the instructor within five working days after the feedback is received.

Resubmission Policy

N/A

Required Texts and Materials

Recommended text

Foley, van Dam, Feiner, Hughes. Computer Graphics Principles and Practice,
Third Edition in C. Addison Wesley, 1996.

Academic Integrity

Students are expected to adhere to the university's academic integrity policy. Students are expected to uphold HKUST's Academic Honor Code and to maintain the highest standards of academic integrity. The University has zero tolerance of academic misconduct. Please refer to Academic Integrity | HKUST – Academic Registry for the University's definition of plagiarism and ways to avoid cheating and plagiarism.

Additional Resources

Online course content to be published in HKUST canvas when the semester begins.

Supplemental texts

Hearn, Baker. Computer Graphics: C Version Second Edition. Prentice Hall, 1997.
Alan Watt, 3D Computer Graphics, Third Edition, Addison-Wesley, 2000.
Woo, Neider, Davis, and Schreiner. OpenGL Programming Guide, Third Edition. Addison-Wesley, 1999.
Andrew S. Glassner. An Introduction to Ray Tracing. Academic Press, 1989.
Edward Angel, Interactive Computer Graphics: A top-down approach with
OpenGL, Second Edition. Addison Wesley, 2000.