School of
Engineering and Computer Science
Te Kura Mātai Pūkaha, Pūrorohiko

Prescription

This course introduces the algorithmic and mathematical foundations of three-dimensional modelling. Topics include representations such as polygons, splines, implicit surfaces, point models, particle systems and volumetric models; concepts such as parameterisation, curvature and discrete differential geometry; algorithmic approaches such as gradient domain processing, spectral processing and example-based deformation. It does not address content creation.

Course learning objectives

Students who pass this course should be able to:

1. understand the characteristics and trade-offs of various geometric representations. (BE 3(a); BSc COMP 4);
2. program simple modelling operations using a common graphics framework such as Maya.(BE 3(a), 3(b), 3(f); BSc COMP 1, 2, 3, 4).
3. understand several general approaches to geometry processing including some familiarity with underlying mathematical concepts. (BE 3(a); BSc COMP 4);

Course content

2022: The course is primarily offered in-person, and there are components such as tests, labs, tutorials, and marking sessions which require in-person attendance. There will be remote alternatives for all the components of the course, but these are only available to students studying from outside the Wellington region. The remote option for tests will use a Zoom-based system for online supervision of the tests.

Students taking this course remotely must have access to a computer with camera and microphone and a reliable high speed internet connection that will support real-time video plus audio connections and screen sharing. Students must be able to use Zoom; other communication applications may also be used. A mobile phone connection only is not considered sufficient. The computer must be adequate to support the programming required by the course: almost any modern windows, macintosh, or unix laptop or desktop computer will be sufficient, but an Android or IOS tablet will not.

Withdrawal from Course

Withdrawal dates and process:
https://www.wgtn.ac.nz/students/study/course-additions-withdrawals

Lecturers

Zohar Levi (Coordinator)

zohar.levi@vuw.ac.nz 04 886 5330

CO 338 Cotton Building (All Blocks), Gate 7, Kelburn Parade, Kelburn

Teaching Format

This course will be offered in-person and online. For students in Wellington, there will be a combination of in-person components and web/internet based resources. It will also be possible to take the course entirely online for those who cannot attend on campus, with all the components provided in-person also made available online.

Weekly lectures, with students undertaking significant project work.

Student feedback

Student feedback on University courses may be found at:
www.cad.vuw.ac.nz/feedback/feedback_display.php

Dates (trimester, teaching & break dates)

- Teaching: 28 February 2022 - 03 June 2022
- Break: 11 April 2022 - 24 April 2022
- Study period: 06 June 2022 - 09 June 2022
- Exam period: 10 June 2022 - 25 June 2022

Class Times and Room Numbers

28 February 2022 - 10 April 2022

- **Wednesday** 11:00 - 12:50 – 201, 83 Fairlie Tce, Kelburn

25 April 2022 - 05 June 2022

- **Wednesday** 11:00 - 12:50 – 201, 83 Fairlie Tce, Kelburn

Set Texts and Recommended Readings

Required

There are no required texts for this offering.

Mandatory Course Requirements

In addition to achieving an overall pass mark of at least 50%, students must:

- Both the practical work and an understanding of the concepts and principles of modelling are essential to the course. Therefore, all the course tasks are mandatory.

If you believe that exceptional circumstances may prevent you from meeting the mandatory course requirements, contact the Course Coordinator for advice as soon as possible.

Assessment

The course is assessed through assignments and a project that involves presentation.

Assessment Item	Due Date or Test Date	CLO(s)	Percentage
Assignment 1		CLO: 1,2,3	10%
Assignment 2		CLO: 1,2,3	20%
Assignment 3		CLO: 1,2,3	30%
Project		CLO: 1,2,3	40%

Penalties

Assessment items submitted late receive a 25% penalty for each day late.

Extensions

Individual extensions will only be granted in exceptional personal circumstances, and should be negotiated with the course coordinator before the deadline whenever possible. Documentation (eg, medical certificate) may be required.

Submission & Return

All work should be submitted through the ECS submission system, accessible through the course web pages. Marks and comments will be returned through the ECS marking system, also available through the course web pages.

Workload

In order to maintain satisfactory progress in CGRA 409, you should plan to spend an average of 10 hours per week on this paper.

Teaching Plan

See https://ecs.wgtn.ac.nz/Courses/CGRA409_2022T1/LectureSchedule

Communication of Additional Information

All online material for this course can be accessed at https://ecs.wgtn.ac.nz/Courses/CGRA409_2022T1/

Links to General Course Information

- Academic Integrity and Plagiarism: https://www.wgtn.ac.nz/students/study/exams/integrity-plagiarism
- Academic Progress: https://www.wgtn.ac.nz/students/study/progress/academic-progess (including restrictions and non-engagement)
- Dates and deadlines: https://www.wgtn.ac.nz/students/study/dates
- Grades: https://www.wgtn.ac.nz/students/study/progress/grades
- Special passes: Refer to the Assessment Handbook, at https://www.wgtn.ac.nz/documents/policy/staff-policy/assessment-handbook.pdf

- Statutes and policies, e.g. Student Conduct Statute: https://www.wgtn.ac.nz/about/governance/strategy
- Student support: https://www.wgtn.ac.nz/students/support
- Students with disabilities: https://www.wgtn.ac.nz/st_services/disability/
- Student Charter: https://www.wgtn.ac.nz/learning-teaching/learning-partnerships/student-charter
- Terms and Conditions: https://www.wgtn.ac.nz/study/apply-enrol/terms-conditions/student-contract
- Turnitin: http://www.cad.vuw.ac.nz/wiki/index.php/Turnitin
- University structure: https://www.wgtn.ac.nz/about/governance/structure
- VUWSA: http://www.vuwsa.org.nz

Offering CRN: 28328

Points: 15
Prerequisites: CGRA 350 or COMP 308 or at least B- in CGRA 401 and 402 (or COMP 471 and 472 in 2014-15);
Restrictions: COMP 409
Duration: 28 February 2022 - 26 June 2022
Starts: Trimester 1
Campus: Kelburn