

# Introduction to Computer Graphics - Course Outline

## CGRA 151: 2016 Trimester 2

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This document sets out the workload and assessment requirements for CGRA 151. It also provides contact information for staff involved in the course. If the contents of this document are altered during the course, you will be advised of the change by an announcement in lectures and/or on the course web site. A printed copy of this document is held in the School Office.

## Course Content

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The course has three components:

1. **Programming:** to teach you how to use a Java-like graphics language, Processing, to consolidate what you learnt in COMP102, COMP112 or DSDN142, to teach you something about algorithm design, especially about ways to optimise an algorithm.
2. **Behind the scenes:** Detailed consideration of a range of computer graphics algorithms, so that, for example, you know what is going on when you tell a computer to draw a line, render a triangle mesh, or run a game.
3. **Fundamental concepts** in human vision, colour representation and display design: so that you know the limitations of what we do and why those limitations exist.

## Objectives

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

1. Write simple programs in the Processing programming language.
2. Understand, be able to explain and reproduce a range of fundamental computer graphics algorithms, including line drawing, triangle drawing, clipping, and curve drawing.
3. Understand and use the vector and matrix representations in 2D and 3D homogenous co-ordinate systems, to perform transformations and projection.
4. Understand and be able to explain the basics of image processing, including filtering, point processing, compositing, half toning, dithering and error diffusion.
5. Understand and explain the human visual system, its limitations, and the implications these limitations have on representations of colour, display resolution, and quantisation. Describe a number of colour spaces and their relative merits. Explain the basics of the key display technologies in current use.

## Text books

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[Fundamentals of computer graphics](#) (eBook) - Peter Shirley, Steve Marschner - A K Peters, Third Edition, 2009

[Getting started with Processing](#) (eBook) - Casey Reas, Ben Fry, - Maker Media, Second Edition, 2015

The list of books, with links to the online versions of the eBooks, can be found on [Talis](#) or via [Blackboard](#).

You do not need to buy any text books for CGRA 151 because the University provides eBook versions of the two principal text books.

## Lectures, Laboratories, and Practical work

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CGRA 151 runs in Trimester 2 in 2016. Trimester 2 lectures start on 13 July 2016 and end on 14 October 2016. The mid-trimester break is 22 August - 4 September 2016. The study/examination period is 21 October - 12 November.

### Lectures

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Lectures for CGRA 151 are Monday, Wednesday, Friday in Maclaurin MCLT101 at 13:10.

A [schedule](#) of lecture topics and slides covered in each lecture is available online

### Laboratories and Marking Sessions

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Laboratories (weeks 1, 3, 5, 7, 10, 11) and marking sessions (weeks 2, 4, 6, 8, 9, 12) all take place in [CO242](#).

You must sign up for one session and attend that session every week.

You must sign up for a session using [Student Allocator](#) before Tuesday 12 July.

Sessions are identified by colour names.

	Monday	Tuesday	Wednesday	Thursday	Friday
10			Red	Green	Blue
11			Orange	Cyan	Indigo
12					
13	lecture		lecture		lecture
14			Yellow		Violet
15				Magenta	
16				Purple	

The material to be covered in each session is:

1. **Lab** working through Worksheet 1, preparation for Assignment 1
2. **Marking** assignment 1; working through Worksheet 2
3. **Lab**: you will already have completed the core of Assignment 2, bring your questions and work on the rest of Assignment 2
4. **Marking** assignment 2; working through Worksheet 3
5. **Lab**: you will already have completed the core of Assignment 3, bring your questions and work on the rest of Assignment 3
6. **Marking** assignment 3
7. **Lab**: support and help with Assignment 4
8. **Marking** assignment 4
9. **Marking**: assessment of your plan for assignment 5
10. **Lab**: tutors available to help with problems on assignment 5
11. **Lab**: tutors available to help with problems on assignment 5
12. **Marking** assignment 5

In **Lab** sessions, you will work through worksheets or on your assignments with tutors available to help with problems. You are strongly advised to attend Lab sessions.

In **Marking** sessions, a tutor will spend 10 to 15 minutes going over your submission with you. You are required to attend Marking sessions. In the rest of the session, you can work on your next worksheet or assignment.

## Assignments

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There are five assignments, designed to achieve Objective 1. Assignment handouts, due dates, marking times, and submission information can be found online on the course's [Assignments](#) page.

## Workload

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In order to maintain satisfactory progress in CGRA 151, you should plan to spend an average of at least 10 hours per week on this paper. A plausible and approximate breakdown for these hours would be:

- Lectures, laboratories, and marking sessions: 4 hours per week
- Consolidating lectured material, through readings, exercises, worksheets: 3 hours per week
- Assignments: 3 hours per week

## School of Engineering and Computer Science

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The School office is located on level three of the Cotton Building ([Cotton 358](#)).

The notice board for CGRA 151 is located on the second floor of the Cotton Building.

## Staff

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The course organiser for CGRA 151 is Prof. Neil Dodgson. Prof. Dodgson lectures the entire course. His contact details are:

- [Prof Neil Dodgson](#)
- [Cotton 329](#)
- +64 4 463 6922
- [Neil.Dodgson@vuw.ac.nz](mailto:Neil.Dodgson@vuw.ac.nz)

## Announcements and Communication

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The main means of communication outside of lectures will be the CGRA 151 web area at [http://ecs.victoria.ac.nz/Courses/CGRA151\\_2016T2/](http://ecs.victoria.ac.nz/Courses/CGRA151_2016T2/). There you will find, among other things, this document, the [lecture schedule](#) and [assignment handouts](#), and the [CGRA 151 Forum](#). The forum is a web-based bulletin board system. Questions and comments can be posted to the forum, and staff will read these posts and frequently respond to them.

## Assessment

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Your grade for CGRA 151 will be determined based on the following assessment weightings:

Item	Weight
Assignments 1-4	20%
Assignment 5	10%
Terms test	10%
Final Examination	60%

## Tests and Exams

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The terms test will be at the normal lecture time on Wednesday 17 August. The terms test will be held in the normal lecture theatre. The terms test will be 45 minutes long. No computers, electronic calculators or similar device will be allowed in the terms test. Paper non-English to English dictionaries will be permitted.

The [timetable for final examinations](#) will be available from the University web site and will be posted on a notice board outside the faculty office. The final examination will be 2 hours long. No computers, electronic calculators or similar device will be allowed in the final examination. Paper non-English to English dictionaries will be permitted. The examination period for trimester 2 is 21 October - 12 November.

## Practical Work

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All assignments in this course are marked in person during your usual Lab session. Failure to hand in your assignment by the deadline will result in a 10% penalty and failure to turn up and get your assignment marked during the correct Lab session will result in a 10% penalty, unless prior arrangements are made with the course coordinator. If you fail to get a submitted assignment marked by the end of the course you will get 0% for that assignment.

## Plagiarism

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### Working Together and Plagiarism

We encourage you to discuss the principles of the course and assignments with other students, to help and seek help with programming details, problems involving the lab machines. However, any work you hand in must be your own work.

The [School policy on Plagiarism](#) (claiming other people's work as your own) is available from the course home page. Please read it. We will penalise anyone we find plagiarising, whether from students currently doing the course, or from other sources. Students who knowingly allow other students to copy their work may also be penalised. If you have had help from someone else (other than a tutor), it is always safe to state the help that you got. For example, if you had help from someone else in writing a component of your code, it is not plagiarism as long as you state (eg, as a comment in the code) who helped you in writing the method.

## Mandatory Course Requirements

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1. Achieve at least 40% on the final examination
2. Achieve at least 40% across the assignments

Any student who is concerned that they have been (or might be) unable to meet any of the mandatory course requirements because of exceptional personal circumstances, should contact the course coordinator as soon as possible.

## Passing CGRA 151

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To pass CGRA 151, a student must satisfy mandatory requirements and gain at least a **C-** grade overall.

## Withdrawal

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The last date for withdrawal from CGRA 151 with entitlement to a refund of tuition fees is Friday 22 July 2016. The last date for withdrawal without being regarded as having failed the course is Friday 23 September 2016 -- though later withdrawals may be approved by the Dean in special circumstances.

## Rules & Policies

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Find key dates, explanations of grades and other useful information at <http://www.victoria.ac.nz/home/study>.

Find out about academic progress and restricted enrolment at <http://www.victoria.ac.nz/home/study/academic-progress>.

The University's statutes and policies are available at <http://www.victoria.ac.nz/home/about/policy>, except qualification statutes, which are available via the Calendar webpage at <http://www.victoria.ac.nz/home/study/calendar> (See Section C).

Further information about the University's academic processes can be found on the website of the Assistant Vice-Chancellor (Academic) at <http://www.victoria.ac.nz/home/about/avcacademic>

All students are expected to be familiar with the following regulations and policies, which are available from the school web site:

[Grievances](#)

[Student and Staff Conduct](#)

[Meeting the Needs of Students with Disabilities](#)

[Student Support](#)

[Academic Integrity and Plagiarism](#)

[Dates and Deadlines including Withdrawal dates](#)

[School Laboratory Hours and Rules](#)

[Printing Allocations](#)

[Expectations of Students in ECS courses](#)

The School of Engineering and Computer Science strives to anticipate all problems associated with its courses, laboratories and equipment. We hope you will find that your courses meet your expectations of a quality learning experience.

If you think we have overlooked something or would like to make a suggestion feel free to talk to your course organiser or lecturer.

[Course Outline as PDF](#)

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