



**MONASH** University  
Information Technology

**FIT1033**  
**Foundations of 3D**

**Unit Guide**

**Semester 2, 2011**

The information contained in this unit guide is correct at time of publication. The University has the right to change any of the elements contained in this document at any time.

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# Table of Contents

<b><u>FIT1033 Foundations of 3D - Semester 2, 2011</u></b> .....	<b>1</b>
<u>Mode of Delivery</u> .....	1
<u>Contact Hours</u> .....	1
<u>Workload</u> .....	1
<u>Unit Relationships</u> .....	1
<u>Prohibitions</u> .....	1
<u>Chief Examiner</u> .....	1
<u>Campus Lecturer</u> .....	1
<u>Berwick</u> .....	1
<u>Caulfield</u> .....	2
<u>Tutors</u> .....	2
<u>Berwick</u> .....	2
<u>Caulfield</u> .....	2
<b><u>Academic Overview</u></b> .....	<b>3</b>
<u>Learning Objectives</u> .....	3
<u>Graduate Attributes</u> .....	3
<u>Assessment Summary</u> .....	3
<u>Teaching Approach</u> .....	4
<u>Feedback</u> .....	4
<u>Our feedback to You</u> .....	4
<u>Your feedback to Us</u> .....	4
<u>Previous Student Evaluations of this unit</u> .....	4
<u>Recommended Resources</u> .....	4
<u>Additional subject costs</u> .....	4
<b><u>Unit Schedule</u></b> .....	<b>6</b>
<b><u>Assessment Requirements</u></b> .....	<b>7</b>
<u>Assessment Tasks</u> .....	7
<u>Participation</u> .....	7
<u>Examinations</u> .....	9
<u>Assignment submission</u> .....	9
<u>Extensions and penalties</u> .....	9
<u>Returning assignments</u> .....	10
<u>Referencing requirements</u> .....	10
<b><u>Other Information</u></b> .....	<b>11</b>
<u>Policies</u> .....	11
<u>Student services</u> .....	11

# **FIT1033 Foundations of 3D - Semester 2, 2011**

This unit is an introduction to the techniques, frameworks and processes comprising 3D modelling and 3D imaging. Foundations of 3D aims to give students an understanding of 3D modelling by developing skills in 3D model creation for a variety of contexts, including 3D prototyping, 3D visualisation and 3D modelling for games and animation. Students will communicate their knowledge of 3D theory through the production of designs that demonstrate geometrical modelling, texture mapping, virtual lighting techniques, camera positioning, and rendering procedures.

## **Mode of Delivery**

- Berwick (Day)
- Caulfield (Day)

## **Contact Hours**

2 hrs lectures/wk, 2 hrs tutorials/wk

## **Workload**

Students will be expected to spend a total of 12 hours per week during semester on this unit as follows:

Lectures: 2 hours per week

Tutorials/Lab Sessions: 2 hours per week per tutorial

and up to an additional 8 hours in some weeks for completing lab and project work, private study and revision.

## **Unit Relationships**

### **Prohibitions**

FIT2015, DIS1911

### **Chief Examiner**

Mr Tom Chandler

### **Campus Lecturer**

### **Berwick**

Tom Chandler

## **Caulfield**

**Tom Chandler**

## **Tutors**

### **Berwick**

**Michael Lim**

**Tom Chandler**

### **Caulfield**

**Michael Lim**

**Nori Tominaga**

**Brent McKee**

**Tom Chandler**

# Academic Overview

## Learning Objectives

At the completion of this unit students will have:

- A demonstrated understanding of the different applications of 3D design over a range of digital media;
- an appreciation of the commercial imperatives of the 3D working environment;
- an understanding of the simulated spatial environment and taxonomy of the 3D discipline;
- a practical understanding of the issues involved in the 3D development process;
- an appreciation of 3D modelling and 3D imaging as a unique medium in the context of digital graphic creation;
- developed the skills to design, create and detail 3D models and scenes for various outputs;
- the ability to evaluate and assess techniques used in the 3D creation process;
- developed the skills to manage and implement efficient 3D modelling production workflows.

## Graduate Attributes

Monash prepares its graduates to be:

1. responsible and effective global citizens who:

- a. engage in an internationalised world
- b. exhibit cross-cultural competence
- c. demonstrate ethical values

critical and creative scholars who:

- a. produce innovative solutions to problems
- b. apply research skills to a range of challenges
- c. communicate perceptively and effectively

## Assessment Summary

In-semester assessment: 100% (includes 30% in-class/tutorial tests)

<b>Assessment Task</b>	<b>Value</b>	<b>Due Date</b>
Assignment 1	20%	Week 4
Assignment 2	20%	Week 8
Assignment 3	30%	Week 14
Tutorial Tests	Weighting: 30% (3 x 10%)	Weeks 5, 9, 12

## Teaching Approach

### Lecture and tutorials or problem classes

This teaching and learning approach provides facilitated learning, practical exploration and peer learning.

## Feedback

### Our feedback to You

Types of feedback you can expect to receive in this unit are:

- Informal feedback on progress in labs/tutes
- Graded assignments with comments
- Test results and feedback

### Your feedback to Us

Monash is committed to excellence in education and regularly seeks feedback from students, employers and staff. One of the key formal ways students have to provide feedback is through SETU, Student Evaluation of Teacher and Unit. The University's student evaluation policy requires that every unit is evaluated each year. Students are strongly encouraged to complete the surveys. The feedback is anonymous and provides the Faculty with evidence of aspects that students are satisfied and areas for improvement.

For more information on Monash's educational strategy, and on student evaluations, see:

<http://www.monash.edu.au/about/monash-directions/directions.html>

<http://www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html>

## Previous Student Evaluations of this unit

If you wish to view how previous students rated this unit, please go to

<https://emuapps.monash.edu.au/unitevaluations/index.jsp>

## Recommended Resources

Autodesk® Maya® 2011 software will be provided on campus lab computers, and students are encouraged to register with the Autodesk Education Community (<http://students.autodesk.com/>) for their own educational trial version of Autodesk® Maya® 2011 and related Autodesk software under the company's terms and conditions.

Please also see *Recommended Texts* in 'Other Information'

## Additional subject costs

Assignment 1 requires students to source a small object that they can bring to tutorials to model in 3D. Getting the right object is tricky: some objects will be too easy to model and others are too complex.

While sometimes students can source suitable objects at home, a lot of interesting objects can be found very cheaply at second hand stores, trash and treasure fairs and opportunity shops.

Assignment 2 requires students to take digital photos of textures (walls/carpets/skies etc.) and edit them

## Academic Overview

for inclusion in their model. Though digital cameras would offer more options and better quality images , most mobile phones would probably be sufficient for this exercise as the photos do not have to be high resolution,

Assignment 3 requires students to create and model a character for a fictional computer game. Before modelling their character with 3D software, students will be required to prototype their character with modelling plasticine. This material costs approximately \$10 and is available from the campus bookshops at Berwick and Caulfield.

## Unit Schedule

Week	Activities	Assessment
0	No Lecture	No Tutorial
1	Introduction to Unit and 3D Theory and Maya Interface	
2	Introduction to Polygon modelling, Basic Cameras and Rendering	Bring a 3D Object to tutorial - Check
3	Polygon Deformation Tools and Polygon Modelling Techniques	
4	Introduction to 3D Lighting Theory and 3D Composition	Assignment 1 Due week 4
5	Introduction to 3D Texturing and Image Editing	Tutorial Test 1: 3D Modelling week 5
6	3D Texturing Techniques	
7	3D Lighting Techniques, Scene Composition and 3D Cameras	Bring in Photographic Textures to tutorial - Check
8	Introduction to UV Texturing	Assignment 2 Due week 8
9	Introduction to Character Design and Character Modelling	Tutorial Test 2 : 3D Texturing week 9
10	Modelling 3D Characters Techniques	
11	Modelling and Texturing 3D Characters	Bring in plasticine character model Prototype to tutorial - Check
12	Character UV Texturing	Tutorial Test 3: Basic 3D Character Creation week 12; Assignment 3 is Due in week 14
	SWOT VAC	No formal assessment is undertaken in SWOT VAC
	Examination period	LINK to Assessment Policy: <a href="http://policy.monash.edu.au/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html">http://policy.monash.edu.au/policy-bank/academic/education/assessment/assessment-in-coursework-policy.html</a>

\*Unit Schedule details will be maintained and communicated to you via your MUSO (Blackboard or Moodle) learning system.



# Assessment Requirements

## Assessment Tasks

### Participation

#### • Assessment task 1

**Title:**

Assignment 1

**Description:**

Students are to source a real object (as opposed to just an image of an object) which they can bring into class and recreate in digital 3D space. The modelling technique(s) used will be based upon tutorial exercise work, though students are welcome to implement additional techniques that they have researched in their own time.

Selecting your object is important; it should be portable and small so you can easily turn it around to study its geometry. For example, if you choose to model a car, you would be referencing your geometry from a plastic or metal model car (like one of the 'matchbox' series), and not photographs of a full size vehicle. While some objects will be too complex, others can be too simple, so students will need to negotiate their ideas/models with their tutors at least two weeks prior to submission. Students are encouraged to look further afield than the object that they may be merely carrying on their person: mobile phones and sets of keys are hardly original modelling candidates. Miscellaneous trinkets, souvenirs, children's toys, collectables, opportunity shops and trash and treasure stalls are all recommended sources for locating the right object to model.

**Weighting:**

20%

**Criteria for assessment:**

- ◆ Modelling effectiveness and efficient geometry
- ◆ Basic lighting and colouring of subject/objects
- ◆ Presentation, composition and visual impact of rendered scene
- ◆ Accompanying project documentation, working files and reference images

**Due date:**

Week 4

#### • Assessment task 2

**Title:**

Assignment 2

**Description:**

This assignment involves the 3D creation of an interior or exterior architectural environment which is coloured (textured), lit with 3D lighting scheme and rendered. While the 3D modelling of your scene may or may not draw from real world references, your textures must be derive from your own photographic images. Using a digital camera, you must capture and edit digital images and integrate these into your modelled scene. Your preparation and editing of textures forms an important part of your documentation.

Your architectural scene can be inside or outside and your scene choice must be negotiated with your tutor at least a week prior to submission. An interior scene entails not only modelling and detailing an enclosed space but also considering the light from

## Assessment Requirements

lamps/windows/candlelight and shadows within it. Choosing an exterior scene means considering not only sunlight or moonlight but also the environmental surroundings of your architectural visualisation.

### Weighting:

20%

### Criteria for assessment:

- ◆ Modelling technique and quality of geometry
- ◆ Lighting and texturing techniques
- ◆ Presentation and visual impact of renders
- ◆ Documentation; working files, reference images and annotated
- ◆ screenshots of image editing and modelling process

### Due date:

Week 8

## • Assessment task 3

### Title:

Assignment 3

### Description:

In this assignment students will be creating an original 3D character first with modelling plasticine and then using this model as a primary reference to create a 3D character with Maya software. The practice of prototyping a plasticine models or maquettes has a long history in the animation discipline, and for the purposes of this final assignment, your plasticine prototype should assist in testing your initial ideas, setting a limit the complexity of your character, and ensuring originality. Finally, such prototyping serves to bring out fundamental similarities in, and differences between, the procedures of polygonal modelling and clay modelling. This plasticine prototype model forms part of the assessment of your final assignment and needs to be included as reference imagery (modelling/lighting/basic texturing) in your documentation.

As your character concept is hypothetically targeted for a computer game environment, and because further levels of detail are easier to add than subtract, your final Maya character has **a limit of 10,000 polygons** and needs to be **modelled as a single mesh**. You are encouraged to research your creation with a range of references as your character should be an original one and not simply a copy of a character from an existing game, animation or movie. Your Maya character should include basic colouring and texturing: character UV texturing is encouraged but is not mandatory. Because this assignment concerns the creation and detailing of a character no environment or background is required.

### Weighting:

30%

### Criteria for assessment:

- ◆ Modelling technique and quality of geometry
- ◆ Texturing techniques and character colouring (UV texturing is optional)
- ◆ The presentation and visual impact of your rendered character
- ◆ Documentation: character explanatory brief, working files, character prototype reference images

### Due date:

Week 14

• **Assessment task 4**

**Title:**

Tutorial Tests

**Description:**

There will be three tutorial tests during semester. These tests will be carried out within the Maya editing environment and will cover themes that are closely related to each of the three assignments.

**Weighting:**

Weighting: 30% (3 x 10%)

**Criteria for assessment:**

***Tutorial Test 1: 3D Modelling***

**Outline:** Students will be required to model and render several objects supplied by their tutors and produce renders with basic colours and lighting

**Grading Criteria:** Modelling Procedures, Scene Lighting, Colouring and Rendering

***Tutorial Test 2: 3D Texturing and Lighting***

**Outline:** Students will be required to texture and light a simple 3D environment with a limited

number of textures (jpegs) supplied by their tutors

**Grading Criteria:** Image Editing and Texturing Techniques, Rendering and Lighting

***Tutorial Test 3: Basic 3D Character Creation***

**Outline:** Students will be required to model a basic 3D character. Please note that in contrast to the previous tests, this third tutorial test takes place in week 12, **before the final assignment submission** in week 14

**Grading Criteria:** 3D Modelling Technique, Rendering, Colouring and Composition

**Due date:**

Weeks 5, 9, 12

## Examinations

### Assignment submission

It is a University requirement

(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-procedures.html>) for students to submit an assignment coversheet for each assessment item. Faculty Assignment coversheets can be found at <http://www.infotech.monash.edu.au/resources/student/forms/>. Please check with your Lecturer on the submission method for your assignment coversheet (e.g. attach a file to the online assignment submission, hand-in a hard copy, or use an online quiz).

### Extensions and penalties

Submission must be made by the due date otherwise penalties will be enforced.

You must negotiate any extensions formally with your campus unit leader via the in-semester special consideration process:

<http://www.infotech.monash.edu.au/resources/student/equity/special-consideration.html>.

## **Returning assignments**

Students can expect assignments to be returned within two weeks of the submission date or after receipt, whichever is later

## **Referencing requirements**

In the course of researching their assignments, students are encouraged to reference online resources related to the 3D modelling and animation discipline in their assignment documentation. When including images or text references in their documentation, students should cite the url and author (if applicable) and the date when the page was accessed.

## Other Information

### Policies

Monash has educational policies, procedures and guidelines, which are designed to ensure that staff and students are aware of the University's academic standards, and to provide advice on how they might uphold them. You can find Monash's Education Policies at:

<http://policy.monash.edu.au/policy-bank/academic/education/index.html>

Key educational policies include:

- Plagiarism  
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/plagiarism-policy.html>)
- Assessment  
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/assessment-in-coursework-p>)
- Special Consideration  
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.h>)
- Grading Scale  
(<http://www.policy.monash.edu/policy-bank/academic/education/assessment/grading-scale-policy.html>)
- Discipline: Student Policy  
(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-discipline-policy.html>)
- Academic Calendar and Semesters (<http://www.monash.edu.au/students/key-dates/>);
- Orientation and Transition (<http://www.infotech.monash.edu.au/resources/student/orientation/>);  
and
- Academic and Administrative Complaints and Grievances Policy  
(<http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy>)
- Codes of Practice for Teaching and Learning  
(<http://www.policy.monash.edu.au/policy-bank/academic/education/conduct/suppdocs/code-of-practice-tea>)

### Student services

The University provides many different kinds of support services for you. Contact your tutor if you need advice and see the range of services available at [www.monash.edu.au/students](http://www.monash.edu.au/students). The Monash University Library provides a range of services and resources that enable you to save time and be more effective in your learning and research. Go to <http://www.lib.monash.edu.au> or the library tab in my.monash portal for more information. Students who have a disability or medical condition are welcome to contact the Disability Liaison Unit to discuss academic support services. Disability Liaison Officers (DLOs) visit all Victorian campuses on a regular basis

- Website: <http://adm.monash.edu/sss/equity-diversity/disability-liaison/index.html>;
- Telephone: 03 9905 5704 to book an appointment with a DLO;
- Email: [dlu@monash.edu](mailto:dlu@monash.edu)
- Drop In: Equity and Diversity Centre, Level 1 Gallery Building (Building 55), Monash University, Clayton Campus.

### READING LIST:

#### Recommended Texts:

The following titles are available on reserve or through a short term loan through the Monash library. Please note that though these mainly general references. There is also a considerable collection of books and DVD's for specific 3D studies (creating characters, architecture, lighting and texturing) at both

## Other Information

the Monash Caulfield and Monash Berwick libraries.

Introducing Maya 2011 / Dariush Derakhshani, Wiley Pub. 2010

The Art of 3-D : Computer Animation and Imaging / Isaac Victor Kerlow (various editions)

The Art of 3D : Computer Animation and Effects / Isaac Victor Kerlow (various editions)