



**MONASH** University  
Information Technology

**FIT3001  
Advanced 3D**

**Unit Guide**

**Semester 1, 2014**

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# **FIT3001 Advanced 3D - Semester 1, 2014**

This unit builds upon the skills, techniques and theory introduced in FIT1033 Foundations of 3D towards an emphasis on 3D character design and modelling for animation. Students will be introduced to advanced techniques for character detailing (modelling and texturing) and character animation (rigging, binding and animation). The theoretical and practical considerations contributing to the conceptualisation, creation and preparation of 3D characters for animation sequences will constitute a key focus of this unit.

## **Mode of Delivery**

Caulfield (Day)

## **Workload Requirements**

Minimum total expected workload equals 12 hours per week comprising:

(a.) Contact hours for on-campus students:

- Two hours of lectures
- One 2-hour laboratory

(b.) Additional requirements (all students):

- A minimum of 2-3 hours of personal study per one hour of contact time in order to satisfy research and assignment expectations.

## **Unit Relationships**

### **Prohibitions**

MMS3409

### **Prerequisites**

FIT1033 or FIT2015

### **Chief Examiner**

Dr Tom Chandler

### **Campus Lecturer**

### **Caulfield**

**Tom Chandler (tom.chandler@monash.edu)**

Consultation hours: To be advised

## Tutors

### Caulfield

**David Lewis (david.lewis@monash.edu)**

Consultation hours: To be advised

## 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 the Student Evaluation of Teaching and Units (SETU) survey. 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, see:

[www.monash.edu.au/about/monash-directions/](http://www.monash.edu.au/about/monash-directions/) and on student evaluations, see:  
[www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html](http://www.policy.monash.edu/policy-bank/academic/education/quality/student-evaluation-policy.html)

## Previous Student Evaluations of this Unit

Based on previous student feedback this unit is well structured. The only change being made this semester is the inclusion of tutorial tests (three tests of 10% each) preceding each of the three major assignments.

If you wish to view how previous students rated this unit, please go to  
<https://emuapps.monash.edu.au/unitevaluations/index.jsp>

# Academic Overview

## Learning Outcomes

At the completion of this unit students will have:

- an understanding of the paradigms behind the development and application of computer generated 3D characters;
- an understanding of the principles of 3D animation theory and implementation, including character specific studies;
- a theoretical understanding of established and emerging procedures for 3D character modelling, detailing and preparation for animation;
- developed attitudes that enable them to appreciate the theories and practices adopted for complex 3D topology, modelling and animation techniques, including production pipelines;
- developed the ability to evaluate and implement suitable processes for 3D character creation and animation;
- developed the skills to design, model and texture original and geometrically efficient 3D characters;
- developed the skills to prepare (rig and bind) 3D characters for animation;
- developed the skills to animate and render 3D characters and objects.

## Unit Schedule

Week	Activities	Assessment
0		No formal assessment or activities are undertaken in week 0
1	Introduction: Character Creation for Animation	
2	Overview of Character Modelling Techniques	
3	Overview of Character Texturing Techniques	
4	Advanced Character Texturing and Modelling	Assignment 1 due Friday, Week 4 (20%)
5	Introduction to Character Rigging and Binding	Tutorial Test 1: Character Modelling (10%)
6	Character Rigging: Constraints and Controllers	
7	Character Manipulation, Articulated vs Flexible Binding	
8	Advanced Character Rigging, Binding and Constraint Techniques	Assignment 2 due Friday, Week 8 (20%)
9	Introduction to 3D Character Animation Process and Theory	Tutorial Test 2: Character Rigging and Controllers (10%)
10	Creating 3D Character Walk Cycle and Gestures	
11	Animation Blocking, Timing and Secondary Motion	
12	Animation Finalisation and Rendering	Tutorial Test 3: Character Animation (10%)
	SWOT VAC	No formal assessment is undertaken in SWOT VAC. Assignment 3 due Week 14 (30%)
	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 learning system.

## Teaching Approach

### Lecture and tutorials or problem classes

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

## Assessment Summary

In-semester assessment: 100%

Assessment Task	Value	Due Date
Tutorial Test 1: Basic Character Modelling, Component Assemblage and Texturing	10%	Week 5 Tutorial
Assignment 1: Modelling and Texturing your Character	20%	Friday, Week 4

## Unit Schedule

Tutorial Test 2: Character Rigging and Controllers	10%	Week 9 Tutorial
Assignment 2: Rigging, Binding and Preparing your Character for Animation	20%	Friday, Week 8
Tutorial Test 3: Character Animation	10%	Week 12 Tutorial
Assignment 3: Rendering a 20-30 second Animation	30%	Week 14

# Assessment Requirements

## Assessment Policy

Faculty Policy - Unit Assessment Hurdles

(<http://intranet.monash.edu.au/infotech/resources/staff/edgov/policies/assessment-examinations/assessment-hurdles>)

Academic Integrity - Please see resources and tutorials at

<http://www.monash.edu/library/skills/resources/tutorials/academic-integrity/>

## Assessment Tasks

### Participation

Because assignments in this unit build consequetively upon one another, and because of the precise technical nature of 3D animation, it is crucial that students attend as many lectures and tutorials as possible. To make this easier for students, lectures and tutorials have been scheduled close together on the same day.

#### • Assessment task 1

**Title:**

Tutorial Test 1: Basic Character Modelling, Component Assemblage and Texturing

**Description:**

This test reviews the basics of assembling a character out of constituent parts.

**Weighting:**

10%

**Criteria for assessment:**

- ◆ Modelling technique
- ◆ Assembly of 3D character geometry
- ◆ Basic texturing

**Due date:**

Week 5 Tutorial

#### • Assessment task 2

**Title:**

Assignment 1: Modelling and Texturing your Character

**Description:**

In Foundations of 3D, the final assignment involved the creation and basic texturing of an original game character. In the first assignment of Advanced 3D, we will be revisiting 3D character creation, though this time the emphasis is on the creation of a sophisticated, textured character model which will later be rigged (in Assignment 2) and animated (in Assignment 3).

Character modelling, rigging and animation in this unit will focus upon **articulated** characters, that is, characters that are made up of movable parts rather than soft, flexible or fluid assemblages. Examples of articulated characters include - but are not limited to - robots, armoured figures, insects and crustaceans.

**Weighting:**

20%



**Criteria for assessment:**

- ◆ Modelling technique and geometry
- ◆ UV texturing technique and detailing
- ◆ Finished renders of your model
- ◆ Visual and written documentation

**Due date:**

Friday, Week 4

• **Assessment task 3**

**Title:**

Tutorial Test 2: Character Rigging and Controllers

**Description:**

Your tutor will provide you with a sample articulated character. Your task is to rig this character (add an internal skeleton) and create animation controllers so that your character can be manipulated for animation.

**Weighting:**

10%

**Criteria for assessment:**

- ◆ Rigging procedures and execution
- ◆ Creation of working controllers

**Due date:**

Week 9 Tutorial

• **Assessment task 4**

**Title:**

Assignment 2: Rigging, Binding and Preparing your Character for Animation

**Description:**

Using the character you have created in Assignment 1, this assignment requires you to bind a functional rig (internal skeleton) and create functioning controllers so that you can manipulate and animate your character.

**Weighting:**

20%

**Criteria for assessment:**

- ◆ Rigging
- ◆ IK Chains
- ◆ Controllers
- ◆ Visual and written documentation

**Due date:**

Friday, Week 8

• **Assessment task 5**

**Title:**

Tutorial Test 3: Character Animation

**Description:**

In this test, your tutor will provide you with a sample rigged character with controllers and a subject theme. You will be required to manipulate the character and create keyframes to produce an animated timeline of 5-10 seconds.

**Weighting:**

## Assessment Requirements

10%

### Criteria for assessment:

- ◆ Character manipulation and keyframing
- ◆ Animation timing, weighting, gestures and actions

### Due date:

Week 12 Tutorial

## • Assessment task 6

### Title:

Assignment 3: Rendering a 20-30 second Animation

### Description:

This final assignment requires the animation of your character in a 20-30 second rendered sequence. The animation you plan and assemble should express the personality of your character and demonstrate the graphic and technical detailing you have invested in it through the course of the previous assignments.

### Weighting:

30%

### Criteria for assessment:

- ◆ Animation technique
- ◆ Animation narrative
- ◆ Three key renders from your animation
- ◆ Visual and written documentation

### Due date:

Week 14

## Learning resources

### Reading list

*Textbooks for Autodesk Maya will be available in the library:*

Todd Palamar, Eric Keller "Mastering Autodesk Maya 2014: Autodesk Official Press", Sybex, ISBN-10: 1118574966

See also:

Dariush Derakhshani "*Introducing Autodesk Maya 2014: Autodesk Official Press*" Sybex, ISBN-10: 1118574907

*Although Autodesk Maya updates its software annually, the principles of character creation, texturing, rigging and animation remain the same in earlier versions of the software. As such, textbooks published for earlier versions of Maya, especially in the last 4-5 years, will still be valid for the techniques we are studying in this unit. A number of earlier publications are listed below:*

Maraffi, Chris, "Maya Character Creation", Pearson, 2004, ISBN: 0-7357-1344-8

Wilkins, Mark, "Mel Scripting for Maya Animators", Elsevier, 2005, ISBN: 0-12-088793-2

Petitot, Luc, "Maya Ultimate Workshop", Editions Eyrolles, 2003, ISBN: 0-07-142169-6

## Assessment Requirements

Ratner, Peter, "Mastering 3D Animation", 2nd Edition, Allworth Press, 2004, ISBN: 1-58115-345-7

Ratner, Peter, "3D Human Modeling and Animation", Wiley, 2003, ISBN: 0-471-21548-1

Monash Library Unit Reading List (if applicable to the unit)

<http://readinglists.lib.monash.edu/index.html>

Faculty of Information Technology [Style Guide](#)

## Feedback to you

Examination/other end-of-semester assessment feedback may take the form of feedback classes, provision of sample answers or other group feedback after official results have been published. Please check with your lecturer on the feedback provided and take advantage of this prior to requesting individual consultations with staff. If your unit has an examination, you may request to view your examination script booklet, see

<http://intranet.monash.edu.au/infotech/resources/students/procedures/request-to-view-exam-scripts.html>

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

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

## 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.monash.edu.au/exams/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.

## Assignment submission

It is a University requirement

(<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-academic-integrity-managing-pla>

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). Please note that it is your responsibility to retain copies of your assessments.

## Online submission

If Electronic Submission has been approved for your unit, please submit your work via the learning system for this unit, which you can access via links in the my.monash portal.

## Required Resources

Please check with your lecturer before purchasing any Required Resources. Limited copies of prescribed texts are available for you to borrow in the library, and prescribed software is available in student labs.

Autodesk® Maya® 2014 software will be provided on campus lab computers, and students are encouraged to register with the Autodesk Education Community for their own educational trial version of Autodesk® Maya® 2014 and related Autodesk software under the company's terms and conditions.

Please see: <http://students.autodesk.com/>

## Technological Requirements

Lecture notes, tutorial notes and recommended links will be made available each week on Moodle, and students should check the unit Moodle page regularly for announcements.

As mentioned above, all required software will be provided on the lab computers, but students are welcome to bring their own laptop to tutorials if they wish. AutoDesk Maya 2014 runs on both PC and Mac computers, but students should be aware that it is very difficult to manage the Maya editing environment on small laptop screens. If you have a Mac computer, a standard PC mouse is recommended for right/left/middle mouse button operations.

## Recommended text(s)

Todd Palamar. (2013). *"Mastering Autodesk Maya 2014: Autodesk Official Press"*. () Sybex (ISBN: ISBN-10: 1118574966).

## Additional subject costs

Wooden articulated artist models, costing anywhere between \$7 and \$25 (depending on their size), are available at the Caulfield campus bookstore or at most art supply shops. These may be beneficial for students as animation and rigging references.

## 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:

[www.policy.monash.edu.au/policy-bank/academic/education/index.html](http://www.policy.monash.edu.au/policy-bank/academic/education/index.html)

Key educational policies include:

- Student Academic Integrity Policy and Student Academic Integrity: Managing Plagiarism and Collusion Procedures ;  
<http://www.policy.monash.edu/policy-bank/academic/education/conduct/student-academic-integrity-policy.h>
- Assessment in Coursework Programs;  
<http://www.policy.monash.edu/policy-bank/academic/education/assessment/assessment-in-coursework-po>
- Special Consideration;  
<http://www.policy.monash.edu/policy-bank/academic/education/assessment/special-consideration-policy.ht>
- 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/dates/>
- Orientation and Transition; <http://intranet.monash.edu.au/infotech/resources/students/orientation/>
- Academic and Administrative Complaints and Grievances Policy;  
<http://www.policy.monash.edu/policy-bank/academic/education/management/complaints-grievance-policy.h>

### Faculty resources and policies

Important student resources including Faculty policies are located at

<http://intranet.monash.edu.au/infotech/resources/students/>

### Graduate Attributes Policy

<http://www.policy.monash.edu/policy-bank/academic/education/management/monash-graduate-attributes-policy.h>

### Student Charter

[www.opq.monash.edu.au/ep/student-charter/monash-university-student-charter.html](http://www.opq.monash.edu.au/ep/student-charter/monash-university-student-charter.html)

### 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 <http://www.monash.edu.au/students>. For Malaysia see <http://www.monash.edu.my/Student-services>, and for South Africa see <http://www.monash.ac.za/current/>.

## Monash University Library

The Monash University Library provides a range of services, resources and programs that enable you to save time and be more effective in your learning and research. Go to [www.lib.monash.edu.au](http://www.lib.monash.edu.au) or the library tab in [my.monash](http://my.monash) portal for more information. At Malaysia, visit the Library and Learning Commons at <http://www.lib.monash.edu.my/>. At South Africa visit <http://www.lib.monash.ac.za/>.

## Disability Liaison Unit

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://www.monash.edu/equity-diversity/disability/index.html>
- Telephone: 03 9905 5704 to book an appointment with a DLO; or contact the Student Advisor, Student Community Services at 03 55146018 at Malaysia
- Email: [dlu@monash.edu](mailto:dlu@monash.edu)
- Drop In: Equity and Diversity Centre, Level 1, Building 55, Clayton Campus, or Student Community Services Department, Level 2, Building 2, Monash University, Malaysia Campus

## Other

Tutorials will **begin in Week 1** and end in Week 12.