



# MDDN 441

## Computer Graphics for Film

### Course Outline Trimester 1, 2014

#### GENERAL

Trimester 1; 30 points

#### ASSESSMENT

100% internal by assignment

#### CLASS TIMES AND LOCATIONS

LECTURES:	Tuesday	15:40 – 18:40	Room: WG 201
	Friday	15:40 – 18:40	Room: WG 201

#### COORDINATOR

##### Coordinator

*Name: Rhazes Spell*

*Room: W408*

*Phone: 463 6234*

*Office Hours: Monday, 4:00pm – 5:00pm*

*Email: [rhazes.spell@vuw.ac.nz](mailto:rhazes.spell@vuw.ac.nz)*

For Tutor details please visit the course blog via: [blackboard.vuw.ac.nz](http://blackboard.vuw.ac.nz)

## COMMUNICATION OF ADDITIONAL INFORMATION

Any changes or additions to this Course Outline will be discussed and agreed with the class, and conveyed via email or through the course blog on the School of Design Teaching and Learning website: [blackboard.vuw.ac.nz](https://blackboard.vuw.ac.nz)

## PRESCRIPTION

This course covers computer graphics techniques that are used as current practice in the film industry. While working on projects that span a range of approaches for generating special effects, and algorithmic treatment of media, students will also review and analyse cinematic examples.

## COURSE CONTENT

This course introduces students to procedural modelling, procedural animating and scripting techniques for the creation and manipulation of graphics for film, motion graphics and time-based media. Students will be learning these techniques within an industrial standard 3D software tool. Students will also strengthen their mathematical and computational skills through fun application in creative projects.

## COURSE LEARNING OBJECTIVES

Students who pass this course will be able to:

- 1: Design procedures for creating environments, effects, animations and graphics.
- 2: Apply mathematical ideas to solve geometric and animation challenges.
- 3: Create digital components for other artists to apply in their creations.
4. Clearly present information and concepts to technical specialists and artists.

## TEACHING FORMAT

This course will be administered through lectures, interactive in-class assignments and assigned projects. The assignments will contain a mix of individual and small group projects. All assignments and projects will frequently be reviewed in class. Students are expected to contribute to critical discussion and assessment of submitted work.

All course materials, project descriptions, important dates, reference materials and required readings will be available on the internal network or on the course blog, located on the School of Design Teaching and Learning website, see: [blackboard.vuw.ac.nz](https://blackboard.vuw.ac.nz)

## MANDATORY COURSE REQUIREMENTS

There are no specific mandatory course requirements other than those listed under Assessment.

## WORKLOAD

As per the handbook the expected workload in this course is approximately 20 hrs/week. The workload consists of lecture time, in-class work time and review, and external work on projects.

<https://intranet.victoria.ac.nz/academic/staff-resources/assessment.aspx>

Attendance and participation is an important aspect of the learning process, and you are required to attend all lectures and tutorials.

If extraordinary circumstances arise that require you to be absent from some class sessions, you should discuss the situation with the Course Coordinator as soon as possible.

You should expect to spend around 300 hours on this course, including both scheduled class time and independent study. Typically this involves around 20 hours per week during the 12 teaching weeks, with the balance during the mid-trimester break and examination period.

Please check out the link below with information on Studio Courses:

[www.victoria.ac.nz/fad/faculty-administration/current-students#studioculturepolicy](http://www.victoria.ac.nz/fad/faculty-administration/current-students#studioculturepolicy)

## ASSESSMENT

Assessment items and workload per item		Due	%	CLO(s)
1	Workshop 1 – Phyllotaxis Patterning Extend a digital asset presented in class to create user customizable flower patterns (assessed by software and presentation material).	18 Mar	10%	1 2 3 4
2	Workshop 2 – Fizz Buzz Implement a solution to the Fizz Buzz question using the tools presented in class (assessed by software).	25 Mar	10%	2
3	Workshop 3 – Data As Narrative Design and implement a data display to be used as a character in a motion piece (assessed by software, in class reviews and presentation material).	08 Apr	25%	1 2 3 4
4	Project 1 – Procedural Building Generation Design and implement a Digital Asset for creating buildings (assessed by software, in class reviews and presentation material).	09 May	30%	1 2 3 4
5	Project 2 – Open Project Propose and implement a tool that is based on a topic covered during the trimester. The tool can include an implementation of an asset from a film, a re-implementation of an effect, an artist tool or plug-in for a 3 <sup>rd</sup> party software package or any other instructor approved concept.	06 Jun	25%	1 2 3 4

## Workshop 1 – Phyllotaxis Patterning

“Phyllotaxis is the arrangement of leaves on a plant stem” (wikipedia). Interest in the mathematical functions underlying this natural phenomena date back to the 19<sup>th</sup> century, and its relationship to the Fibonacci sequence is well known. In this project we will examine Fermat’s equation for phyllotaxis in the context of Houdini. We will use this exercise to explore how computational ideas can be represented in Houdini and to begin getting comfortable with the operators that the package offers. In addition, the project will give you an introduction to designing custom UI’s for your tools.

### Project Requirements:

Develop an asset in Houdini that allows users to create phyllotactic patterns. **FROM THE TOP LEVEL** the UI should allow users to:

- adjust the angle
- adjust the size of petals
- adjust the number of petals
- adjust the petal spread

- Your HIP file should be organized, commented and use sticky notes. An external person should be able to follow your network.

### Handin Requirements:

- **LastnameFirstnameExercise1.hipnc**
- **MDDN441 Workshop 1- Phyllotactic Pattern Demo** Blog entry. Create a write-up describing the project and your solution. You should cover your approach, any interesting things that you learned about Houdini that might be of interest to another VFX developer and any lessons learned. Use the examples of VFX breakdowns that we discuss in class as a guide
- **LastnameFirstnameExercise1.png** still image of a flower using your tool
- **LastnameFirstnameExercise.mov** screen capture of your tool in action. Consider creating an animation of your flower or a field of your flowers.
  - o **Movie Format Requirements:**
    - **1280x720 (720p)**
    - **H.264 compression**
    - **Quicktime .mov format**
    - **Title screen (template to be provided, do NOT change the template)**
    - **Credits screen (template to be provided, do NOT change the template)**

### Assessment:

- Accurate completion of handin requirements
- Presentation of your solution
- Quality, usability and organization of the asset

**Due: 18 Mar**

Weighting: 10%

## Workshop 2 – Fizz Buzz

Fizz Buzz is a children's game that teaches division (wikipedia). It has also become a standard programming question in job interviews to test basic programming skill. This assignment will give you practice in implementing logic to solve problems in Houdini and control presentation.

### Project Requirements:

Develop an asset in Houdini that allows users to see the Fizz Buzz solution printed in columns on the screen.

**FROM THE TOP LEVEL** the UI should allow users to:

- adjust the numeric limit of the Fizz Buzz sequence
- Use the viewport to display the columnar output of the sequence. (A reference image will be provided in class)

- Your HIP file should be organized, commented and use sticky notes. An external person should be able to follow your network.

### Handin Requirements:

- **LastNameFirstnameExercise1.hipnc**

### Assessment:

- Accurate completion of handin requirements
- Accurate completion of the project requirements

**Due: 25 Mar**

Weighting: 10%

## Workshop 3 – Data As Narrative

Modern cinema is filled with examples of data interfaces. These interfaces serve as characters that represent technical prowess (Swordfish, Minority Report), complexity (Iron man) and technological advancement (Terminator). Houdini has been referred to as more than a 3D graphics program, but a 3D operating system. As a result of its procedural nature it is an ideal tool for creating these types of assets.

### Project Requirements:

Develop an asset in Houdini that allows users to customize a Data Display that you design. You may design your own data display, re-implement a display from a film or a combination of the too. All external sources **MUST** be cited and presented. The data display should animate and the user should be able to customize the animation and the look and feel of the data display. All controls should be accessible from the top level of the asset.

- Your HIP file should be organized, commented and use sticky notes. An external person should be able to follow your network.

### Handin Requirements:

- **LastnameFirstnameExercise1.hipnc**
- **MDDN441 Workshop 3 – Data as Narrative** Blog entry. Create a write-up describing the project and your solution. You should cover your inspiration and concept, your approach, any interesting things that you learned about Houdini that might be of interest to another VFX developer and any lessons learned. Use the examples of VFX breakdowns that we discuss in class as a guide. You should explain any tricks and tips that you used to create your project so that another Houdini user could consider implementing something similar.
- **LastnameFirstnameExercise1.png** HD hero shot of your display
- **LastnameFirstnameExercise.mov** screen capture of your tool in action. Consider creating an animation of your data display in “Live” mode.
  - **Movie Format Requirements:**
    - **1280x720 (720p)**
    - **H.264 compression**
    - **Quicktime .mov format**
    - **Title screen (template to be provided, do NOT change the template)**
    - **Credits screen (template to be provided, do NOT change the template)**

#### **Assessment:**

- Accurate completion of handin requirements
- Presentation of your solution
- Quality, usability and organization of the asset

#### **Calendar:**

**28 Mar:** Concepts Due

**Due: 08 Apr**

Weighting: 25%

# Project 1 – Procedural Building Generation

The procedural nature of Houdini makes it very compelling to drive variation of form easily. This makes it an ideal platform for creating custom tools for artists to create assets for film and games. Increasingly the power of the tool is being recognized by other digital creators in other communities such as the scientific and architectural fields. In this project you will use Houdini to create a tool that a game designer, technical director or architect might use to visualize and iterate different concepts for a building.

## Project Requirements:

- Use the FAD library to find a building as inspiration for this project. You do not have to do a literal interpretation of the building it can serve as a reference for the skeleton of your design or your overall design direction. Provide reference images of your building for class discussion and final documentation. If you are using web images, save the URL. If you are using a book you will need to cite the book and pages for the referenced images.

Develop an asset in Houdini that allows users to customize a building. The asset should have **TOP LEVEL** UI that allows users to control the buildings configuration.

Your building must:

- allow changing the dimensions of (depth, width and height)
- changes in the façade of the building (windows, balconies, doors, etc.)
- contain an entry
- contain openings to the outside
- use different materials

- Your HIP file should be organized, commented and use sticky notes. An external person should be able to follow your network.

## Handin Requirements:

- **LastNameFirstnameExercise1.hipnc**
  - o **/reference** include your reference images. In a PDF file (**reference.pdf**) provide the URL and / or MLA book citation for your references.
  - o **/textures** If you use textures for your building place them in a sub-directory of \$HIP. Be sure to use relative references for all files in your project.
- **MDDN441 Project 1 – Procedural Building** Blog entry. Create a write-up describing the project and your solution. You should show your reference image and your development process. Cover your inspiration and concept, your approach, any interesting things that you learned about Houdini that might be of interest to another VFX developer and any lessons learned. Use the examples of VFX breakdowns that we discuss in class as a guide. You should explain any tricks and tips that you used to create your project so that another Houdini user could consider implementing something similar.
- **LastNameFirstnameExercise1.png** HD image of your interface and your building (this can be a composited image). This should be production quality (i.e. well lit and shaded).
- **LastNameFirstnameExercise.mov** A 10 second video of your final model.
  - o The first 5 seconds should be a turntable rotation of your model. Use your judgement about the shot composition. The model should rotate no more than 10degrees per second.
  - o In the final 5 seconds show the range of looks that your model can generate. These should be **RENDERS** not screen captures.
  - o Include a screenshot of your interface.
  - o **Movie Format Requirements:**
    - **1280x720 (720p)**
    - **H.264 compression**
    - **Quicktime .mov format**

- **Title screen (template to be provided, do NOT change the template)**
- **Credits screen (template to be provided, do NOT change the template)**

#### **Assessment:**

- Accurate completion of handin requirements
- Presentation of your solution
- Quality, usability and organization of the asset

#### **Calendar:**

**11 Apr:** Concepts Due

**06 May:** Render Review

**Due: 09 May**

Weighting: 30%

## **Project 2 – Open Project**

For your final project you will propose a topic of interest to pursue. The topic must relate to either a topic covered in class, an extension of a previous assignment or a topic related to Houdini that has not been covered in class. You will prepare a concept presentation and pitch.

#### **Project Requirements:**

- Your concept must have instructor permission to be accepted as a final project.

#### **Handin Requirements:**

- **LastnameFirstnameExercise1.hipnc**
  - **/reference** include your reference images. In a PDF file (**reference.pdf**) provide the URL and / or MLA book citation for your references.
  - **Additional directories will be detailed on a project basis.**
- **MDDN441 Project 2 – Procedural Building** Blog entry. Create a write-up describing the project and your solution. You should show your reference image and your development process. Cover your inspiration and concept, your approach, any interesting things that you learned about Houdini that might be of interest to another VFX developer and any lessons learned. Use the examples of VFX breakdowns that we discuss in class as a guide. You should explain any tricks and tips that you used to create your project so that another Houdini user could consider implementing something similar.
- **LastnameFirstnameExercise###.png** HD images of your project. You may include additional images as needed.
- **LastnameFirstnameExercise.mov**
  - Details on documentation movie will be provided on a project basis.
  - **Movie Format Requirements:**
    - **1280x720 (720p)**
    - **H.264 compression**
    - **Quicktime .mov format**
    - **Title screen (template to be provided, do NOT change the template)**
    - **Credits screen (template to be provided, do NOT change the template)**

#### **Assessment:**

- Accurate completion of handin requirements



- Presentation of your solution
- Quality, usability and organization of the asset

Calendar:

**DUE: 06 JUN**

Weighting: 25%

The School has a long tradition of providing *critical review* of student work as it progresses especially in design projects. For further information please refer to the Website below:

[www.victoria.ac.nz/fad/faculty-administration/current-students/faqs#criticalreview](http://www.victoria.ac.nz/fad/faculty-administration/current-students/faqs#criticalreview)

All grades posted during this course are only provisional results until confirmed by the School Examiners Committee which meets after the examination period.

**Note: Victoria's grading system is changed for Trimester 1, 2014 with the introduction of a new C- grade.**

<http://www.victoria.ac.nz/students/study/progress/grades>

## SUBMISSION AND RETURN OF WORK

Each student is responsible for ensuring their work is submitted to their Course Tutor or Course Coordinator on time and in the required format.

Work submitted late must be submitted to the Course Coordinator. Late submissions will be penalised as set out below, unless an extension is approved by the Course Coordinator.

## EXTENSIONS

In the event of illness or other extraordinary circumstances that prevent you from submitting and/or presenting a piece of work on time, or that you feel adversely affect the quality of the work you submit, it is important that you discuss your circumstances with the Course Coordinator as soon as possible so that appropriate arrangements may be made. You should complete an Application for Extension form (available from the Faculty Office) for the Course Coordinator to approve. You will also need to provide suitable evidence of your illness or other circumstances. In an emergency, or if you are unable to contact the Course Coordinator, you should advise the Faculty Office of your situation.

## PENALTIES

If no extension has been approved, the following penalties will be applied:

- Failure to personally present work at any scheduled graded review will result in an automatic failing grade of E (maximum mark of 39%) for the work being reviewed;
- Work submitted late will receive a failing grade of E (maximum mark of 39%);
- Any work not submitted within 5 working days of the due date will be recorded as a non-submission (0%).

## REQUIRED MATERIALS AND EQUIPMENT

Students will need to provide all materials and equipment as necessary for the completion of required work. Please check the website link below for the standard requirements:

[www.victoria.ac.nz/fad/faculty-administration/current-students/faqs#materialsandequipment](http://www.victoria.ac.nz/fad/faculty-administration/current-students/faqs#materialsandequipment)

## **SET TEXTS**

Reading will be posted on the Course Blackboard site.

## **RECOMMENDED READING**

Recommended Reading will be posted on the Course Blackboard site.

## SCHEDULE OF SESSIONS

Week Month	Day	Date	Item	Locations	Time	Comments
Week 9 February	M	24				Orientation Week
	TU	25				
	W	26				
	TH	27				
	F	28				
Week 10 March	M	3				Trimester 1 Begins
	TU	4		WG201	3:40 – 5:30	
	W	5				
	TH	6				
	F	7		WG201	3:40 – 5:30	
Week 11 March	M	10				
	TU	11		WG201	3:40 – 5:30	W1 OUT
	W	12				
	TH	13				
	F	14		WG201	3:40 – 5:30	<i>This is the last date that you can withdraw with a full fees refund</i>
Week 12 March	M	17				
	TU	18		WG201	3:40 – 5:30	W1 DUE; W2 OUT
	W	19				
	TH	20				
	F	21		WG201	3:40 – 5:30	
Week 13 March	M	24				
	TU	25		WG201	3:40 – 5:30	W2 DUE; W3 OUT
	W	26				
	TH	27				
	F	28		WG201	3:40 – 5:30	W3 CONCEPTS DUE
Week 14 March/April	M	31				
	TU	1		WG201	3:40 – 5:30	
	W	2				
	TH	3				
	F	4		WG201	3:40 – 5:30	
Week 15 April	M	7				
	TU	8		WG201	3:40 – 5:30	W3 DUE; P1 OUT
	W	9				
	TH	10				
	F	11		WG201	3:40 – 5:30	
Week 16 April	M	14				
	TU	15		WG201	3:40 – 5:30	
	W	16				
	TH	17				
	F	18				Good Friday – holiday
Week 17 April	M	21				Easter Monday – holiday Mid-Trimester Break
	TU	22				Easter Tuesday – VUW holiday
	W	23				
	TH	24				
	F	25				Anzac Day – holiday

<b>Week 18 April</b>	M	28				
	TU	29				
	W	30				
	TH	1				
	F	2				
<b>Week 19 May</b>	M	5				
	TU	6		WG201	3:40 – 5:30	
	W	7				
	TH	8				
	F	9		WG201	3:40 – 5:30	P1 DUE; P2 OUT
<b>Week 20 May</b>	M	12				
	TU	13				
	W	14				
	TH	15				
	F	16		WG201	3:40 – 5:30	<i>After this date the Associate Dean's approval is required for withdrawals from Trimester 1 courses.</i>
<b>Week 21 May</b>	M	19				
	TU	20		WG201	3:40 – 5:30	
	W	21				
	TH	22				
	F	23		WG201	3:40 – 5:30	
<b>Week 22 May</b>	M	26				
	TU	27		WG201	3:40 – 5:30	
	W	28				
	TH	29				
	F	30		WG201	3:40 – 5:30	
<b>Week 23 June</b>	M	2				Queen's Birthday – holiday
	TU	3		WG201	3:40 – 5:30	
	W	4				
	TH	5				
	F	6		WG201	3:40 – 5:30	P2 DUE
<b>Week 24 June</b>	M	9				Study/Examination Period
	TU	10				
	W	11				
	TH	12				
	F	13				Examination Period begins
<b>Week 25 June</b>	M	16				
	TU	17				
	W	18				
	TH	19				
	F	20				
<b>Week 26 June</b>	M	23				
	TU	24				
	W	25				
	TH	26				
	F	27				
<b>Week 27 June/July</b>	M	30				
	TU	1				
	W	2				Examination Period ends
	TH	3				Mid-year Break begins
	F	4				

## CLASS REPRESENTATIVES

The Faculty of Architecture and Design operates a system of Class Representatives in 100-level courses, and Year Representatives in each of the professional disciplines. Student Representatives are elected during a class session in the first week of teaching. All Student Representatives will be listed on the STUDiO notice board in the Atrium, and the relevant Representatives are also listed on studio notice boards. Student Representatives have a role in liaising between staff and students to represent the interests of students to the academic staff, and also in providing students with a communication channel to STUDiO and the Student Representation organiser.

Class Rep name and contact details:

## STUDENT FEEDBACK

The Course Coordinator will discuss feedback from previous students at an appropriate time during the course.

**Student feedback on University courses may be found at** [www.cad.vuw.ac.nz/feedback/feedback\\_display.php](http://www.cad.vuw.ac.nz/feedback/feedback_display.php). ]

## OTHER IMPORTANT INFORMATION

The information above is specific to this course. There is other important information that students must familiarise themselves with, including:

- Academic Integrity and Plagiarism: [www.victoria.ac.nz/home/study/plagiarism](http://www.victoria.ac.nz/home/study/plagiarism)
- Aegrotats: [www.victoria.ac.nz/home/about/avcacademic/publications2#aegrotats](http://www.victoria.ac.nz/home/about/avcacademic/publications2#aegrotats)
- Academic Progress: [www.victoria.ac.nz/home/study/academic-progress](http://www.victoria.ac.nz/home/study/academic-progress) (including restrictions and non-engagement)
- Dates and deadlines: [www.victoria.ac.nz/home/study/dates](http://www.victoria.ac.nz/home/study/dates)
- Faculty Current Students site: [www.victoria.ac.nz/fad/faculty-administration/current-students](http://www.victoria.ac.nz/fad/faculty-administration/current-students)
- Grades: <http://www.victoria.ac.nz/students/study/progress/grades>
- Resolving academic issues: [www.victoria.ac.nz/home/about/avcacademic/publications2#grievances](http://www.victoria.ac.nz/home/about/avcacademic/publications2#grievances)
- Special passes: [www.victoria.ac.nz/home/about/avcacademic/publications2#specialpass](http://www.victoria.ac.nz/home/about/avcacademic/publications2#specialpass)
- Statutes and policies including the Student Conduct Statute: [www.victoria.ac.nz/home/about/policy](http://www.victoria.ac.nz/home/about/policy)
- Student support: [www.victoria.ac.nz/home/viclife/student-service](http://www.victoria.ac.nz/home/viclife/student-service)
- Students with disabilities: [www.victoria.ac.nz/st\\_services/disability](http://www.victoria.ac.nz/st_services/disability)
- Student Charter: [www.victoria.ac.nz/home/viclife/student-charter](http://www.victoria.ac.nz/home/viclife/student-charter)
- Student Contract: [www.victoria.ac.nz/home/admisenrol/enrol/studentcontract](http://www.victoria.ac.nz/home/admisenrol/enrol/studentcontract)
- Turnitin: [www.cad.vuw.ac.nz/wiki/index.php/Turnitin](http://www.cad.vuw.ac.nz/wiki/index.php/Turnitin)
- University structure: [www.victoria.ac.nz/home/about](http://www.victoria.ac.nz/home/about)
- VUWSA: [www.vuwsa.org.nz](http://www.vuwsa.org.nz)