

**School of the Arts, Media, Performance and Design**  
**Digital Media**  
**FA/DATT 2501 3.0 Winter Term 2017**

|   |  |                     |                      |
|---|--|---------------------|----------------------|
| Course Director: Haru (Hyunkyung) Ji  | haruoneday@gmail.com   |                     |                      |
| Course website: <a href="http://jiharu.github.io/datt2501/">http://jiharu.github.io/datt2501/</a> | Course portfolio: (Lab 01) <a href="http://2017datt2501.tumblr.com/">http://2017datt2501.tumblr.com/</a> |                     |                      |
| Office: 229 Goldfarb Centre for Fine Arts   | (Lab 02) <a href="https://2017datt2501-02.tumblr.com/">https://2017datt2501-02.tumblr.com/</a>           |                     |                      |
| Office Hours: Tue / Fri by appointment  | (Lab 02) <a href="https://2017datt2501-03.tumblr.com/">https://2017datt2501-03.tumblr.com/</a>           |                     |                      |
| Lecture: Tuesday 9:30 to 10:20  |  |                     |                      |
| Lab location: ACW 102   | Lecture location: ACW 005.   |                     |                      |
| Lab 01  | Tuesday 10:30-12:20  | Haru (Hyunkyung) Ji | haruoneday@gmail.com |
| Lab 02  | Tuesday 12:30-2:20   | Joe Hambleton       | jhambltn@york.ca     |
|   | Digital Media Technician   | Frank Tsonis        | tsonfr@yorku.ca      |

## **Introduction to 3D Animation**

### **Course Description:**

The 3D animation class is designed for students to learn both practical and theoretical knowledge in constructing three-dimension animation. It is a complex interdisciplinary subject of artistic expression and technological understanding, requiring an open creative mindset from students. Throughout the class, there will be several projects to help students build problem solving abilities toward the subject in an incremental way. Each class consists of a one hour lecture and two hours of lab practice to accomplish a combined theoretical and practical approach. The main software used in the class is Autodesk Maya, which has very strong support for modeling and animation as well as other related stages of the production pipeline.

### **Students will learn:**

Theoretical points: comparison between 'traditional' and digital animation / histories and principles of animation / examining animation ideas / production workflow.

Practical points: Maya interface / key-frame animation / path animation / rigging / FK and IK kinematics / deformers & blend shape / Motion capture data & retargeting / particle animation / camera & lighting animation / Game engine exporting.

Details may change by circumstance.

**Prerequisite:** DATT2500 Introduction to 3D modeling (or equivalent).

### **Course Objectives:**

- To build a framework of skills and vocabulary to create and modify 3D animation data.
- To understand the fundamental components and their position in the production pipeline of 3D animation art-making.
- To appreciate the interdisciplinary research attitudes of art and technology (via computer graphics).
- To invest independent and artistic expression along with problem solving processes during construction.
- To develop awareness of current 3D animation practices through diverse examples of animation, films, video games, virtual worlds, and so on.

There will be three projects and several minor assignments. It is expected that the majority of the assignments will be completed outside of class time. If you plan to use the lab outside of your class time, you must purchase a Digital Media Lab Card. Lab Cards are \$30 for the year, or \$20 for one term. The Digital Media Lab Card can be purchased in the Digital Media office, located in Rm. 232, Goldfarb Centre for Fine Arts. The office is open Monday to Friday, 8:30am-4:30pm.

## **Project Description:**

More details regarding projects and assignments will be announced in class.

**Project 1- Bouncing ball (5 seconds - 150 frame):** With your definition of certain characteristics of a ball, either emotional or physical: e.g., cheerful, weighty, fluffy..., create your 5 seconds length bouncing ball animation. You will submit a Playblast hardware rendering animation along with a brief explanation.

**Project 2- Walking animation a rigged character (10 seconds - 300 frame):** details will be announced in the class.

**Project 3- 15 seconds completed animation, using a software renderer:** details will be announced in the class.

Assignments: simple hands-on practices designed to help students' progress following each 3D animation subtopic. Completion in time and proper targeting to the subject are the two evaluation criteria.

## **Issues to consider:**

- Please be patient to repeat practice exercises until you feel familiar with the logic & structure of the 3D software interface, pipeline, processes, and vocabularies since the complexities can overwhelm. If you have any question or difficulty following, don't hesitate to ask the instructors.
- Develop your unique preference as a maker/producer among a variety of 3D animation methods.
- If you have high fluency using 3D software, then investigate near-future trends.
- When you research examples of 3D artwork, try to avoid popular mass productions such as Pixar's or Dreamwork's; instead find a specific animator and investigate his/her portfolio as an independent artist.
- Explore many usages of 3D animation in different areas to develop a unique and sensitive style, such as entertainment, education, medical, manufactural, and so on.

As this is a cumulative learning environment attendance in all classes is mandatory. Failure to attend class and arrive to class on time will result in academic penalty on your final grade, and/or a request for withdrawal from the course. Exceptions to the lateness penalty for valid reasons such as illness, compassionate grounds, etc., will be considered by the Course Instructor but will require supporting documentation (e.g., a doctor's letter).

Projects and assignments to be marked for course credit will be submitted through Moodle on the scheduled date. There will be no extensions except for verified reasons. All work submitted for evaluation will be original work created in full by the student. York students are required to maintain high standards of academic integrity and are subject to the Senate Policy on Academic Honesty (<http://www.yorku.ca/secretariat/legislation/senate/acadhone.htm>). It is highly recommended that all students complete the Academic Integrity Tutorial ([http://www.yorku.ca/tutorial/academic\\_integrity/](http://www.yorku.ca/tutorial/academic_integrity/)).

Sharing information is recommended to accelerate the speed of progress, unless it interrupts other students' concentration. Students will share their assignments through the Tumblr website (<http://2017datt2501.tumblr.com/>). Questions and discussions are encouraged during class time.

## Grade Breakdown:

|  |     |
|--|-----|
| Project 1- Bouncing ball (5 seconds - 150 frame)                         | 15% |
| Project 2- Walking animation a rigged character (10 seconds - 300 frame) | 20% |
| Project 3- 15 seconds completed animation, using a software renderer.    | 30% |
| Assignments & attendance   | 35% |

Failure to complete any project, assignment or to participate in lectures and lab practice will result in failure of the class. It is mandatory for all students to adhere to the course schedule.

The evaluation will be based on cumulative achievement, regular attendance and the student's participation in research, making, and creative expression. It is expected that students will show a commitment to completing all projects and assignments with creative & aesthetic solutions based consistent work habits both in class time and outside of class time.

## Evaluation/Grading Criteria:

- Quality of the work produced; with the balance of the student's artistic expression & sensitivity as well as technical understanding, with integration of techniques and subject.
- Ability to use 3D animation techniques and to solve problems into the process of making.
- The progress and engagement of the student in their research studies, as well as their curiosity and motivation to learn and achieve.
- The degree and details to which students can set challenges for her or himself.
- Commitment (includes attendance, participation, completing work on time, ambition of project)

| Grade | Grade Point | Per-Cent Range      | Description        |
|-------|-------------|---------------------|--------------------|
| A+    | 9           | 90-100              | Exceptional        |
| A     | 8           | 80-89               | Excellent          |
| B+    | 7           | 75-79               | Very Good          |
| B     | 6           | 70-74               | Good               |
| C+    | 5           | 65-69               | Competent          |
| C     | 4           | 60-64               | Fairly Competent   |
| D+    | 3           | 55-59               | Passing            |
| D     | 2           | 50-54               | Marginally Passing |
| E     | 1           | Marginally below 50 | Marginally Failing |
| F     | 0           | Below 50            | Failing            |

(For a full description of York grading system see the York University Undergraduate Calendar - [http://calendars.registrar.yorku.ca/pdfs/ug2004cal/calug04\\_5\\_acadinfo.pdf](http://calendars.registrar.yorku.ca/pdfs/ug2004cal/calug04_5_acadinfo.pdf))

## Computer Lab:

Please turn your cell phones off before entering class and/or the computer lab. Please clean your seat and log out before you leave for a next lab session. If you have any questions about using the lab, address them to the lab technician or instructor.

## Supplies:

Students will be required to supply headphones in the lab to follow web tutorials. Please also bring a notebook or small sketchbook and pencils to collect and sketch ideas.

## Course Texts and References:

(not mandatory to purchase)

- Maya Help File (in Maya menu, F1 key)
- The Art of Maya: An Introduction to 3D Computer Graphics by Autodesk Maya Press
- Getting Started in 3D with Maya by Adam Watkins, Focal Press, 2012
- Introducing Autodesk Maya 2016: Autodesk Official Press by Dariush Derakhshani, Sybex, 2015
- Mastering Autodesk Maya 2016: Autodesk Official Press by Todd Palamar, Sybex, 2015
- Autodesk Maya 2014 Essentials by Paul Naas, Sybex, 2013
- Digital Art Masters series by 3DTotall publishing
- Character Animation Fundamentals by Steve Roberts, Focal Press, 2012
- Rig it Right! Maya Animation Rigging Concepts by Tina O'Hailey, Focal Press, 2013
- The Animator's Survival Kit: A Manual of Methods, Principles and Formulas for Classical, Computer, Games, Stop Motion and Internet Animators, by Richard Williams, Faber & Faber, 4 edition 2012
- Rigging for Games by Eyal Assaf, Focal Press, 2015

## Useful Links:

[http://knowledge.autodesk.com/support/maya#?p=MAYAUL&p\\_disp=Maya&sort=score](http://knowledge.autodesk.com/support/maya#?p=MAYAUL&p_disp=Maya&sort=score)

<http://forums.cgsociety.org/>

<http://www.creativecrash.com/maya/>

<http://www.angryanimator.com/word/2010/11/26/tutorial-2-walk-cycle/>

<http://www.melscripting.com/>

Digital sculpting: <http://pixologic.com/sculptris/>

Tutorial by Yifat Shaik: <https://tplinnovator.wordpress.com/>

And more online tutorials.

## Important Course Information For Students:

All students are expected to familiarize themselves with the following information, available on the Senate Committee on Academic Standards, Curriculum & Pedagogy webpage (see Reports, Initiatives, Documents)

- <http://www.yorku.ca/secretariat/senate/committees/ascp/documents/CourseInformationForStudentsAugust2012.pdf>
- Senate Policy on Academic Honesty and the Academic Integrity Website
- Ethics Review Process for research involving human participants
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Religious Observance Accommodation

## Course Schedule:

**Week 1 (January 10):** Lecture: Overview of the course: review course outline, intro to projects. Intro to computer animation. Lab: Set-up account for the class portfolio website. Intro to Maya animation interface and key-framing animation. Assignment 1.

**Week 2 (January 17):** Lecture: Animation theory. Lab: Fundamental principles of animation. Bouncing ball animation. Using Graph Editor & Playblast, Assignment 2.

**Week 3 (January 24):** Lecture: Understanding Maya architecture and the dependency graph. Animation project pipeline. Lab: Deformation. **Project 1: Bouncing ball with characteristics (5 seconds - 150 frame).**

**Week 4 (January 31):** Lecture: Maya animation techniques: Motion Path animation & Set Driven Key. Lab: Hands-on tutorials, Assignment 3.

**Week 5 (February 7):** Lecture: Joint System, Kinematics (IK & FK). Lab: Create basic joint systems. Assignment 4.

**Week 6 (February 14):** Lecture: Skinning (rigging) : weights & controllers. Lab: Practice rigging. Assignment 5.

**Reading week (February 21).**

**Week 7 (February 28):** Lecture & Lab: Character rigging using HIK. Assignment 6.

**Week 8 (March 7):** Lecture & Lab: Character rigging: retargeting using motion capture data. Assignment 7.

**Week 9 (March 14):** Lecture & Lab: Walking cycle I. Assignment 8.

**Week 10 (March 21):** Lecture & Lab: Walking cycle II. **Project 2: Walking animation with a rigged character (10 seconds - 300 frame)**

**Week 11 (March 28):** Lecture & Lab: Batch rendering. Assignment 9.

**Week 12 (April 4):** Lecture & Lab: Importing your animated character into the Unreal game engine 4. **Project 3: Completed animation (15 seconds - 450 frame)**