

Computer 3-D: Modeling, Rendering, and Animation / 4 Credits
Fall 2014
T/R 11:15 AM – 2:15 PM

Instructor: Dengke Chen
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Office hours: T 6 PM – 8 PM (by apt.)
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Course description

This is an introductory course for 3-D computer generated artwork and content creation using modeling, rigging, and animation applications on the computer. No previous animation experience required.

Supply and equipment list

External Hard Drive or Flash Drive for Backup (10+ GB)
Headphones (for in-class tutorial viewing)

Recommended Texts

Introducing Autodesk Maya 2014 (Autodesk Official Press) ISBN-10: 1118574907
Mastering Autodesk Maya 2014 (Autodesk Official Press) ISBN-10: 1118574966

Software

Maya, Photoshop, After Effects, Premiere.

Course Objectives

Upon completing the course each student will have:

- Learned the basics of Modeling, Rigging, 3D Animation, and production and post-production.
- Completed technical/conceptual projects (assignments) as set out by the instructor, accompanied by an artist statement.
- Assessed their projects in relation to the stated objectives of the assignment.
- Developed a language suitable for descriptive and critical understandings of their assignments and broader themes related to new media art.
- Participated actively in all group discussions.

Sequence and description of projects

(1) Project One – Modeling

- Introduction to Maya Interface
- Polygon modeling tools and techniques
- NURBS modeling tools and techniques
- Deformers
- ★ Presentation on project one. (Sep. 18, 2014)

(2) Project Two – Texturing & Rigging

- UV texture editor
- Lighting
- Rendering
- Joints
- Skinning tools and techniques (Weight Hammer, Paint Skin Weight Tool, etc.)
- Control Objects and Constraints
- ★ Presentation on project two. (Oct. 23, 2014)

(3) Project Three – Animation

- Animation Timeline and Keyframe
- Principles of Animation (squash and stretch, anticipation, secondary action, etc.)
- Walk Cycles
- Run Cycles
- Character Interaction
- Facial Animation
- ★ Final presentation. (Dec. 11, 2014)

Grading policy

Three projects will be given throughout the semester. It is expected that you will address the assignments in each project creatively and with considerable thought. The class participation and attendance will be worth 30 % of your final semester grade and the exercises and projects will be worth the remaining 70 %.

- Class participation/Attendance = 30%
- Exercises (approx. 10) = 15%
- Project 1 = 15%
- Project 2 = 20%
- Project 3 = 20%

Grades will reflect the students' ability to clearly demonstrate:

- Success in relation to course and assignment objectives.
- Resolution and quality of work understanding of concept and ability to express that understanding.
- Inventiveness and ambition.
- Participation and commitment in all course activities.

Grading Scale

94 – 100 = A (EXCELLENT) exceptional work, pushing the limits of the assignment and challenging yourself, excellent concepts and outstanding use of techniques.

90 – 93 = A-

89 – 87 = B+ (GOOD) work – well done, executed with care and attentiveness; good use of concepts and techniques from class and reading assignments.

86 – 84 = B

83 – 80 = B-

79 – 77 = C+ (SATISFACTORY) average work, assignment guidelines were properly followed, acceptable, and satisfactory achievement.

76 – 74 = C

73 – 70 = C-

69 – 67 = D+ (POOR) work barely meets assignment requirements, no effort or time invested.

60 – 66 = D

below 60 = F (FAILURE), does not meet the minimum requirement. Incomplete work. Please note that it's better to submit something than nothing. Even if you get 30/100 it will still help your grade. Not submitting an assignment will give you a 0.

Class Attendance

It will be important for all students to attend class regularly, and to review the material missed should an absence occur. Up to 3 absences will be accepted unconditionally, but each further absence will cause the attendance grade to be lowered by 20 (100 to 80, etc.). Attendance will be recorded during the first 10 minutes of class. If you should have a medical reason to miss more than the allotted absences, please keep me apprised with notes from your doctor.

ALWAYS BACK UP YOUR WORK

You will need an external hard drive or flash drive at least 10+ GB from which to work from and store your projects. Please remember to backup your files to an additional drive or DVD-r to avoid a tragic loss of your work. Loss of data is not a valid excuse for submitting a project late.

Safety Information

Students in the School of Visual Arts may find themselves working in the shop or in their studios or classrooms using a variety of materials and power and hand held equipment, which may cause injury. Given this possibility, equipment is provided and ventilation systems have been installed that are regularly inspected and maintained to ensure the safety of all students working in classrooms, studios and the shop. Students should use the shop only after having received an orientation in the use of such equipment and when supervised by faculty or shop personnel. Should any injuries occur, in the shop, studios, or classrooms in the School of Visual

Arts please report them to Jerry Bierly, Shop Supervisor, Room 108 – A Visual Arts Building, Phone: 814-865-3962, email: jib7@psu.edu.

Academic Integrity Statement

University Policies and Rules Guidelines states that academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. Academic integrity is a basic guiding principle for all academic activity at The Pennsylvania State University, and all members of the University community are expected to act in accordance with this principle. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts. Academic integrity includes a commitment not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others.

Academic dishonesty includes but is not limited to acts such as cheating on exams or assignments; plagiarizing the words or ideas of another; fabricating information or citations; facilitating acts of academic dishonesty by others; claiming authorship of work done by another person; submitting work completed in previous classes; and/or submitting the same work to multiple classes in which a student is enrolled simultaneously.

Course Schedule

☆Project One – Modeling (Week 1 ~ Week 4)

Week 1 (Aug. 25 ~ Aug. 31)

Introduction to Maya Interface
Manipulation of objects/Tools
Hierarchy UI
Introduction to Modeling
Exercise One: Modeling the Missile Launcher (Part one)

Week 2 (Sep. 1 ~ Sep. 7)

Polygon modeling tools
Modeling History
NURBS modeling tools
Deformers for Modeling
Exercise One: Modeling the Missile Launcher (Part Two)
Exercise Two: Modeling a character (Part one)
© Assignment one: Modeling an object

Week 3 (Sep. 8 ~ Sep. 14)

Exercise Two: Modeling a character (Part Two)
© Assignment two: Modeling a character

Week 4 (Sep. 15 ~ Sep. 21)

Rendering
Work Day

★Presentation of Project One (Sep. 18):

Every student will have 5 minutes to talk about your work. Your Portfolio should consist of (1) 3 images of your assignment one model (2) 2 Images of your assignment two character in front view and side view. (2) 3 images of your character through the perspective views. Additional works (such as character concept design) are very welcome!

After the presentation, you should put all of these pictures with your Maya project files in one folder and compress it into a ZIP file or RAR file, and upload it to the course site for grading. Please name your file by “your name + your student ID”.

☆Project Two – Texturing & Rigging (Week 5 ~ Week 9)

Week 5 (Sep. 22 ~ Sep. 28)

UV Mapping

UV texture editor

Exercise Three: UV Mapping

☉ Assignment Three - UV Mapping

Exercise Four: Texture mapping a character (Part One)

Week 6 (Sep. 29 ~ Oct. 5)

Exercise Four: Texture mapping a character (Part Two)

☉ Assignment Four - Texture mapping your character

Exercise Five: Rigging a character (Part One)

Week 7 (Oct. 6 ~ Oct. 12)

Introduction to Rigging

Joints(Hierarchy, UI, Rotation)

Skinning tools and techniques (Weight Hammer, Paint Skin Weight Tool, etc.)

Connections of Attributes - Control objects (Global Control, Controller, Center of Gravity, etc.)

Constraints

Exercise Five: Rigging a character (Part Two)

☉ Assignment Five: Rigging your character

Week 8 (Oct. 13 ~ Oct. 19)

Dynamic parenting system

Facial Expression (Blend Shapes)

Spline IK system

Exercise Six: Facial Rig

Work Day

Week 9 (Oct. 20 ~ Oct. 26)

Work Day

★ Presentation of Project Two (Oct. 23):

Every student will have 5 minutes to show your work. Your Portfolio should consist of (1) images of your textured assignment four character. (2) A video recording of your assignment five character with controllers on. The video should show how each controller functions on your character.

After the presentation, you should put the images, videos with your Maya project files in one folder and compress it into a ZIP file or RAR file, and upload it to the course site for grading. Please name your file by "your name + your student ID".

☆ Project Three – Animation

(Week 10 ~ Week 16)

Week 10 (Oct. 27 ~ Nov. 2)

Introduction to Animation
Animation Timeline UI
Working with Keys in the Timeline
Curves
Graph Editor UI and editing keys
Animation on a curve

Principles of Animation
Timing and spacing for weight
Timing and spacing for contrast
Beginning pose to pose animation
Exercise Seven: Anticipation and Secondary Action

Week 11 (Nov. 3 ~ Nov. 9)

Exaggeration
Ease in and Ease out
Extremes, in-betweens and breakdowns of character animation
Straight ahead action
Follow through and overlapping action
Secondary action
Squash and Stretch
© Assignment Six: Character Animation

Week 12 (Nov. 10 ~ Nov. 16)

Walk Cycles
Run Cycles
Work day
Exercise Eight: Walk Cycle
Exercise Nine: Run Cycle

Week 13 (Nov. 17 ~ Nov. 23)

Character Interaction
Blend Shapes
Facial Animation
Exercise Ten: Facial Animation
Work day

Week 14 (Nov. 24 ~ Nov. 30)

Break (no classes)

Week 15 (Dec. 1 ~ Dec. 7)

Work day
Rendering

Week 16 (Dec. 8 ~ Dec. 14)

Work day

Rendering

★ Final Presentation (Dec. 11):

Every student will have 8 minutes to show your work. Your Portfolio should consist of (1) your character animation, (2) 3 still images/ screenshots of your animation, (3) Poster (optional).

Portfolio Requirements:

(1) The animation should have at least 30 seconds. (2) The video format should be 'Mp4' or 'Mov'. (3) Soundtrack is optional.

After the presentation, you should put the images, videos with your Maya project files in one folder and compress it into a ZIP file or RAR file, and upload it to the course site for grading. Please name your file by "your name + your student ID".

★ Dec. 11 Final project submission deadline ★