ART265

Core 3 Dimensional Modeling, Or:
HOW I LEARNED TO STOP WORRYING AND LOVE THE MESH

An introduction to using software to create 3D models and computer animations. Students will be given a comprehensive introduction to the various components including modeling, animating, rendering and lighting.

COURSE STRUCTURE
This is an introduction to the fundamental elements of digital design production for animation, conceptual rendering, and physical building. We will go over ways that designers create and use 3d models, interpret imagery, and translate hand-made prototypes. The goal a digital modeler has is to input her or his idea into the information continuum and create a virtual or physical representation of it using industry-standard tools. We will emphasize conceptual and theoretical applications of 3D modeling as well as technical and physical aspects. You will be acquainted with basic animation, prototyping, and production through class workshops, readings, and screenings. Each project will build on the last, and the project will be critiqued in class.

You are expected to gain an understanding of modeling tools and concepts and how they mesh with the research, practice, and ideas that your work is grounded in. Where your personal views and this technical language intersects is the territory in which you will learn to generate unique solutions to virtual and physical design problems. As you improve both your toolbox and your critique, projects will be structured to give you increasing independence in your approach to design.

Topics we will cover:
• Best practices in navigating computer work-flows for 3D Modeling and animation
• How to structure and time line a digital project
• Using 3D computer modeling to produce parts for design or for sculpture - Emerging digital tools
• Understanding the information continuum

Our primary toolbox:
• A Sketchbook
• Adobe Photoshop, Premier Pro, and After Effects
• Autodesk 3DS MAx

COURSE WEBSITE
www.udel.edu/canvas: This will be our course site. This site is how I will introduce materials necessary for success in the course, post announcements, update course schedule, administer quizzes and upload grades. Check it daily.

REQUIRED MATERIALS
NTSC or exFAT formatted external hard drive, minimum Thunderbolt / USB3
Windows-prepared computers in MacLab (work only on these)
Sketchbook
COURSE OBJECTIVES
+ Learn the foundations of our assigned 3D program
+ Develop a standard work flow for organizing creative strategies and reference materials
+ Develop conceptual foundation in visual perception and representation
+ The option to create or 3D print physical models. Students are encouraged to develop new techniques and tools when necessary to specific projects.
+ Master basic animation principles by creating a body of work.

PARTICIPATING and READING
This class is anchored on lecture, demonstration, and discussion. These key aspects will promote your success at physical capture, modeling, and outputting. I expect you to give the same energy to the key aspects as you give to your digital work. Reading will most likely involve contemporary articles from web pages and magazines in the field, but will also include myriad self-researched Online tutorials.

EVALUATION
Grading will be assessed by the following:

Completion and evaluation of assignments: 60%
Each assignment will be evaluated by reviewing the research done in the development of a work (50%) and the final piece presented to the class (50%). You are expected to spend as much time outside of class as necessary to achieve the level of completeness and resolution as the project requires. On the completion date of each project, we will review each other’s work as a class in a group discussion. Presence is mandatory.

Focus and participation during class: 30%
Since this studio course is based solely on lecture, demonstration, and discussion, you cannot succeed if you do not show up. You must understand the material and your focus must be sharp in order to contribute to your fellow classmates. In addition, you will be asked to find your own methods to solving problems posed in the class through Online research, tutorials, or problem solving within the program. Any contribution towards the class and your peers’ knowledge will count towards your participation grade.

Attendance: 10%
Attendance will be noted, however it is the responsibility of the student to come to class, be present, and complete the required work. If I need to make a decision on a grade, I may use your attendance to tip the scale. If you miss a class, it is YOUR responsibility to catch up, your classmates are resources, rely on and help each other.

LATE WORK
Late work will be marked down two thirds of a letter grade (7%) for each week it is late. (‘A’ level work will receive a ‘B+’ when turned in one week late. After two weeks, that ‘A’ level work becomes a ‘B-‘.) Late work may be revised up to the amount that it is penalized, so it is better to turn something in each week rather than nothing at all. For example, the highest grade that you can earn for a project that is one week late is a ‘B+‘. If you fail to turn in an assignment at all then I will not be able to give you a passing grade.

GRADING RUBRIC
A
- completion of all assignments and consistent presence
  - evidence of care and creative solutions in the finished work
  - analytical and observational participation in group discussion
  - attentiveness during class and openness to criticism
B
- completion of all assignment
  - consistent presence
  - evidence of effort given to finished work
  - participation in group critiques
  - attentiveness during class
C
- missing completion of one assignment
  - inconsistent presence or leaving early
  - evidence of effort given to finished work
  - lack of participation in group discussions
D
- missing more than one assignment
  - absent more than four classes
  - lack of effort given to finished work
  - no participation in group discussions
  - comes late and/or leaves class early on a regular basis
EMAIL
Please feel free to email me at any time. I’ll do the best I can to get back to you within 24 hours. Please check the syllabus or assignments before you write to me as I cannot supply respond to requests for information that is already provided.

OTHER RESOURCES and READINGS
In addition to weekly lectures, I will provide you with reading and images to view each week. These are meant to stimulate your creative process and your flexibility as an artist and designer. I expect you to take the same level of care and attention to detail in this requirement as you take in your own work.
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Tentative Schedule

Part 1 — Animating Environments and Concepts in 3Ds Max

Week 1
T 2/6
— Create animation in photoshop - 3, 5, 9, 11, or 15 max
— Export GIF for the web and changing frame rates in Photoshop
— Render standards and importing video frames to layers in Photoshop

Screening: “Diversion” by Hyunmin Lee; “Patterns” by Decay79; Big architects; “Theodore & Rosemary’s Orchard” by Kadavre Exquis; “Mothlight” by Stan Brakhage; “Katachi” by Shugo Tokumaru; “Serpentine Dance” by Lumiere Brothers; “Again” by Nico Gau.

Research: Find a video from an artist on ubuweb.com that you enjoy. We will briefly present a clip from the video alongside a background of the artist / artwork at the beginning of class next week.

E1: GIF Creation

R 2/8
— Review GIF animations and ubuweb selections
— Set project folder every time before you begin or switch computers
— Introduction to basic primitives and tools in 3Ds Max
— Navigating x, y, z axis, orientation, orbit, pan
— How to set up camera, auto keyframe vs. manual keyframe
— Basic render settings

Screening: “Casse-croute” by Burcu & Geoffrey; “My Child is Dreaming” by Mr. Klesha Animation

E2: Create an Abstract, which we will use as something which lets you know that you can animate in 3Ds Max. This should be a finished, 10 second animation using basic shapes and 1 camera. File should be formatted in QuickTime according to the settings you will be provided in class. 100 frames. No sound. Finish your in-class project and upload it to Canvas by Tuesday.

R1: Gaston Bachelard’s The Poetics of Space.

Week 2
T 2/13
— Review Abstracts
— Introduction to extended primitives and changing amount of segments (EditPoly)
— Instance vs. Copy
— Basic scripting in 3Ds Max
— Start with a basic wireframe, then add details (speed your process by working in passes)
— Sun Positioner to create daylight system

P1: Collections - 10 second animation

Screening: “Pheromone” Helmut Breider; “Paradise” - A Contemporary Interpretation of the Garden of Earthly Delights” by Studio Smack; Pat McElnea; “A Single Life” by Job, Joris & Marieke

R 2/15
— Review basic camera work and camera positioning (POV and depth of field)
— Interior lighting in 3Ds Max with free lights (photometric lights vs computer based lighting)
— Working with exterior and interior lighting together - color temperature
— Review basic construction principles, boolean, and compound objects
— 3D Warehouse

**Screening:** Look at match cuts with Maya Deren’s “A Study in Choreography for Camera 1945”; Hito Steyerl; “Circular Breathing” by Gary Hill

**R2:** Walter Bejamin “Work of Art in the Age of Mechanical Reproduction”

**Week3**
**T 2/20**
— Review COllections Animation
— Freeform terrain modeling with soft selection - site specificity
— Advanced render settings and camera settings
— Cameras along a path
— Controlling multiple cameras for one scene - point of view
— Batch rendering

**R3:** Martha Buskirk *The Contingent Object of Contemporary Art*

**R 2/22**
— Particle Systems and physics in 3Ds
— mCloth
— Weather
— Introduction to Particle Editor; resources for building custom scripts within 3DsMAx
— Animate noise

**P2:** Site Intervention. This may be a proposal for a public sculpture or structure or a documentation of a landscape intervention. Build an environment and use a camera along a path to create a 10-20 second walk-through animation. Bring image into Photoshop and create an environment around it

**Week4**
**T 2/27**
— Review Site Intervention Projects
— Material Editor
— Create custom textures in Photoshop
— UVW Mapping and the Gizmo
— z-Depth and other elements which can be rendered individually for better compositing

**Screening:** Hito Steyerl “How to Be Invisible”; Kentridge; “Blind Spot” and “Circular Breathing” by Gary Hill; “Adam” by Evelyn Jane Ross; “Blockchain” Walter gropius space caviar; “The Infinite Now” (cinematographs from stills) Armand Dijcks

**P3:** Intersection

**R4:** *Understanding Comics*, chapters 2 & 4.

**R 3/1**
— Populate (Possibly not on lab computers)
— Billboard Objects and follow camera scripts
— Develop tools within 3Ds
— In-class workshop

**Screening:** Craig Reynolds Evolutionary Computation and Camouflage

**Part 2: Beginning animation and programming camera work**

**Week5**
**T 3/6**
— Review intersection projects
— Build animation elements in Illustrator (blend modes; separate layers to animation frames)

Professor Morgan Hamilton, morgham@udel.edu, Office hours by appointment only, Classes meet T/R 12:30-3 pm
— Importing SVG elements into AfterEffects (composition vs. footage)
— Create a fade using Opacity keyframes in the timeline
— Basic render settings in AfterEffects (screening vs web settings; animation vs video; USA vs Europe)

P4: Create a 15 second animation in AfterEffects with or without sound. Please do not use music. Record your own sound.

Screening: “Synchromy” the making of by Norman Maclaren, “Video Ravings” by Cory Archangel, and “Lorn - Anvil” by Geriko, “Box” by Bot & Dolly; “How to be Rad” by Adam Black

R5: Seth Price Dispersion

R 3/8
— Rotoscoping in AfterEffects
— Create masks on top of solids
— Move basic shapes by key framing position and scale
— Persistence of vision, beta movement and phi phenomenon

Screening: Oliver Herring; Matthew Barney + Bjork; “It’s where the world ends” Indian wells/ Yoshi Sodekoa; “Mr. Kat and Friends Presents: The enlightenment of Cosmic Panda” Le Cube; “Magnitude Rituals” Pnghun Lee

Week6
T 3/13
— Review AfterEffects Animations
— Camera tracking in AfterEffects
— 3Ds objects in After Effects
— Useful effects - dust n’ scratches, curves, color correction
— Primary and secondary animation (the bouncing ball theory)
— Use curve editor to apply and delay secondary movements that are directed by the primary animation

R 3/15
— Ways to record sound: Cell phone, captured from web, archives, mics and recorders
— Animating stereoscopic pairs
— Sync sound; sound timing
— naturalistic sound vs music vs voice
— adding sound to your animation in PremierPro

Screening: Ken Jacobs 2007 Film Slavery; Scott Starck’s “Angel Beach”; Terry Adkins “John Brown Excerpt”; “SHHH! Jack Sachs x Tate Britain”; Tom Sacks; “Mess on a Mission” Liars; Ann Hamilton “Event of the Thread”

P5: Installation / Projection

Part 3 — Off of the screen and into the world

Week7
T 3/20
— Review Installation / Projection Projects (email ahead if site specific)

R 3/22
— Points > Line > plane > shapes
— 3d to 2d to 3d - learn to unroll, print, and assemble a 3d model from a single sheet of paper
— Modular objects vs. single object design

R6: Donna Harraway Cyborg Manifesto
P6: Unwrap. Texture mapping; 2D to 3D to 2D; Photoshop textures; hand vs. machine

Week8

SPRING BREAK

Professor Morgan Hamilton, morgham@udel.edu, Office hours by appointment only, Classes meet T/R 12:30-3 pm
Week 9
T 4/3
— Review Unwrapping Project
— revolve surfaces along an axis
— sweet, loft, extrude, slice
— boolean functions

Research: MOMA Design and the Elastic Mind

R 4/5
— Model a simple mechanical part
— Prepare files for CNC milling 3D printing, laser cutting and water jet cutting

Screening: “Input / output” Terro Timely; “Vicious Cycle” Michael Merczewski; “Center circle 3 week gruyun”; Tim Portlock; Andrew B Meyers

R7: Dunne and Raby’s Design Noir; Thwaites The Toaster Project
P7: Model a part to scale in 3ds Max using parent child relationships

Week 10
T 4/10
— Review mechanical part projects
— Freeform modeling in 3Ds
— Scanning using Autodesk ReCap

Screening: Dezeen 3D Scan Apparel Design, PBWC Architects 3D Site Scan; Munari’s Design Is Art

P8: Scan a fruit or vegetable and clean up the mesh

R 4/12
— Review scanned fruit
— Materials
— UV Mapping and 3D printing

Screening: “Feral” by Daniel Soura

P9: Place a UV map on your fruit scans which changes its meaning

Part 4 — Putting It All Together

Week 11
T 4/17
— Review UV map fruit
— Animation review in 3Ds Max

Screening: “Eating Machine” Otok

R 4/19
— Advanced keyframing in 3Ds and AfterEffects
— Codecs and timecodes

Screening: “L’ille Noire” Nino Christen; “Pombo Loves You”; “Johnny Express”

P10: Animate your new fruit with found footage

Week 12
T 4/24
— Review in-class animations
— Introduce Final Project

Screening: Anri Sala “Ravel Unravel”; Krystof Wodzicko; Alex Da Corte “Eastern Sports”

P11: Bring research supporting your final project to class on Wednesday. Feel free to use any of the tools that we have covered so far, or your may build your own tools. Use this project to respond to a critical personal, public, environmental or interactive condition. Use this project to speak critically about something that you genuinely care about. Be able to explain your project briefly in two sentences as
well as in one paragraph or longer. Draw out a storyboard or use a 3D wireframe to show how the project / animation / object / installation will be built.

R 4/26
— Bring your project proposal to class today. If your proposal is well prepared with supporting documentation and a time line for completion you may begin working on your project.

Week13
T 5/1
— First Draft/ Wireframe of final project due
— In-class workshop

R 5/3
— One on one consultation about final projects
— In-class workshop

Week14
T 5/8
— Last-minute questions regarding final submission

Screening: “Motion Makes a Masochist” by Dev; robot beats captcha)

R 5/10
— Final Class, review project by volunteer