//3D Animation & Visual Effects

Redefine Reality with Imagination!

Step 6—3D Modeler

Enhanced Modeling Techniques

Activity Sheet

Continue learning advanced skills as a 3D Modeler. This portion of the training will focus on sculpting. Yoda . . . what would Star Wars have been without him? Consider other great characters with "personality" and you'll notice they often include significant, well-defined, detail. Likewise, if you are modeling for science and/or education, it is vital to include an accurate, detailed representation of your subject. Sometimes, it's all in the details . . .

GET THE JOB! IN THIS PHASE, YOU WILL master the following skills:

Production Standards—Modeling:

Adopts habits to support industry-standard modeling requirements and solve 3D Modeling challenges. These standards can be applied to real-world unpredictable situations and include: Model requirements, complexity, media format and delivery output, and preparation of geometry for scultping.

Surface Texture Techniques:

Applies surface material and techniques to models. This includes: texturing, UVs--layout, unwrapping, manipulating; create/assign textures to polygons; materials, and mental ray.

Sculpting

Adopts habits and techniques to support industry standards for sculpting. These techniques can be applied to real-world unpredictable situations and include: Symmetry, asymmetry, additive/subtractive sculpting/ creating/using alphas, adding new geometry; brushes; move/reposition mesh; polygon management based on hardware, scene mgmt of multiple pieces of geometry, topology flow and manipulation, and exporting.

A detailed checklist of skills you may be required demonstrate is provided on the following page.

Prepare with Purpose | Pursue | Persist | Polish | Produce | Problem-Solve | Perform with Promise

FRANCIS TUTTLE TECHNOLOGY CENTER

Competencies Checklist:

Demonstrate the skills you need to get the job!

Production Standards—Modeling Techniques:

- Adopts habits to support industry-standard modeling requirements and solve 3D Modeling challenges. These standards can be applied to real-world unpredictable situations and include: Model requirements, complexity, media format and delivery output, and preparation of geometry for sculpting.
  - Determine model requirements for story—complexity details, etc.
  - Convert real objects to models using Maya 3D software.
  - Model complex graphics, using independent judgment, creativity, and computer equipment.
  - Construct objects or characters that appear lifelike by manipulating light, color, texture, shadow, and transparency and/or manipulating static images to give the illusion of motion using visual effects through Maya 3D software.
  - Show increased reality by using perspective and receding planes.
  - Import various types of geometry.
  - Demonstrate working knowledge of how to activate 3rd party plug-ins.
  - Prepare geometry for sculpting.
  - Combine technical skills, troubleshooting techniques, and creativity to construct a unique model that provides a solution for a client.
  - Demonstrate lighting techniques for project.
  - Render a turntable view.
  - Export models in a variety of formats for various delivery options. (obj & FBX)

Surface Texture Techniques

- Applies surface material and techniques to models. This includes: texturing, UVs--layout, unwrapping, manipulating; create/assign textures to polygons; materials, mental ray
  - Manipulate UVs within the UV Texture Editor—layout, unwrapping, etc.
  - Use the Planar Map, Cylindrical Map, Automatic Maps, etc., as a method of creating a UV layout.
  - Create and assign textures to polygons: Diffuse Map, UV snapshot, texture maps, assign maps to shader, etc.
  - Produce and work with different types of materials, placing secondary textures, as required.
  - Manipulate curves/splines.
  - Apply surface materials and/or textures to models.
    - Create a Diffuse Map
    - Save UV snapshot
    - Edit texture maps (Specular, Bump, Ambient Occlusion)
  - Use Mental Ray to create an Ambient Occlusion map; create and apply displacements maps; bake textures.

Sculpting

- Adopt habits and techniques to support industry standards for sculpting. These techniques can be applied to real-world unpredictable situations and include: Symmetry, asymmetry, additive/subtractive sculpting/ creating/using alphas, adding new geometry; brushes; move/reposition mesh; polygon management based on hardware, scene management of multiple pieces of geometry, topology flow and manipulation, and exporting.
    - Determine if model needs sculpting based off the requirements.
    - Integrate objects created in Maya within the ZBrush application for enhancement.
    - Model and enhance complex graphics, using independent judgment, creativity, and computer equipment.
    - Make objects or characters appear lifelike by manipulating light, color, texture, shadow, and transparency and/or by manipulating static images to give the illusion of motion using visual effects through the integration of Maya 3D and ZBrush software.
    - Develop intermediate modeling, sculpting, texturing, painting, and digital artistry skills.
    - Utilize UV mapping techniques to define and apply textures to models.
    - Demonstrate proficiency in working with ZBrush software.
    - Select color and textures to enhance 3D graphics and/or special effects.
    - Prepare model for export into appropriate software.
    - Demonstrate sculpting techniques:
        - Symmetry/Asymmetry
        - Additive/Subtractive sculpting
        - Creating/Using Alphas
        - Adding new pieces of geometry
        - Understanding differences of brushes
        - Moving and repositioning mesh
    - Polygon management based on hardware
    - Scene management of multiple pieces of geometry
    - Understand topology flow and how to manipulate it.
    - Export out of sculpting software to host application.

Resources and Skill Mastery

College Credit: TECH 2003 DM23 Enhanced Modeling Techniques

Certification: ODCTE 3D Modeler

What

Create and fine-tune models with sculpting, texturing and shaping techniques and tools designed to enhance your artistic skills.

Objective:

Students will focus on developing intermediate modeling, sculpting, texturing, painting, and digital artistry skills as they utilize UV mapping techniques to define and apply textures to models.

Why

Yoda . . . what would Star Wars have been without him? Consider other great characters with "personality" and you'll notice they often include significant, well-defined, detail. Likewise, if you are modeling for science and/or education, it is vital to include an accurate, detailed representation of your subject. Sometimes, it's all in the details . . .

How

Instruction:

ZBrush/Integration

Creative Blitz Portfolio Challenge

Apply your enhanced modeling techniques to design an Alien character for a new sci-fi film OR Choice*
*(If choice, must be pre-approved by instructor)

Project Guidelines—READ & PREPARE before starting

Creative Brief: Alien OR Sand Monster

Client: Dana Myers

Industry: Entertainment

Project Goals: Develop a profile, concept art, prototype, and a model for an alien that will be starring in an up-coming sci-fi movie.

Objectives:
- Alien should be unique, completely different from anything created previously.
- Alien should have personality, appeal, and charm

Target Market:
Gender: M & F
Age: 10+; must be school and Mrs. Myers appropriate ☺
Additional Info: Use all of your imagination as you design and model your vision for an Alien to be featured in an upcoming sci-fi film.

Message:
Who is the next Yoda?

Initial reference ideas:
- Research!
- Develop concept art, prototypes
- Develop a profile to represent your character; include your vision and rationale for your character representation in the model

Technical requirements listed on following page.

Technical requirements:

- ❑ Before starting, document your plan for completion of this project in Basecamp. Include dates, phases, etc.
- ❑ Visit course page on class site to check out additional resources & tools.
- ❑ Deadline: 30 hours
- ❑ Write a character **profile**; include your vision for the character and the rationale for decisions made during the process. (No more than 1 page; must be grammatically correct. See class site for examples.)
- ❑ Design an appropriate background scene for model. (May be 2D)
- ❑ As you **research** ideas, develop **concept art** and **prototypes**.
- ❑ Review rubric prior to starting for quality indicators for success
- ❑ Model must be shown at different **angles** and **shots** and incorporated into a **turntable.** Be sure the shots give the viewer time to see them before moving to another angle/view. Consider the following shots:
  - Wide/Establishing Shot
  - Close-Up Shot
  - Pan OR Zoom, use for emphasis, but sparingly
  - Extreme Close-Up Shot(s)
  - Closing Shot
- ❑ Use appropriate **color**, **materials**, **lighting**, **textures**, and **rendering** techniques to complement your model.
- ❑ Include as much **detail** as possible—don't cover up your alien model with a space suit.
- ❑ The alien should appear **inviting**--think Shrek, E.T., or Yoda. It needs to have "**personality**" and **charm**. (Refer to ***"How to Create Characters with Personality"*** text.) The public needs to make a connection with this new species. The alien should not be something that will scare people or depict violence.
- ❑ May include **audio** (Can be background music—must be royalty free; or recorded voice introduction, or both. Refer to freeplaymusic.com for background music selections.)
- ❑ **5 Peer Reviews** completed *immediately after prototypes, **before** starting final design*. (ask instructor to assign peers, if needed.)
- ❑ Use **IShowU** and/or **Grab** to document development as well as advanced techniques used to develop alien. Save often and save **versions**; consider using these versions in IShowU documentation. This will enable you to show **various stages of development**, the **wireframe**, and progression of your model.
- ❑ Compile any sketches and prototypes you create as well as a storyboard of angles; consider incorporating these into a turntable.
- ❑ **Publish** modeling, as completed in phases, to Behance, using the Work in Progress section to communicate regularly with your client to keep them updated. Final should include various model views, turntable, reflection. **Calculate** the approximate costs associated with printing your 3D model. You will need to calculate the total cubic inches. The formula is Length X Width X Height. For more information, http://www.gradeway.com/lessons/math/findvolume3d.aspx. The printer software will also approximate the costs, so you can compare your estimate.
- ❑ Prior to publishing, print & complete **self-evaluation** on rubric and submit **reflection**.
- ❑ Use **Grab** to get/save screen shots of the following items:
  - Good **file naming** scheme for your model parts.
  - Use Heads Up Display to provide a screen shot showing the **number of polygons, faces**, etc., of your model.
  - Wireframe
  - **Grouping/Parenting** as shown in Outliner.
  - **Hypershade** assignments.
  - Show the **wireframe** topology; clean it up, if necessary.

This is for a **Quack** award and will be featured in your portfolio to validate your skills. **Do your best ☺**

You are responsible for reviewing the rubric prior to beginning for additional requirements, and to be sure you earn all your points. During production, problem-solve and refine your design as needed to **submit an awesome project you will be proud of showcasing in your portfolio.**

Quack Award

It's time to do your very best work—this project will be featured in the Quack Award entries ☺

Design an Alien OR a Sand Monster

Refer to the rubric and project guidelines for quality indicators.

NAME:

SHOT NUMBER:

SHOT TYPE:

CAMERA MOVEMENT:

ACTION:

AUDIO:

SHOT NUMBER:

SHOT TYPE:

CAMERA MOVEMENT:

ACTION:

AUDIO:

SHOT NUMBER:

SHOT TYPE:

CAMERA MOVEMENT:

ACTION:

AUDIO:

SHOT NUMBER:

SHOT TYPE:

CAMERA MOVEMENT:

ACTION:

AUDIO:

Alternate Storyboard Template

Due Date: _____

NOTES/SHOTS	VIDEO/ILLUSTRATION	DOCUMENTED RESEARCH

Instructor Approval/Date: _____

Peer review

Prior to beginning, ask the instructor to assign a classmate to conduct periodic peer reviews.

Overview

Revision is an important part of the design process. In addition to conducting review and redesign cycles personally and with your client, using peer review can also be beneficial to your project. Peer review occurs in many professional environments, and it is an essential skill to starting learning.

When giving a peer review, be sure to **make both positive and negative points**. Give critiques as suggestions, not commands. When receiving peer review, do not feel disenchanted or think you did a bad job based on one review. Every review is different and what one person may not approve, the next person may find exemplary.

Once you have a draft developed of your project, have your assigned classmate read this document and review your work to give suggestions. They should also review it again before you present your final project to the instructor. They should use the Final Evaluation Grade Rubric form as a guide, and the form on the following page for comments.

Evaluatee:

Process for presenting work for peer review

• Ask the instructor to assign a peer for review purposes—you want a different, objective perspective
• When presenting your work for a peer review, state the purpose, audience, and goals of your project and point out any concerns you have.
• After someone else reviews your work, your first response should be to reiterate their suggestions, make sure you understand their comments, and ask for additional clarification, if needed.
• To conclude, have the student summarize the suggestions on the back side of this form, and start revising, as needed.

Evaluator:

Guidelines for giving comments and suggestions

• Before making any comments, review the goals of the project and then the entire project, making sure you understand the student's intentions.
• Point out the strengths as well as the weaknesses of the project (composition, storyboard, research, design, technical skills, timing, so on).
• Offer suggestions, not commands. For instance, do not say "You should do this...." Instead, use "I" statements: "I see that..." or "I'm confused about...."
• Be respectful and considerate of your peer's feelings. Do not say or write anything you wouldn't want to hear about yourself. There is no reason to be rude.
• Make sure your comments are clear and specific so your peer knows what you are referring to. Give specific examples and point to techniques, examples, script writing, and so on to make your point. (Comments such as "This is unclear" or "This is too vague" are too general to be helpful.
Rather, make a comment such as "I'm confused by this scene because it seems out of place.")
• When you are writing your comments, reread them before giving them to your peer. **Make a list of at least 3 positive comments and a list of at least 3 suggested improvements**. Make sure your comments make sense and are easy to follow.

Assessment

3D Alien OR Choice Enhanced 3D Model Challenge					
Category	**Good to Excellent 3 or 4**	**Satisfactory 2**	**Needs Improvement 1**	**Points Received** Self	Teacher
Prototypes, Sketches, Research, Image Planes	At least **three prototypes** developed. **Sketches** and **versions** show progression of design. Selection process, including colors and textures, were explained. Image Planes created, utilized in design.	Only two prototypes were developed and shared with instructor. and met. Image Planes utilized.	Only one prototype developed. Image Plans may not have been utilized.		
Profile	Was grammatically correct; did not exceed one page. ○ Developed from research following prompt ○ Goals and artistic vision developed for scene/model ○ Provides rationale for submission ○ Portrays personality, era, appropriate details	Was grammatically correct; did not exceed one page. May have been missing a component.	Grammar required correction and/or was too long or too brief. May have been missing more than one component.		
Length, Camera shots, Angles, Message, Timing Audio	Model presented in **"turntable"** fashion of different **angles** and included **prototypes, development, wireframe**, **shaded**, **textured**, and **lighted** modes—all **labeled** with appropriate **viewing time**. Shot Suggestions: ○ Wide/Establishing Shot ○ Close-Up Shot ○ Pan OR Zoom, use for emphasis, but sparingly ○ Extreme Close-Up Shot(s) ○ Closing Shot Royalty-free **audio** was clear and appropriate.	Model not presented in "turntable" style with different angles. Stages of development and/or missing requirements, and/or timing not appropriate. Audio needed improvements.	No consideration given to message, camera angles, shots, or modes. Timing needed improvement. Audio not used or not royalty-free.		
Grab Screen Shots; file-naming conventions	Documented **file naming scheme** for model parts, filename: dmyersmodel. Showed **number of polygons, faces**, etc. **Grouping/Parenting** shown in Outliner. **Hypershade** assignments. Showed the **wireframe topology**; cleaned it up.	Most items provided using Grab.	Grab not utilized to provide evidence of items listed.		
Accuracy, Details, Quality, Realistic Modeling	Model has been **accurately** designed, includes exceptional **detail**, and follows project guidelines. Materials, lighting and finishes appear natural and **realistic for theme**.	Model was accurately designed with average detail, and followed project guidelines. Most of materials, lighting, and finishes appear natural and realistic.	No consideration given to detail, accuracy, or realistic finishes.		
Originality	Model shows significant evidence of **originality** and inventiveness and is unique. Majority of content and ideas are fresh, original, and inventive. No **copyright** laws violated.	Model shows evidence of some originality; may resemble current icon of existing business or product. Model is not unique enough to provide differentiation.	Model is copied or very closely resembles current icon for existing business or product. May have violated copyright laws.		

Reflection and Self-Evaluation	Reflection/self-evaluation completed and submitted ***prior*** to evaluation. Reflection was **grammatically correct**, used **paragraphs**, answered all **questions**, and was appropriate to share with potential employer. Links to resources used were shared and explanation of why resource was helpful provided.	Reflection and self-evaluation submitted prior to evaluation. Reflection had a few errors, or some answers were missing.	Reflection and/or self-evaluation not submitted prior to evaluation; and/or reflection lacking information or required correction.		
Project management: Updates to project and Behance. Communications with client regarding achievements and progress**.**	Project was thoroughly planned & documented before starting. Weekly updates were published to Behance and Basecamp. Design process and techniques were documented using Grab and/or IShowU, Multiple versions of work were saved. Client was updated weekly regarding progress and achievements.	Project was planned before starting. A few updates were published to Behance and Basecamp. Client was familiar with progress and achievements.	No evidence project was planned before starting. Client was unfamiliar with progress and achievements.		
Peer Review and Problem-Solving	Thorough peer review completed by assigned mentor; revisions made based upon peer suggestions and self-evaluation. Student took initiative in problem-solving and correcting as needed, and was able to explain revision and problem-solving process.	Peer review completed; revisions made based upon peer suggestions and self-evaluation. Problem-solving skills need improvement and/or student couldn't explain problem-solving	Peer review lacking; and/or design lacked revisions for improvements; and/or there was a lack of problem-solving.		
Target Market; Branding, Marketing; Collaboration	Model is **unique**, age appropriate, and depicts the **intent** of the client. Turntable was engaging and provided sufficient product details. Community forums utilized for problem-solving and/or review of work; links to resources were shared with client and peers, including an explanation of their value.	Design is unique, age appropriate, and integrated most of client requests. Additional details at could have improved promo. Links to resources were shared, including an explanation of their value.	Model did not meet all objectives and/or there was no collaboration regarding problem-solving or sharing resources.		
Effective Use of Time; Pride and Quality of Work **Established Delivery Date:** _____ **Actual Delivery Date:** _____	Design was not rushed, and was also completed on time. Time was taken to critique design and make improvements so that final version represents student's best work. Design submitted in a timely manner, according to guidelines. All products submitted (reflection, video, and design,) are at a high level of quality, ready for portfolio.	Design was rushed and/or not completed on time. Design was average and could have been improved prior to publishing. Most products submitted were at an average level of quality, but appropriate for portfolio.	Improvements required, but not made prior to publishing. Design was rushed when more time would have resulted in improvements. Some products needed improvements or were lacking.		
Modeling Techniques, Student Understanding, Scale	3D techniques employed exceeded a basic skill level. Student could compare techniques used to skills acquired during instruction; explanation was thorough, and demonstrated understanding. Scaled appropriately.	Modeling techniques were basic when more advanced techniques would have improved, or student could not compare skills or give explanation.	More than one item in this category was not met.		
Creative Artistry, Entertainment Value	Model is very **creative** and appealing. Good design principles have been applied and "**personality**" is evident.	Model is average; Good design principles applied and "personality" is neutral.	Model is not appealing, has no personality.		
			52 Points Possible: Total Points Earned:		

Technical Competencies:

4 - Skilled; 3 - Moderately Skilled; 2 - Limited Skill; 1 - No Exposure

Skill	Competency Rating
Production Standards—Modeling Techniques Create polygon models, subdivision surface models, NURBS models, conversion to/from polygon, subdivision, and NURBS; normals, topology. ○ Import various types of geometry. ○ Demonstrate working knowledge of how to activate 3rd party plug-ins. ○ Prepare geometry for sculpting. ○ Render a turntable view. ○ Export models in a variety of formats for various delivery options.	
Sculpting ○ Determine if model needs sculpting based off the requirements. ○ Integrate objects created in Maya within the ZBrush application for enhancement. ○ Demonstrate techniques for making objects or characters appear lifelike by manipulating light, color, texture, shadow, and transparency and/or by manipulating static images to give the illusion of motion using visual effects through the integration of Maya 3D and ZBrush software. ○ Demonstrate intermediate modeling, sculpting, texturing, painting, and digit artistry techniques. ○ Utilize UV mapping techniques to define and apply textures to models. ○ Prepare model for export into appropriate software. ○ Demonstrate sculpting techniques: ▪ Symmetry/Assemetry ▪ Additive/Subtractive sculpting ▪ Creating/Using Alphas ▪ Adding new pieces of geometry ▪ Understanding differences of brushes ▪ Moving and repositioning mesh ○ Export out of sculpting software to host application.	
Surface Texture Techniques ○ Use the Planar Map, Cylindrical Map, Automatic Maps, etc., as a method of creating a UV layout. ○ Create and assign textures to polygons: Diffuse Map, UV snapshot, texture maps, assign maps to shader, etc. ○ Produce and work with different types of materials, placing secondary textures, as required. ○ Manipulate curves/splines. ○ Apply surface materials and/or textures to models. ○ Use Mental Ray to create an Ambient Occlusion map; create and apply displacements maps; bake textures.	
Performance Test/3D Modeler Test preps (2)/DT Test Critique/analyze completed results to determine if objectives are achieved. (1 point each)	
Pull up Sculpting a Realistic Elephant in ZBrush—what did you do/learn?	
Pull up Creating an Aged Character and Artifacts in ZBrush and Maya—what did you do/learn?	
Week 6 Take Charge! Pull up your completed projects—what did you do/learn?	
Demonstrate four unique things you learned not on this list.	
27 points	

3D Modeler Skills and Competencies

4 - Skilled: Consistently meets or exceeds expectations and can perform independently
3 - Moderately Skilled: Meets expectations but may need assistance
2 - Limited Skill: Expectations covered, will need assistance or additional training
1 - No Exposure or Not Observed

Using the scale above, evaluate yourself on the following:

_____ **Graphic Design**

_____ **2D Animation**

_____ **3D Modeling, Sculpting & Texturing**

_____ **3D Animation, Rigging & Dynamics**

_____ **Motion Graphics**

_____ **Visual Design & Planning**

- Create an emotional connection to the story's theme using a rich imagination, a strong sense of appeal, color, design, composition, and the versatility to conceptualize visually in a variety of techniques and styles.
- Possess exceptional storyboarding techniques that inspire the imagination and result in the development of characters with personality and appeal, captivating environments and settings, and great plots.
- Explore all possible options for creating the look and appeal of a character, setting, environment, and/or props.
- Model objects that fulfill project goals and with appropriate personality. Create the materials, textures, and geometric instances that defined the look and appeal of 3D characters, environments, and props.
- Create an emotion connection
- Strong ability to model and texture hard surface/rigid objects within a range of styles, (painterly to realistic).
- Build complex 3D models including organic characters and articulated set and prop models.
- Create and assign textures; sculpt geometry as needed to fulfill goals; Manipulate UVs.

_____ **Artistry & Imagination**

- Translate story ideas into visual sequences to convey the essence of storyline, scene structure, character emotion, and action.
- Create entertaining and visually stimulating new environments through visual cues and artistic expression.
- Bring memorable characters to life; create exciting and believable worlds that inspire and entertain audiences around the world.
- Possess a superior eye for light, shade, color, and detail in creating texture maps and models.
- Utilize an exceptional understanding of anatomy, form, shape, structure, and silhouette in regard to modeling.
- Demonstrate exceptional critical thinking in image deconstruction and advanced artistic skills/abilities in CG/traditional artwork.
- Work with a team of artists to interpret designs, and build and refine models for productions.

_____ **Managing & Problem-Solving**

- Consistently exhibit self-motivation, good communication and creative problem-solving skills, and a LEGENDARY team-player attitude. Must be able to conduct one's self accordingly in a professional setting. Demonstrate PASSION for learning and expanding knowledge of 3D skills, techniques and tools.

Average Rating:	