

New Course Request

Indiana University

Indianapolis _____ Campus

Check Appropriate Boxes: Undergraduate credit Graduate credit Professional credit

1. School/Division Informatics 2. Academic Subject Code NEWM-N
3. Course Number 342 (must be cleared with University Enrollment Services) 4. Instructor Clint Koch
5. Course Title 3D Animation

Recommended Abbreviation (Optional) _____
(Limited to 32 Characters including spaces)

6. First time this course is to be offered (Semester/Year): Fall 2010

7. Credit Hours: Fixed at 3 or Variable from _____ to _____

8. Is this course to be graded S-F (only)? Yes _____ No

9. Is variable title approval being requested? Yes No

10. Course description (not to exceed 50 words) for Bulletin publication: P: N243. Introduction to 3D computer graphic animation for students interested in producing animations for product design, gaming, entertainment, marketing, training, and simulation. Topics include environment design, modeling, motion studies, camera movement, and composition.

11. Lecture Contact Hours: Fixed at 3 or Variable from _____ to _____

12. Non-Lecture Contact Hours: Fixed at 0 or Variable from _____ to _____

13. Estimated enrollment: 25 of which 0 percent are expected to be graduate students.

14. Frequency of scheduling: F/S Will this course be required for majors? _____

15. Justification for new course: Redesign of New Media Curriculum

16. Are the necessary reading materials currently available in the appropriate library? Yes

17. Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.

18. If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.

19. A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by: M. Pauline Behr Date 6/30/2009
Department Chairman/Division Director

Approved by: [Signature] Date 1 July 2009
DÉAN

Date _____
Dean of Graduate School (when required)

Date _____
Chancellor/Vice-President

Date _____
University Enrollment Services

After School/Division approval, forward the last copy (without attachments) to University Enrollment Services for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.

N342
3D Animation

3 credit hours

INSTRUCTOR: Clinton Koch, and others

COURSE DESCRIPTION

Introduction to 3D computer graphic animation for students interested in producing animations for product design, gaming, entertainment, marketing, training, and simulation. Topics include environment design, modeling, motion studies, camera movement, and composition.

PREREQUISITE

N243

REQUIRED TEXTBOOKS

Learning Autodesk Maya 2008, the Modeling and Animation Handbook, Autodesk Maya Press, Sybex, 2007.

COURSE OUTCOMES

Students will develop a concept from a completed storyboard in one animation production from start to finish. Their work will be storyboarded and a technological and conceptual paper will be written before production begins on respective projects. Students will gain an understanding in the three dimensional fundamentals of modeling, texturing, lighting, animation, and compositing. Each student will take their learned techniques and apply them in a production that can encompass a wide range of animations: scientific visualization, architectural flythrough, complex modeling structure, and interiors and exteriors.

CLASS MEETING AGENDA

- Pre-class readings: Class readings are to be completed before the start of each class session.
- Subject matter/topics covered: Class lectures will focus on the five aspects of 3D Animation: Modeling, Animation, Texturing, Lighting, and Rendering/Compositing Passes. We will cover the material by examining the 3D process of application and then using the respective software in developing the aforementioned process.
Ex. Topic: Modeling
Modeling Process: Lofting
3D Explanation: Using circular curves we can select each in progressive order and loft a surface shape along their circumference.
Maya setup Demo with Instructor: Design 1 circle curve (splines tab) and 1 path curve.
Select the path curve and choose loft in compound objects.
- Goals and Objectives of each class: In each class session, I will lecture on a concept and show you the fundamentals of the respective subject. I will then let you practice the concept on one of the computers in the lab or work on upcoming project deadlines. Feel free to ask me questions. After lectures I will move around the class for 1 on 1 with students. Some class sessions will be time for you to work on your projects.

WEEKLY SCHEDULE

Week 1

- Introduction to class: syllabus

- 3D overview: 2D and 3D animation and shading, Softwares, Gaming and Film, Visualizations, Simulations, components of 3D, Storyboarding/Planning

View prior student projects and student goals and objectives for this class

Discuss peripherals acquisition schedule and how that will be accomplished

Lecture: Maya Interface

- Understanding that the Interface is designed for efficiency. Many panels are duplicates placed in different regions of the interface for ease of use.
- Tools, Viewports, Hotkeys, navigation controls, Timeline, Outliner, Hypergraph
- Discuss main toolbar and icons
- List objects, schematic view, track view, animation playback controls, Layers Editor
- Storyboard setup, drawing and sketching, papers, planning

Week 2

Customization Demo – if you want to feel like you are controlling this package you’ll want to customize to your strengths and to add efficiency on items you use a lot

Beginning of interior/industrial design demo: We will in class create an architectural structure, complex model, texture, and light in a three week span.

- Overview of procedures used in Demo

Lecture: Spline to Surface Modeling

Efficient modeling with profile lines.

Reference Planes – Setting up an alpha channel for onion skin lines

Industrial Design Demo (Modeling) Continued

Week 3

Interface continued

- Overview of procedures used in Demo

Polygon Modeling –splines Revolving, lofting, beveling, extruding, etc.

Demo of Modeling – lathing and lofting organic shapes exercises

Industrial Design Demo (Modeling) Continued

Week 4

Overview of procedures used in Demo

Lecture: Polygon Box Modeling–edit poly vs. edit mesh

Concepts of polygon modeling: cutting, slicing new segments, merging vertices, chamfer, attaching, detaching, efficiency, and detail oriented modeling; Booleans

Industrial Design Demo (Modeling) Continued

Week 5

Overview of procedures used in Demo

- Lecture: Modifiers

- Lattice, Optimize, Bend, Squash, Displace etc.

- Organizing your Modifiers for efficiency and optimal modeling and texturing

- Compound objects Morphing,

Scatter, etc.

- Duplication –Copy, Instance, and Reference

Industrial Design Demo (Modeling) Continued and Finished

Project #1 Handout and Discussion: Modeling, texturing, and lighting for detail and realism.

Choose a type of environment (industrial[interior or exterior]/natural [forest, underwater, etc.] to create. Look at prior coursework and discuss ideas and scope of project. First project must be used in Final course project. (Individual)*

Week 6

Overview of procedures used in Demo

Lecture: Lighting the Interior Demo

Defining the lighting setup for different settings: differences between industrial and environmental lighting, global lighting and surface lighting

- Cinematography Lighting: Key, Fill, and Backlights, Key to Fill Ratios, and adding color to lights

- Types of Lights, Shadows, Exclude/Include Lists

Global Lighting, HDRI

Setting Mood, Depth, and Emotion in your scenes.

Using fog lights for depth and atmosphere

Final Gather, Global Illumination, HDRI lighting setups overviewed and demoed
Industrial Design Demo (Lighting Setups for Daytime and Nighttime) Continued
Project 1 Proposal, Sketch Set, and morgue set are due
◦ 1 on 1 time with instructor

Week 7

Overview of procedures used in Demo

• Lecture: Texturing and Material Editor

- Choosing the correct shader for your surfaces; Shaders alone should look good in renders without textures
 - shaders, highlights, patterns and mapping, procedurals, reflections (raytrace, flat mirror), bump mapping, and blending and Composite mapping, UVW Map Modifiers, Mix mapping
- In class demo: glass, metal: chrome, xray atmosphere (falloff)

Industrial Design Demo (Lighting Setups for Daytime and Nighttime) Continued and Finished

Week 8

Overview of procedures used in Demo

Creating photorealistic textures in Photoshop Demo; Creating Realistic Objects –Rusted Metal Demos

UV Texture Mapping: using checkerboards for mapping

- Using a 2D image editor for developing texturing skill sets
- Unwrapping UV maps for 2D image editing
- Subobject mapping

Industrial Design Demo (Texturing) Continued and Completion of Demo

Week 9

New demo begun on Character modeling, texturing, and lighting

Placing Objects Seamlessly into Live Action Footage

• Lecture: Working with Cameras

- Point Cameras and Free Cameras
- Path Cameras
- Look through selected, view planes

Class Workday following lecture

Composition Concerns – Rule of Thirds, Foreground/Background elements; Depth of Field

Lecture: Rendering Concepts: Cameras, line of action, composition

Compositing and editing your movies.

Adding audio, render window

Efficient rendering concepts

Developmental sketches and Papers for Project 1 due at beginning of class*

Final Project Handouts and Guidelines for Storyboards and Animation. Final projects must use project 1 for each individual. Creation of character model (human, animal, insect, etc. can be completed), texture, lighting for production. Must complete a proposal, create a morgue photoshop collection of reference, and sketch series.

Week 10

Overview of procedures used in Demo

Exterior/Foliage Environments Demo

Discussion of Paint Effects, Lighting, Etc.

Animation Techniques Demo

Storyboards and Papers due for Final Project: Class presentations for potential projects *

Review Tools, Techniques, and Concepts

Project #1 Midterm due: presentation and overview

Must turn in Maya and Texture files

Present your work and be prepared to discuss completion of goals and objectives, your concept from beginning to completion, and future outlook for final project.

Final Project Work time

Week 11

Overview of procedures used in Demo

Continuation of Exterior/Foliage Environments

Animation Techniques Demo Continued

Storyboard Review: Each student will discuss their developmental sketches and project proposal in a short presentation if time permits

Final Project Class Work time

Week 12

Overview of procedures used in Demo
Exterior/Foliage Environment Demo Continued
Final Project Class Workday

Week 13

Animation Techniques Demo Continued
Final Project: Class Workday

Week 14

Animation Techniques Demo Continued
Lighting your exterior Environment Demo
Final Project: Class Workday

Week 15

Final Project: Class Workday

Week 16

Final Projects Due: Complete Presentation of Setup, Storyboard, 3D Components, and Review; Must turn in Final Movie and Maya File and Textures