



## **CIDG 160**

3DS MAX FUNDAMENTALS  
COURSE SYLLABUS • FALL 2008  
SECTION NO. 21169 • 3 UNITS

### **COMPUTER INTEGRATED DESIGN AND GRAPHICS DEPARTMENT VICTOR VALLEY COLLEGE**

- CLASS HOURS** • MONDAY and WEDNESDAY 9:35 AM – 12:00
- LOCATION** • DIGITAL ANIMATION LAB BUILDING 21A-1 LOWER CAMPUS
- INSTRUCTOR** • STEVE NELLE (760) 245-4271 EXT 2653 EMAIL: nelles@vvc.edu
- PREREQUISITE** • **NONE**
- TEXTBOOK** • LEARNING 3DS MAX 2008 FOUNDATION ISBN # 0-240-80927-0
- CALENDAR**
- |                          |                |
|--------------------------|----------------|
| • INSTRUCTION BEGINS     | AUGUST 25      |
| LABOR DAY HOLIDAY        | SEPTEMBER 1    |
| VETERAN'S DAY HOLIDAY    | NOVEMBER 10    |
| THANKGIVING DAY HOLIDAYS | NOVEMBER 27–28 |
| SEMESTER ENDS            | DECEMBER 13    |
- WITHDRAWAL POLICY** • LAST DAY TO WITHDRAW FROM A SEMESTER LENGTH CLASS AND RECEIVE A 'W' GRADE IS SEPTEMBER 17, 2008.
- NOTE** • PLEASE REMEMBER THAT IT IS THE STUDENT'S RESPONSIBILITY TO DROP A CLASS. THE WITHDRAWAL PROCESS IS NOT AUTOMATIC AND COULD RESULT IN THE STUDENT RECEIVING A COURSE GRADE OF **F** SHOULD THE PROCESS NOT BE COMPLETED CORRECTLY. IF YOU HAVE ANY QUESTIONS OR CONCERNS, PLEASE TALK TO YOUR INSTRUCTOR.
- ATTENDANCE** • REGULAR ATTENDANCE IS EXPECTED AND CONSIDERED PART OF SUCCESSFULLY COMPLETING THE CLASS. EACH STUDENT IS REQUIRED TO SIGN IN ON A DESIGNATED ATTENDANCE SHEET IN ORDER TO BE COUNTED AS PRESENT FOR THAT DAY. EXCESSIVE ABSENCES FROM CLASS WILL BE CONSIDERED GROUNDS FOR THE STUDENT BEING DROPPED.
- GRADING POLICY** • YOUR FINAL GRADE WILL BE BASED ON THE ACCUMULATED POINTS

YOU EARN ON EIGHT (8) CLASSROOM TESTS AND/OR PROJECTS AND ONE (1) FINAL PROJECT. EACH ASSIGNMENT WILL BE WORTH ONE HUNDRED (100) POINTS. THE FINAL PROJECT WILL BE WORTH TWO HUNDRED (200) POINTS.

ALL ASSIGNMENTS WILL BE DUE ON THE DATE SCHEDULED. LATE PROJECTS WILL BE ACCEPTED UP TO TWO (2) WEEKS AFTER THEIR DUE DATE. THERE WILL BE AN AUTOMATIC TWENTY-FIVE (25) POINT DEDUCTION PENALTY FOR ANY PROJECT THAT IS TURNED IN LATE. PROJECTS WILL **NOT** BE ACCEPTED AFTER THE TWO WEEK TIME FRAME UNLESS PRIOR ARRANGEMENTS HAVE BEEN MADE WITH YOUR INSTRUCTOR. CLASSROOM TESTS WILL BE REQUIRED TO BE COMPLETED ON THE DAY THEY ARE ASSIGNED. COMPLETION OF EACH SOFTWARE-RELATED PROJECT WILL REQUIRE THE STUDENT TO PROPERLY TRANSFER THEIR COMPLETED WORK TO THE DIGITAL ANIMATION LAB'S NETWORK SERVER FOR EVALUATION. STUDENTS WILL BE INSTRUCTED AS TO THE SPECIFIC SERVER LOCATION (DIRECTORY) FOR THEIR COMPLETED WORK. SAVING TO THE PROPER LOCATION WILL BE CONSIDERED PART OF SUCCESSFULLY COMPLETING THE ASSIGNMENT.

EXTRA CREDIT ASSIGNMENTS MAY BE MADE AVAILABLE FOR STUDENTS INTERESTED IN IMPROVING THEIR OVERALL FINAL GRADE. ARRANGEMENTS MUST BE MADE  PRIOR TO BEGINNING WORK ON SUCH PROJECTS. INSTRUCTOR APPROVAL AND ADEQUATE TIME FOR ASSIGNMENT COMPLETION ARE REQUIRED. IF INTERESTED, PLEASE DISCUSS THE POSSIBILITY OF COMPLETING AN EXTRA CREDIT ASSIGNMENT WITH YOUR INSTRUCTOR.

FINAL GRADES WILL BE COMPUTED USING THE FOLLOWING POINT SYSTEM

<u>Grade</u>	<u>Total Points</u>	<u>% of Total Points</u>
A	900 – 1000	100 – 90
B	800 – 899	89 – 80
C	650 – 799	79 – 65
D	600 – 649	64 – 60
F	599 or less	59 % or less

Course Description

Using one of the industry's premiere 3D software applications, this course is designed to teach students the fundamental concepts and procedures required for creating quality three-dimensional animations. Students are introduced to a wide range of topics including basic and advanced modeling techniques, the use of object-based modifiers, creating realistic materials, using lights and cameras, essential special effects including particle systems and space warps, rendering procedures and keyframe animation and editing. Students will also have the opportunity to explore relevant issues dealing with the pre-production process, traditional animation principles and industry trends and analysis.

## Course Objectives

Upon completion of this course the student will:

1. Possess an understanding of the fundamental elements of creating, manipulating and reviewing a complete three-dimensional model rendering.
2. Understand the procedures and techniques necessary for creating realistic scene elements including life-like surface textures, mood lighting and effective camera angles.
3. Understand the process of creating and editing keyframed animation for the purpose of producing a wide range of motion styles.
4. Understand how to produce animations specific to a wide range of applications including entertainment, video games, architecture and the World Wide Web.

## Required Materials

Other than course books, there are NO required materials. It is recommended that students purchase blank CDs for backing up your work. Victor Valley College assumes no responsibility for lost or corrupted student work.

## Supplemental Materials

Students will be provided handouts throughout the course. Each handout is designed to bolster the student's understanding of course concepts and principles, in addition to adding important information relevant to the subjects covered.

## Lab Time

The Digital Animation Lab will be open for students needing additional time to complete their assignments and/or wishing to further their knowledge and experience level. A schedule providing details as to when the Lab will be open for student use will be handed out during the first week of instruction.

### Lab Visitors

The use of Digital Animation Lab work stations is limited to students currently enrolled in one or more Digital Animation classes. We unfortunately must ask that visits from family and friends be restricted to individuals officially enrolled at Victor Valley College because of insurance and/or liability concerns. If you have any questions or special circumstances, please talk with your instructor.

### Food and Drink

The Digital Animation Lab instructors ask that NO food be brought into the classroom. Beverages are permitted but must be kept away from the work stations due to concerns pertaining to spillage and equipment damage. A table has been set up on the parking lot side of the classroom for any drinks that may be brought into the Lab.

### Cell Phones

If you happen to carry a cell phone, we ask that you turn down the volume of the ringing device as consideration to others. Phones should preferably be turned to vibrate mode if possible. If your phone does ring, we ask that you take your call outside to avoid disrupting class.

### Plagiarism

Cheating is a serious offense, and will be dealt with accordingly. Any student caught plagiarizing either a written exam or hands on project, risks being dropped from class and receiving an F for a final grade.

### Importance of Traditional Art Training

In as much as one doesn't have to be an artist to be a successful computer animator,

having a foundation built on traditional art concepts and principles is definitely of value.

If you are serious about the field of Animation, we would strongly recommend that you consider taking a few Art courses while at VVC. Classes in drawing and composition, color and design, life drawing and/or sculpture would all be outstanding choices to improve your sense of design and proportion. The Digital Animation staff of instructors would be happy to answer any questions you might have as to what specific Art courses would be most appropriate to your goals and interests.

## Suggestions Additional Readings / Video Training

### 3ds Max Specific

3ds Max 2009 Essential Training (video training DVD)

lynda.com

ISBN: 1596714689

3ds Max 2009 Beyond the Basics (video training DVD)

lynda.com

ISBN: 1596714786

3ds Max 2009 Bible

Kelly Murdock

ISBN: 0470381302

How to Cheat in 3ds Max 2009

Michele Bousquet

ISBN: 0240810325

3ds Max 9 Modeling (video training DVD)

lynda.com

ISBN: 1596713879

### General Animation

Animation: From Script to Screen

Shamus Culhane

ISBN: 0312050526

The Illusion of Life

Frank Thomas & Ollie Johnston

ISBN: 0786860707

## Suggestions Additional Readings (cont.)

The Animator's Survival Kit

Richard Williams  
ISBN: 0571202284

Animation from Pencil to Pixels  
Tony White  
ISBN: 0240806700

Timing for Animation  
Harold Whitaker & John Halas  
ISBN: 0240517148

Storytelling Through Animation  
Mike Wellins  
ISBN: 1584503947

Cartoon Animation  
Preston Blair  
ISBN: 1560100842

Film Directing: Shot by Shot  
Steven Katz  
ISBN: 0914188108

Digital Cinematography  
Ben de Leeuw  
ISBN: 0122088751

Digital Character Animation 3  
George Maestri  
ISBN: 0321376005

Digital Texturing and Painting  
Owen Demars  
ISBN: 0735709181

Your Career in Animation: How to Survive and Thrive  
David Levy  
ISBN: 1581154453

Producing Animation  
Catherine Winder & Zahra Dowlotabadi  
ISBN: 0240804120

## Course Outline

Note: Course work and subject material may be presented in a different order than listed.

## I. Traditional Animation Principles and Practices

- A. The Production Process -- From Script to Screen
  - 1. Developing a Concept
  - 2. Telling a Good Story
  - 3. The Elements of Color, Design and Composition
  - 4. Workflow
  - 5. Output Issues
  
- B. Principles of Animation
  - 1. Anticipation
  - 2. Squash and Stretch
  - 3. Overlapping Action
  - 4. Follow-Through
  - 5. Staging
  - 6. Exaggeration
  - 7. Secondary Motion
  - 8. Weight & Timing
  - 9. Ease In / Ease Out
  - 10. Arcing Motion
  - 11. Symmetry
  
- C. Storyboards
  - 1. The Use of Storyboards
  - 2. The Importance of Storyboards
  - 3. Creating Storyboards

Test: The Principles of Animation

## II. Industry Trends and Analysis

- A. Introduction to Computer Generated Imagery
- B. Applications and Uses
- C. Where the Jobs Are
- D. What Employers Look For
- E. Demo Reel Suggestions

## III. 3D Basics

- A. Working in 3ds Max General Concepts and Principles
  - 1. Introduction to 3ds Max

2. Understanding 3D Space – Is it X, Y or Z?
3. Interface Overview & Customization
4. Measurement Systems
5. Using Snaps Move, Rotate, Scale
6. Grid Setup Options Home, Helper, AutoGrid
7. Viewport Navigation Controls
8. Object Selection – Methods and Techniques
9. File Management Save, Hold/Fetch, Archive
10. Right Mouse Click Features

#### IV. 2D Modeling

##### A. 2D Shape Anatomy

1. Vertex
2. Segment
3. Spline

##### B. Creating Basic 2D Geometry (Shapes)

1. The Rendering and Interpolation Rollouts for Splines
2. Line
3. Rectangle
4. Circle
5. Ellipse
6. Arc
7. Text
8. Helix
9. The Edit Spline Modifier

#### IV. 3D Modeling

##### A. 3D Mesh Anatomy

1. Vertex
2. Edge
3. Face / Polygon
4. Boundary
5. Surface Normals
6. The Edit Mesh and Edit Poly Modifiers
7. The Optimize Modifier
8. The MeshSmooth and TurboSmooth Modifiers
9. Tessellation
10. Subdivision Surfaces

#### IV. 3D Modeling (cont.)

##### B. Creating Standard Primitives

1. Box

2. Sphere
  3. Geosphere
  4. Cylinder
  5. Tube
  6. Cone
  7. Torus
- C. Creating Extended Primitives and Patch Grids
1. Chamfer Box
  2. Chamfer Cylinder
  3. Capsule
  4. Oil Tank
  5. Spindle
  6. L-Ext and C-Ext
  7. Tri and Quad Patches

## V. Working with Your Models

- A. Model Editing
1. Object Selection – Methods and Techniques
  2. Transformations
  3. Sub-Object Selection
  4. Sub-Object Transformations
  5. Copies, Instances and References
  6. Pivot Points and Working Pivot Mode
  7. Coordinate Systems
  8. What is a Modifier?
  9. What is the Modifier Stack?
  10. Collapsing the Stack – Do I or Don't I?

Test: 3ds max Interface

## VI. Additional Modeling Techniques

- A. Using 2D Shapes to Create 3D Objects
1. Extrude
  2. Lathe
  3. Loft

## VI. Additional Modeling Techniques (cont.)

- B. 3D Modeling Commands
1. Boolean and ProBoolean

2. FFD Free Form Deformations
3. Paint Deformation
4. Modeling Problems and Abnormalities
5. Attaching Objects
6. Grouping Objects

## PROJECT: Basic Modeling

- C. Modeling with Modifiers
  1. Selection Modifiers
  2. Surface Modifiers
  3. Spline Edit Modifiers
  4. Mesh Editing Modifiers
  5. Parametric Deformation Modifiers

## VII. Adding Materials to a Scene

- A. Introduction to Materials
  1. What is a Material/Shader?
  2. Introduction to the Material Editor
  3. Material Types
  4. Shading Types
  5. Controlling the Body Color
  6. Using Bitmaps to Design a Material
  7. Adding Shine Specular Highlights
  8. Bump and Displacement
  9. Opacity
  10. Reflection
  11. Self-Illumination
  12. Material Libraries
- B. Material Mapping Coordinates
  1. The UVW Map Modifier
  2. Mapping Coordinate Types
  3. Coordinate Alignment Tools
  4. Sub-Object Mapping and Map Channels
  5. The Unwrap UVW Modifier

## VII. Adding Materials to a Scene (cont.)

- C Complex Materials

1. Blend
  2. Composite
  3. Top/Bottom
  4. Double Sided
  5. Raytrace
  5. Matte/Shadow
  6. Morpher
  7. Ink N Paint
  8. Multi/Sub-Object
- D. Other Material Map Types
1. Raytrace
  2. Reflect / Refract
  3. Procedural Maps
  4. Mix
  5. RGB Tint

## VIII. Rendering

- A. Introduction to Rendering
1. What is Rendering?
  2. Introduction to the Render Setup Dialogue
  3. Various Rendering Techniques Selected, Region, Blowup
  4. Active Shade
  5. Previewing an Animation
  6. Saving a Render
  7. Viewing a Rendered Image/Animation
  6. RAM Player
  7. Environments and Backgrounds
  8. Rendering Effects
  9. Depth of Field
  10. Motion Blur

PROJECT: BUILDING MATERIALS USING  
INTERNET RESOURCES

PROJECT: Creating & Applying Materials

## IX. Lighting

- A. Introduction to Lighting
1. Lighting Theory - Mood and Influence

2. CG Lights vs. Real World Lights
3. Light Types
4. Lighting Setup and Placement
5. Hotspot, Falloff and Light Shape
6. Shadows
7. Multiplier
8. Attenuation and Decay
9. Projector Lights
10. Volume Light
11. Sunlight
12. Global Illumination and Mental Ray

PROJECT: Scene Lighting

## X. Cameras

### A. Introduction to Cameras

1. The Camera's Purpose – Choosing Your Angle and Lens Length
2. Camera Types
3. Depth of Field
4. Safe Frame
5. Clipping Planes
6. Camera Motion Blur
7. Constraining a Camera to a Path

Test: cameras

## XI. Animation

### A. Introduction to Animation

1. Creating Keyframes – Auto Key vs. Set Key
2. Timeline Overview
3. Time Configuration
4. Frames per Second (fps) Considerations
5. Animating an Object
6. Animating a Modifier

## XI. Animation (cont.)

7. Animating Materials

8. Animating Lights
9. Animating Cameras
10. Trajectories, Ghosting and Show Key Times

#### B. Track View

1. What is the Curve Editor
2. What is the Dope Sheet
3. Editing Keyframes
4. Editing Tangencies
5. Editing Time

#### C. Special Animation Techniques

1. Path Animation
2. Path Deformation
3. Animating a Lofted Model
4. Animating Booleans Operations
5. Controlling Visibility

#### D. Hierarchy and Linking

1. Introduction to Creating a Hierarchy
2. Linking and Forward Kinematics
3. Creating Links
4. Pivot Points
5. Parent-Child Inheritance
6. Dummy Objects

Test: animation critique

## XII. Adding Special Effects

### A. Introduction to Space Warps

1. Space Warp Basics
2. Supported Object Types
3. Binding Objects to Space Warps
4. Forces
5. Deflectors

## IX. Adding Special Effects (cont.)

### B. Introduction to Particle Systems

1. What is a Particle System?

2. Types of Particle Systems
3. Creating a Particle System
4. Adding Motion Blur to Particles
5. Adding Gravity, Deflectors and Other Space Warps

Project: Final