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AUTODESK
Authorized Training Center

Autodesk Maya in 16 Steps

Target Audience

This course is designed for aspiring 3D artists, animators, visual effects students, and digital media enthusiasts who want to build foundational to intermediate skills in Autodesk Maya. It is ideal for individuals looking to enter the entertainment, gaming, film, animation, or digital media industries, as well as for students and professionals who want a structured, hands-on guide to Maya's core toolset — from interface navigation and polygon modeling through dynamics, scripting, and rendering.

Course Objective

This course aims to provide participants with comprehensive, practical knowledge of Autodesk Maya from setting up the interface and working with primitives, to advanced modeling, rigging, animation, dynamics, and rendering. By the end of this course, learners will be able to create professional-quality 3D assets, characters, animations, and rendered outputs using industry-standard workflows in Maya.

Course Outcome

- **Interface and Workflow Proficiency –** Navigate Maya's interface including menus, shelves, Channel Box, Layer Editor, Toolbox, and Marking Menus with confidence.
- **Viewport and Scene Control –** Manage view panels, display options, layouts, and the Outliner to organize and visualize 3D scenes effectively.
- **3D Modeling Mastery –** Create and edit polygon, NURBS, and curve-based objects using a full range of modeling tools including Booleans, deformers, edge loops, and the Quad Draw tool.
- **Texturing and Shading Skills –** Apply materials, work with the Hypershade editor, map UVs, use displacement and bump maps, and paint textures in 2D and 3D.
- **Rigging and Character Animation –** Build skeletons, skin characters, add IK handles, paint weights, create walk cycles, and use the Quick Rig tool for automatic rigging.
- **Dynamics and Effects –** Simulate particles, rigid bodies, cloth, fluids, and visual effects including fire, lightning, and fireworks using Maya's dynamics system.
- **Lighting and Rendering Expertise –** Set up cameras, create and configure lights, enable raytracing and motion blur, and render scenes using Maya Software, Arnold, and Vector renderers.
- **MEL Scripting Fundamentals –** Use the Command Line and Script Editor to execute, record, and save MEL scripts to automate and extend Maya workflows.

Course Outline

The course comprises **48 hours** of **16 comprehensive** chapters covering the full range of Autodesk Maya features — from foundational interface skills through advanced dynamics, scripting, and rendering. Each chapter includes structured lessons with hands-on tutorials to reinforce learning.

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Chapter 1: Learning the Maya Interface

Working with Menus

- Changing menu sets
- Viewing keyboard hotkeys
- Accessing option dialog boxes
- Using tear-off menus
- Understanding tools versus actions

Using the Status Line

- Using pop-up help and cursor clues
- Expanding/collapsing icon button groups
- Opening and saving a scene
- Using the Home Screen and opening editors
- Showing and hiding interface elements

Accessing the Shelf

- Using the shelf menu
- Creating and deleting shelves
- Adding icons, menu commands, layouts, and scripts to a shelf
- Using the Shelf Editor

Channel Box and Layer Editor

- Selecting and changing attributes
- Locking attributes
- Adding/deleting layers and adding objects to layers
- Hiding and freezing layer objects

Animation Controls, Command Line & Help Line

- Selecting frames and setting animation range
- Playing animations and accessing animation preferences
- Using the Command Line and Help Line

The Toolbox

- Selecting objects
- Using transform tools (Move, Rotate, Scale)
- Understanding manipulators

Marking Menus and Hotbox

- Accessing and customizing Marking Menus
- Using and customizing the Hotbox

Chapter 2: Controlling the View Panel

Changing the View

- Tumble, Track, Dolly, and Camera tools
- Framing objects and moving through views
- Tearing off panels, heads-up displays, grids
- Annotating with Blue Pencil tools

Changing Display Options

- Changing resolution and shading modes
- Displaying textures and enabling backface culling
- Isolating, hiding, showing objects
- Changing object name and color

Changing the Layout

- Switching and customizing layouts
- Resizing and editing view panels
- Using the Outliner
- Searching commands, tools, and scene objects

Chapter 3: Starting with Primitive Objects

Polygon Primitives

- Creating and manipulating polygon primitives
- Creating gears and abstract objects

NURBS Primitives

- Creating spheres, cubes, cylinders, cones, planes, and tori
- Inserting isoparms

2D Primitives and 3D Type

- Creating circles, squares, and arcs
- Generating and beveling text curves
- Creating 3D signs

Construction Aids and Content Browser

- Construction planes, image planes, locators, annotations, and measure tools
- Browsing and loading meshes from the Content Browser

Importing Objects

- Importing 3D meshes, 2D outlines, Adobe Illustrator content, and SVG files
- Creating 3D meshes from 2D outlines

Chapter 4: Working with Objects

Selecting Objects

- Selecting multiple objects and using selection masks
- Saving selection sets

Selecting Components

- Switching to component mode
- Selecting, growing, and shrinking selections
- Selecting edges

Transform, Group, and Parent Objects

- Understanding pivot points
- Transforming along axes and within planes

- Grouping and parenting objects
- Using Undo, Redo, Repeat

Snapping and Aligning Objects

- Snapping to grids, curves, live objects, and surfaces
- Duplicating with transform, replacing objects, aligning objects and points

Nodes and Attributes

- Node types and the Attribute Editor
- Viewing and deleting construction history
- Editing attributes and connecting nodes
- Using the Node Editor

Chapter 5: Creating and Editing Polygon Objects

Normals and Manual Polygon Creation

- Understanding and controlling normals
- Creating, appending, combining, and mirroring polygons

Editing Polygons

- Subdividing, splitting, cutting, merging vertices
- Merging/collapsing edges, bridging edges, deleting components

Polygon Operations

- Duplicating faces, extruding components, Smart Extrude
- Chamfering vertices, beveling edges, poking and wedging faces
- Using symmetry

Retopology and Smooth Polygon Edges

- Retopologizing meshes
- Smoothing with subdivisions, Smooth Proxy, vertex averaging
- Adding creases, unsmoothing dense meshes

Booleans and Triangulation

- Union, difference, intersection, slice, punch holes
- Using Boolean Volumes, triangulating, and flipping triangle edges

Creating Holes and Edge Loops

- Detaching vertices/faces, using the Make Hole tool, filling holes
- Selecting and inserting edge loops, rings, and borders

Modeling Toolkit and Quad Draw

- Soft selection, constraints, Target Weld, Connect tool
- Creating, moving, relaxing, extending, and deleting components with Quad Draw

Chapter 6: Working with NURBS Surfaces

Editing NURBS Surfaces

- Selecting components, Surface Editing Tool, Sculpt Geometry Tool
- Simplifying surfaces, breaking and smoothing tangents

Surface Operators

- Attaching, detaching, aligning, closing/opening surfaces
- Extending, offsetting, filleting, and blending surfaces

Trimming and Boolean Tools

- Drawing and projecting curves onto NURBS, trimming surfaces
- Union, Difference, and Intersect Boolean tools

Stitching and Converting Surfaces

- Global stitch, stitching surface points and edges
- Converting NURBS to polygons and subdivision surfaces

Chapter 7: Drawing and Editing Curves

Creating and Editing Curves

- Creating smooth, straight, and freehand curves
- Editing curve tangents, adding sharp points, closing curves

Modifying Curves

- Locking length, straightening, smoothing, curling, bending, and scaling curvature

Curve Operators and Sweep Mesh

- Attaching, aligning, detaching, offsetting, and filleting curves
- Creating sweep mesh objects with cross-sections, twist, and taper

Creating Surfaces from Curves

- Revolving, lofting, planar, boundary, extrusion, and Birail surfaces

Chapter 8: Using Deformers

Nonlinear Deformers

- Bend, Flare, Squash, Twist, and Wave deformers
- Managing, combining, painting deformer weights

Lattice and Wire Deformers

- Using Lattice deformer for broad shape changes
- Using Wire deformer for precise control

ShrinkWrap and Component Deformers

- Conforming objects with ShrinkWrap
- Component Tags, Cluster, Solidify, and Delta Mush deformers

Softbody and Texture Deformers

- Creating softbody objects
- Deforming geometry with texture maps

Chapter 9: Assigning Materials and Textures

Applying and Working with Materials

- Applying, renaming, and changing materials and OpenPBR presets
- Using the Hypershade: Create Bar, Work Area, node connections, Material Viewer

Material and Texture Types

- Lambert, Phong, Blinn, ai Standard Surface, Ramp Shader, Shading Map
- Connecting texture nodes, bump maps, file textures, and layering textures

Positioning Textures and Displacement Maps

- Default, projection, 2D, and 3D texture placement
- Bump vs. displacement maps, adding relief, converting displacement to geometry

Utility Nodes and 3D Painting

- General, color, and switch utility nodes
- Assigning paint textures, brush types, painting attributes in 3D

UV Editing

- Accessing the UV Editor, selecting and editing UV components
- Unfolding, cutting, sewing, arranging UV shells, and generating UV snapshots

Chapter 10: Adding Paint Effects

Preset and Custom Brushes

- Accessing Paint Effects panel, using preset brushes from the Content Browser
- Changing brush types, size, color; enabling illumination, shadows, and glows

Painting in 2D and 3D

- Using the Paint Effects Canvas, changing canvas size, creating seamless textures
- Painting in view panels, painting on objects, auto-painting

Editing Paint Effects

- Selecting and editing strokes
- Converting strokes to polygons
- Changing default light

Chapter 11: Using Cameras and Lights

Working with Cameras

- Creating and positioning cameras, looking through cameras
- Setting view guidelines, changing depth of field

Creating Backgrounds

- Setting background color, adding image planes and textured backgrounds
- Loading and positioning background images

Creating and Configuring Lights

- Understanding light types (ambient, directional, spot, point, area)
- Creating, manipulating, and linking lights to objects

Light Settings and Effects

- Changing color, intensity, and decay; enabling shadows
- Creating light fog, glows, halos, and lens flares

Chapter 12: Animating with Keyframes

Setting Keyframes

- Setting, selecting, copying, and deleting keys; using Auto Key
- Adding bookmarks and snapping keys

Viewing and Previewing Animation

- Previewing, looping, setting frame rate; enabling ghosting and motion trails
- Using Cached Playback and Playblast

Motion Paths

- Creating motion path keys, drawing and attaching objects to motion paths
- Deforming objects along motion paths

Editing Animation Curves and Timing

- Using the Graph Editor: tangent types, rescaling, smoothing, and infinity conditions
- Using the Dope Sheet: selecting, moving, scaling, muting keys
- Defining channel sets, inserting keys, and adding sound

Chapter 13: Working with Characters

Building and Editing Skeletons

- Creating, inserting, mirroring, and naming joints
- Setting joint orientation, labels, limits, and display attributes

Inverse Kinematics

- Creating IK Handle and IK Spline Handle
- Posing IK handles, switching between FK and IK

Skinning a Character

- Positioning and binding skin, using X-Ray Mode
- Animating joints and creating walk cycles

Editing Skin Weights

- Adding influence objects, painting and smoothing skin weights
- Mirroring and resetting skin weights

Automatic Rigging and Hair/Fur

- One-click and step-by-step rigging using Human IK
- Animating with motion capture data
- Adding preset hair, creating and styling dynamic hair, rendering with XGen

Chapter 14: Animating with Dynamics

Particles and Emitters

- Creating particles and surface particles, setting lifespan and render types
- Omni, directional, volume, and object emitters
- Using instances and cycling instances

Fields, Goals, and Rigid Body Collisions

- Connecting objects to fields, regulating field forces, establishing goals
- Adding rigid and passive body objects, using MASH Dynamics

Particle Collisions and Cloth

- Enabling particle collisions, defining events, assigning solvers
- Creating cloth, collision objects, and setting cloth properties

Constraints, Fluids, and Effects

- Adding constraints, component constraints, and springs
- Creating fluid containers, emitters, oceans, and ponds
- Creating fire, smoke, fireworks, lightning, shattering objects, and curve flow

Chapter 15: Rendering a Scene

Configuring the Render Process

- Choosing a renderer, saving render presets
- Changing file name, format, camera view, resolution, and render layers

Special Rendering Features and Render View

- Adjusting render quality, enabling raytracing and motion blur
- Rendering regions, using Interactive Photorealistic Rendering (IPR)

Final Render and Vector Rendering

- Rendering single frames and animation sequences
- Rendering to animation formats; using Maya Vector renderer

Arnold Renderer

- Selecting Arnold, configuring Arnold render settings, using Arnold RenderView
- Using Arnold OpenPBR Surface Shader, converting legacy materials to Arnold
- Using Arnold Area Lights, Skydome Light, HDRI images, and Physical Sky

Chapter 16: Using MEL Scripting

MEL Command Line

- Using MEL in the Command Line
- Repeating commands and using MEL scripting commands

Script Editor

- Executing script commands, viewing interface commands
- Reusing interface commands, saving scripts, adding scripts to the Shelf