

Maya Intermediate Standards

Based on a long-term commitment to education, Autodesk Media & Entertainment is providing a set of standardized topics and features to help trainers and educational institutions develop the necessary skills to teach Maya. These standards are the result of extensive interviews with artists, trainers, and managers at prestigious game and film companies. They ultimately provide the Maya community with clear definitions and benchmarks for user skill levels. The standards consist of a set of industry-specific topics common to all skill levels. For each skill level, a set of appropriate Maya features is defined for each topic. Initially, 2 levels of competency have been established:

- Fundamentals & Intermediate (Level 1)
- Advanced (Level 2)

The Maya Standards have the following goals:

- Ensure users/students achieve a level of knowledge of Maya beyond the fundamentals, and allow them to become more technically proficient and productive with the software.
- Standardize the requirements for Intermediate training on Maya.
- Provide a clear picture for everyone on what should be learned and taught at this level.
- Provide a basis of technical knowledge for instructor certification

Competency Levels

Completing one or more of the instructional levels does not establish the instructor's level of knowledge in Maya. For example, an instructor's interest in teaching fundamentals does not necessarily mean their knowledge is limited to only fundamentals. In fact, most instructors teaching at the Fundamental level are accomplished and established Maya users.

Completing Advanced Level certification does not mean the instructor is certified at the Fundamental level. The skill set to teach fundamentals is quite different than the skill set required teaching an advanced audience.

Industry Specific Topics

In each level of instruction and certification the Topics below will be covered. Each topic's coverage will vary according to the level. For example, more modeling might be covered in the Fundamentals and Intermediate levels, while Scripting receives only a small amount in fundamentals. Once in the Advanced and Expert Levels, the amount of time spent on modeling vs. scripting might be entirely reversed.

1. UI/Scene Management
2. Modeling
3. Camera
4. Lighting
5. Rendering
6. Materials/Textures
7. Global Illumination
8. Animation
9. Effects
10. IK / Rigging
11. Dynamics
12. Scripting
13. Scene Assembly

Maya Intermediate Learning Standards

Maya Intermediate Standards

The learning standards for Maya intermediate are described below. Each item in the list is the smallest teachable piece of content.

During the workshop, the instructor is given 2 topics to teach during the workshop. The allotted presentation time for each topic is one hour. The instructor chooses from the topic and decides what they will cover for that Module.

<i>Topic</i>	<i>Sub-Topic</i>	<i>Content</i>
UI/Scene Management		
	Preferences>Interface	<i>Interface</i>
	Preferences>UI Elements	<i>Visible UI Elements Editor in Main Window Panel Configurations</i>
	Preferences>Help	<i>Heads Up Display Popup Help</i>
	Preferences>Display	<i>Performance View</i>
	Preferences>Manipulators	<i>Manipulator Sizes</i>
	Preferences>Settings	<i>World Coordinate System Working Units</i>
	Preferences>Files/Projects	<i>Project Settings Recent History Size</i>
	Preferences>Timeline	<i>Timeline Playback</i>
	Preferences>Undo	<i>Undo</i>
	Preferences>Save Actions	<i>Preferences and Settings</i>
	Preferences>Modules	<i>Load on Startup</i>
	Preferences>Applications	<i>Application Path for Viewing Images Application Path for Viewing Sequences</i>
	UI Navigation/Interaction	<i>Custom Menu Sets Hotkey Editor Color Settings Marking Menu Editor Shelf Editor Panel Editor</i>
	Settings/Preferences>Plug-In Manager	<i>Loaded vs. Auto Load Getting Plug-in Information Demo loading / unloading Plug-Ins</i>
	Selection of Objects	<i>Selection Sets Select Hierarchy (Demo selecting only)</i>

Transforms	<ul style="list-style-type: none"> <i>templated objects in viewports)</i> <i>Offset object (+= / -= in transform field)</i> <i>Reset Transformations</i> <i>Freeze Transformations</i> <i>Snap Align Objects</i> <i>Align Objects (Options Dialog)</i>
Object Management	<ul style="list-style-type: none"> <i>Measure Tools</i> <i>Annotation</i>
Channel / Attribute Management	<ul style="list-style-type: none"> <i>Keyable vs. Nonkeyable Attributes</i> <i>Locked vs. Non Locked Attributes</i> <i>Channel Control UI</i> <i>Connection Editor</i> <i>Demo making / breaking Node connections using the Connection Editor</i>
Channel Box UI	<ul style="list-style-type: none"> <i>Customization Settings (Change Precision, Reset to Default)</i> <i>Channel Names (Nice, Long, Short)</i> <i>Resizing the Channel Box</i>
Hypergraph UI	<ul style="list-style-type: none"> <i>Hypergraph Scene Hierarchy</i> <i>Hypergraph Input and Output Connections</i> <i>Demo making / breaking Node connections in the Hypergraph</i>

<i>Topic</i>	<i>Sub-Topic</i>	<i>Content</i>
Modeling I		
	Creating Reference Material	<i>Lecture</i>
	Collecting Reference Material	<i>2D Images</i> <i>3D Objects</i>
	Set up scenes for Reference Material	<i>Image Plane(s)</i> <i>Construction Plane(s)</i> <i>Template / Untemplate Objects</i>
	Path-driven Geometry Creation	<i>Create Animation Snapshot</i> <i>Create Animated Sweep</i> <i>(Discuss advantages of turning on/off Construction History during creation)</i>
	Maya Modeling Paradigms	<i>Discuss general pros/cons of each paradigm and which geometry type is suitable to various modeling tasks</i>
	NURBS Concept	<i>Curve / Surface Degrees</i> <i>Curve / Surface Parameterization (i.e. Knot Spacing)</i> <i>Open, Closed, and Periodic Geometry</i> <i>Curve / Surface Continuity</i>

	<i>Curve / Surface Direction</i>
	<i>NURBS UVs (Discuss relationship to surface creation)</i>
	<i>Modify>Convert (Options for NURBS)</i>
2D NURBS Curve Tools	<i>Adobe Illustrator Object</i>
NURBS Curve Editing	<i>Edit Curves Toolset (All Options)</i>
	<i>Reverse Curve Direction</i>
	<i>Rebuild Curve</i>
NURBS Curve Networks	<i>Definition / Lecture</i>
	<i>Workflow Demo</i>
	<i>Build a simple curve network with cross-sectional, span, and/or boundary curves for workflow example</i>
3D NURBS Surface Tools	<i>Surfaces Toolset (All Options)</i>
	<i>Birail Tools</i>
	<i>Boundary Tool</i>
	<i>Square Tool</i>
	<i>Bevel / Bevel Plus Tool</i>
NURBS Component Editing	<i>Display>NURBS>Normals (Shaded Mode)</i>
	<i>Display>NURBS>Patch Centers</i>
	<i>Display>NURBS>Surface Origins</i>
	<i>Move Normal Tool</i>
NURBS Surface Editing	<i>Edit NURBS Toolset (All Options)</i>
	<i>Reverse Surface Direction</i>
	<i>Rebuild Surfaces</i>
	<i>Sculpt Geometry Tool (Demo Artisan)</i>
	<i>Soft Modification Tool</i>
NURBS Trim Modeling	<i>Definition / Lecture (Discuss pros & cons of Trimming)</i>
	<i>Trimming options</i>
	<i>Tessellation of trimmed objects</i>
NURBS Trim Modeling (build real object)	<i>Build object (Ex. Toaster, TV Set, etc...) to demonstrate Trimming Workflow</i>
NURBS Patch Modeling	<i>Definition / Lecture (Discuss pros & cons of Patching)</i>
	<i>Workflow Demo</i>
NURBS Stitching	<i>Definition / Lecture</i>
	<i>Stitch Edges Tool</i>
	<i>Global Stitch</i>
	<i>Workflow Demo</i>
NURBS Patch Modeling (build real object)	<i>Build object (Ex. Teddy Bear, Human Hand, etc...) to demonstrate Patching</i>

NURBS Surface Deformation Tools	<i>& Stitching Workflow Sculpt Deformers Wire Tool Wrap Deformers</i>
Animated Sweep	<i>Demonstrate</i>
Preferences>NURBS	<i>Display Settings for new NURBS Objects</i>
Preferences>Modeling	<i>Output Geometry Type NURBS Interaction</i>
Preferences>Settings	<i>Tolerance</i>

Modeling II

Polygon Concept	<i>Planar vs. Non-planar Faces Non-manifold geometry Managing Poly Count (Discuss concerns associated with model complexity and/or interactivity)</i>
Polygon Tools	<i>Modify>Convert (Options for Polys) Mesh Toolset (All Options) Combine / Separate Booleans Smooth (Discuss potential Poly Count concerns) Create Polygon Tool Sculpt Geometry Tool (Demo Artisan) Mirror Geometry</i>
Polygon Component Editing	<i>Custom Polygon Display Surface normals Face normals Vertex normals Select Edge Loop Tool Select Edge Ring Tool < = Grow Selection Region > = Shrink Selection Region Move Normal Tool</i>
Polygon Surface Editing	<i>Edit Mesh Toolset (All Options) Extrude Keep Faces Together Split Polygon Tool Add Divisions Merge (Vertices, Edges) Delete Edge/Vertex Bevel Subdiv Proxy (discuss in relationship</i>

		<i>to low vs. high poly modeling)</i>
		<i>Demo Subdiv Proxy workflow with object such as a simple character</i>
Polygon Modeling (build real object)		<i>Build object (Ex. Biped Character, Sofa w/ Cushions, etc...) to demonstrate advanced Polygon modeling Workflow</i>
Polygon Surface Deformation Tools		<i>Sculpt Deformers Wire Tool Wrap Deformers</i>
Preferences>Polygons		<i>Display Settings for new Polygon Objects</i>
Preferences>Modeling		<i>Output Geometry Type Polygons</i>

Modeling III

Subdivision Surface Concept		<i>Discussion (Hybrid nature) Subdiv Surface components Standard Mode vs. Polygon Proxy Mode Hierarchy Levels (Concept) Viewport Display Resolution Modify>Convert (Options for Subdiv)</i>
Subdivision Surface Tools		<i>Subdiv Primitives Sculpt Geometry Tool (Demo Artisan)</i>
Subdivision Surface Editing		<i>Edge Crease Refine Selected Display Level / Display Filter Workflow Demo</i>
Subdivision Surface Modeling		
Subdivision Surface Modeling (build real object)		<i>Extrude Add Divisions Refine Selected</i>
Preferences>Subdivs		<i>Display Settings for new Subdiv Objects</i>

<i>Topic</i>	<i>Sub-Topic</i>	<i>Content</i>
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Camera

Camera Theory		<i>Lecture on basic cinematography Eliminating unnecessary camera moves Eliminating robotic looking camera moves Hand-Held look Framing and Composition Jump cuts Crossing the axis / 180 degree rule Depth of Field</i>
View Menu Settings		

		<p><i>Predefined Bookmarks</i></p> <p><i>Custom Bookmarks (Bookmark Editor)</i></p> <p><i>Panels>Look Through Selected</i></p> <p><i>Gates (No, Film, Resolution)</i></p>
	View>Camera Settings	
	Turntables	<i>Animate>Turntable...</i>
	Motion effects (Motion Blur)	<p><i>Focus and Blur</i></p> <p><i>2D vs 3D (Pros vs. Cons)</i></p>
	Preferences>Cameras	<p><i>Default Cameras (setting Near/Far Clip Planes)</i></p> <p><i>Animate Camera Transitions</i></p>
Lighting I		
	mental ray Light types	<i>Valid light types (point, spot, directional, area)</i>
	Standard mental ray Light attributes	<p><i>Caustic and Global Illumination</i></p> <p><i>Shadow Map Attributes</i></p> <p><i>Detail Shadow Map Attributes</i></p>
	Specific mental ray Lights	<p><i>mental ray Area light</i></p> <p><i>mental ray Area light Attributes</i></p> <p><i>Converting spot lights to mental ray</i></p> <p><i>Area lights (known issues)</i></p>
Lighting II		
	Layers	<i>Using Layers to manage your light setups/rigs</i>
	Common Light attributes	<p><i>Decay Rate</i></p> <p><i>Decay Regions</i></p> <p><i>Custom decay rate</i></p> <p><i>Emit Diffuse</i></p> <p><i>Emit Specular</i></p> <p><i>Illuminates by Default</i></p> <p><i>Color Mapping</i></p>
	Depth Map Shadows	<p><i>Advantages/Disadvantages of Dmap Shadows</i></p> <p><i>Optimizing with disk based dmaps (i.e. Reusing depth maps)</i></p> <p><i>Troubleshooting Dmap Shadows</i></p>
	Raytraced shadows	<p><i>Advantages/Disadvantages of Raytraced Shadows</i></p> <p><i>Incompatibility with IPR</i></p> <p><i>Troubleshooting Raytraced Shadows (ex. Self-shadowing "Terminator" effect)</i></p>
Rendering		
	Render Settings UI	<i>Common Tab</i>

Render Flags UI	<i>Explanation of UI</i>
Render Layer Editor	<i>Lecture (concept and uses) Explanation of UI</i>
IPR rendering	<i>Discussion - Interactive Photorealistic rendering uses and limits Demonstrate Workflow</i>
Maya Hardware Renderer	<i>Lecture – Uses Hardware render basics Render Settings>Maya Hardware Tab Hardware Render Buffer Dialog Demo</i>
Maya Vector Renderer	<i>Lecture - Uses Output options (Bitmap vs Vector) Vector output types Render Settings>Maya Vector Tab Demo</i>
Maya Software Renderer	<i>Anti-aliasing Quality (Edge anti-aliasing, Shading Samples, Multi-Pixel Filtering, etc...) Field Options Render Options Memory & Performance Options</i>
mental ray Renderer	<i>Quality presets Anti-aliasing Quality (Shading Samples, Multi-Pixel Filtering, etc...)</i>
Raytracing	<i>Lecture - absorption, reflection, and refraction of Light Enabling via Maya Software & mental ray Reflection Levels Refraction Levels</i>
Controlling renders	<i>Discussion of scene optimization techniques Reflection / Refraction Limits Workflow using Render Flags UI</i>
Introduction to Network Rendering	<i>Lecture Batch Render Dialog</i>

<i>Topic</i>	<i>Sub-Topic</i>	<i>Content</i>
Materials/Textures I	Real world materials and referencing that information in the Hypershade	<i>Lecture and Demonstration</i>

Special Use Surface Materials	<i>Layered Shader</i> <i>Ramp Shader</i> <i>Shading Map</i> <i>Surface Shader</i> <i>Use Background</i>
Common Surface Material Attributes	<i>Ambient Color</i> <i>Incandescence</i> <i>Translucence</i> <i>Diffuse</i> <i>Reflectivity</i> <i>Reflected Color</i>
Shared Surface Material Attributes	<i>Special Effects</i> <i>Matte Opacity</i> <i>Raytrace Options</i> <i>mental ray (Enabling reflection/refraction blur)</i>
Special Use Textures	<i>PSD File</i> <i>Water</i> <i>Layered</i>
Environment Textures	<i>Env Ball</i> <i>Env Chrome</i> <i>Env Cube</i> <i>Env Sky</i> <i>Env Sphere</i>
Image/Movie Textures	<i>Filter Type</i> <i>Interactive Image Caching</i> <i>HDRI Preview Options</i> <i>(Discuss) Importance of resolution</i> <i>(Discuss) Importance of tileable maps</i>
General / Color Utilities	<i>Multiply Divide</i> <i>Stencil</i> <i>Blend Colors</i> <i>Contrast</i> <i>Remap</i> <i>Switch (Discuss concept and uses)</i>
Shading Group Node Attributes	<i>Surface Material</i> <i>Displacement Material</i> <i>Volume Material</i> <i>mental ray custom options</i>
mental ray Shaders	<i>Material Shaders</i> <i>Photon Shaders</i> <i>Shadow Shaders</i> <i>Volume Shaders</i>

Hypershade UI	<i>Photon Volume Shader Contour Shader Managing the UI and work areas Bins Custom Tabs</i>
Building complex shading networks	<i>Demo shader development using Hypershade. Create a shader with the complexity level of a vintage wine glass with decal or helmet with team logo and surface abrasions, etc...</i>
Hypershade>Edit Menu Options	<i>Explain and demonstrate options</i>

Materials/Textures II

2D Texture Mapping Options	<i>Normal Projection Stencil</i>
UV Mapping	<i>Using the Show Manipulator Tool to edit UV projections</i>
Confirming UV placement	<i>Create UVs> Assign Shader to Each Projection</i>
UV Texture Editor UI	<i>UI Navigation UV Texture Editor Menu Bar (All Options)</i>
UV Sets	<i>Discuss concept</i>
Describe the UV creation/editing workflow with a demonstration that takes into account the following	<i>UV Texture Editor and navigation Standard Mapping Options Selection Modes Using the Transform Manipulator Using common UV Editing Tools</i>
Baking Illumination and Color (aka Pre-lighting)	<i>Lecture (concept and uses) Creating bake sets Texture Bake Set Attributes Vertex Bake Set Attributes Convert to File Texture Baking with Global Illumination and Final Gather</i>
Transfer Maps (aka Normal Maps)	<i>Lecture (concept and use) Transfer Maps Dialog Target vs. Source Objects Output Maps</i>
File (Image) Texture Quality	<i>Software Render Options File texture filtering mental ray Texture Filtering (Elliptical Filters)</i>
Texture Memory Management	<i>Block ordered textures (BOT Files)</i>

Global Illumination

Overview of Global Illumination in mental ray

Using Global Illumination
GI Terms and Techniques
Call-up complex renderings that showcase GI-related features to illustrate each component.
Basic demonstration of GI workflow and feature-set
Show examples that illustrate difference between “fakeosity” and real GI

Caustics and Global Illumination (Dropdown)

Enabling GI
Rebuild Photon Maps (discuss advantages)

Overrides (Dropdown)

Discuss (uses)
Enabling Overrides
Global / Local Workflow

HDRI / IBL

HDRI Lecture (concept and uses)
Image-Based Lighting (Dropdown)
Image-Based Lighting node attributes
IBL with HDRI (Demonstrate workflow)
Approximation Editor

Topic

Sub-Topic

Content

Animation I

Lecture – Animation Techniques

Theory of traditional 2D Animation techniques for example
Exaggerated and Secondary Motion
Anticipation
Squash and Stretch

Kayframing (Process)

In-Betweens (concept)
Demo adding and removing in-betweens
Breakdowns (concept)
Demonstrate animating using Keys and Breakdowns
Ghosting / Unghosting (Object Display Dropdown in Attribute Editor)

Graph Editor

Scale Keys
Add keys vs. Insert keys
Lattice Deform Keys
Snap Keys
Change Curve Color

	<i>Curves>Spreadsheet...</i>
	<i>Weighted vs. Non-Weighted Tangents (concept)</i>
	<i>Lock/Free Tangent Weight</i>
	<i>Switching to Dope Sheet/Trax Editor</i>
Dope Sheet	<i>Clearly identify workflow for Dope Sheet and Curve Editor. For example, using Dope Sheet for Timing and Curve Editor for Animation (time space)</i>
	<i>Explanation of UI</i>
	<i>Demonstrate timing process</i>
Trax Editor	<i>Lecture (non-linear animation)</i>
	<i>Explanation of UI</i>
	<i>Demonstrate clip editing process</i>
Audio	<i>Import Audio File</i>
	<i>Enabling Timeline display</i>
	<i>Audio Attributes>Offset</i>
	<i>Audio Playback</i>
Set Driven Key	<i>Discuss Concept (Driver vs. Driven)</i>
	<i>Explain UI</i>
	<i>Demonstrate workflow</i>
Animation Expressions	<i>Lecture (concept)</i>
	<i>Expression Editor UI</i>
	<i>"Time" & "Frame" keywords</i>
	<i>Demonstrate using examples</i>
Preferences>Animation	<i>Auto Key</i>
	<i>Euler vs. Quaternion (Lecture)</i>
	<i>Rotation Interpolation</i>
	<i>Tangents</i>
	<i>Animation Blending</i>

Animation II

Motion Path-based animation	<i>Flow Path Object (Demo)</i>
	<i>Animation Snapshot (Demo)</i>
Baking animations	<i>Usage</i>
Constraints	<i>Point</i>
	<i>Orient</i>
	<i>Parent</i>
	<i>Geometry</i>
	<i>Normal</i>
	<i>Tangent</i>
	<i>Discuss importance of weighting constraints</i>
	<i>Set Rest Position</i>

	Deformers	<ul style="list-style-type: none"> <i>Sculpt</i> <i>Cluster</i> <i>Jiggle</i> <i>Wire</i> <i>Wrap</i> <i>Changing Deformation Order</i> <i>Deformation Sets</i> <i>Editing deformation sets with Paint Set Membership Tool</i>
	Full Body IK	<ul style="list-style-type: none"> <i>Intro FBlK (Full Body IK)</i> <i>Definition and usage</i>
<i>Topic</i>	<i>Sub-Topic</i>	<i>Content</i>
Effects		
	Particle Attributes	<ul style="list-style-type: none"> <i>Explanation of various particle attributes</i> <i>Lifespan Mode</i> <i>Lifespan Random</i> <i>Start Frame</i> <i>Lifespan</i> <i>Max Count</i>
	Emitter Attributes	<ul style="list-style-type: none"> <i>Explanation of various emitter attributes</i> <i>Rate</i> <i>Max / Min Distance</i> <i>DirectionXYZ</i> <i>Spread</i> <i>Speed</i> <i>Away from Center</i> <i>Away from Axis</i> <i>Around Axis</i>
	Particle Shape Render Attributes	<ul style="list-style-type: none"> <i>Adding attributes for Current Render Type (concept)</i> <i>Demonstrate process</i>
	Goals	<ul style="list-style-type: none"> <i>Create Goals</i> <i>Goal weights</i> <i>Goal smoothness</i> <i>Conserve</i>
	Particle Collision Events	<ul style="list-style-type: none"> <i>Particle Collision Event Editor</i> <i>Explanation of UI</i> <i>Creating & Modifying Events</i>
	Caching particle simulations	<ul style="list-style-type: none"> <i>Discuss concept, types, and uses</i> <i>Memory Caching</i> <i>Create Particle Disk Cache</i>

	<i>dynGlobals node</i>
	<i>Oversampling (concept)</i>
	<i>Demonstrate example using memory and/or disk caching</i>
Particle rendering	<i>Hardware Render Buffer UI</i>
	<i>Multi-pass render options</i>
	<i>Matte opacity</i>
Pre-built Effects	<i>Create Smoke</i>
	<i>Create Shatter</i>
	<i>Create Curve Flow</i>
	<i>Create Surface Flow</i>
2d Paint Effects	<i>2d Brushes (Demo examples)</i>
	<i>Dynamics simulations with Paint FX</i>
	<i>Compositing with Paint FX</i>
3d Paint Effects	<i>3d Brushes (Demo examples)</i>
	<i>Dynamics simulations with Paint FX</i>
	<i>Paint FX to Polygons, NURBS, Curves</i>
	<i>Paint FX and mental ray</i>
	<i>Compositing with Paint FX</i>
Volumetric / Material Effects	<i>ShaderGlow</i>
	<i>Env Fog</i>
	<i>Particle Cloud</i>
	<i>Volume Fog</i>
	<i>Volume Shader</i>
Light Effects	<i>Light Fog</i>
	<i>Light Glow</i>
	<i>Creating Glows, Halos, and Lens Flares using Optical FX Utility</i>

IK / Rigging

Hierarchical animation	<i>Discuss advantages</i>
	<i>Demonstrate basic example</i>
IK Rig	<i>Lecture (armature example)</i>
Creating skeletons	<i>Complex joint hierarchies</i>
	<i>Scaling joints</i>
	<i>Cartoon rigs</i>
Parenting geometry to skeletons	<i>Demonstrate process</i>
IK Handles	<i>SC IK (single chain)</i>
	<i>RP IK (rotate plane)</i>
	<i>Spline IK</i>
IK/FK blending	<i>Definition and usage</i>
FBIK	<i>Lecture (process & workflow)</i>
	<i>Preparing the character</i>

	<i>Preparing the skeleton</i>
	<i>Create the FBlK system (aka Characterize FBlK)</i>
	<i>Posing FBlK</i>
	<i>Set FBlK Keys</i>
Constraints	<i>Pole vector – preventing flipping joints</i>
Building character rigs	<i>Create an example, such as a leg and foot or body and tail utilizing:</i>
	<i>Channel control</i>
	<i>Set driven key</i>
	<i>Custom attributes</i>
	<i>Hypergraph</i>
	<i>Custom control objects</i>
	<i>Deformation order</i>
Skinning	<i>Rigid binding</i>
	<i>Smooth binding</i>
	<i>Weight normalization</i>
	<i>Demonstrate the general workflow and concept of skinning as it relates to character rigging</i>
Editing Skin Weights	<i>Edit Membership (Tool options)</i>
	<i>Flexors</i>
	<i>Influence objects</i>
	<i>Paint Skin Weights Tool</i>
	<i>Copy skin weights</i>
	<i>Component Editor – Rigid Skins , Smooth Skins</i>
	<i>In-depth demonstration of workflow including skinning and editing skin weights.</i>
Blend Shapes	<i>Lecture (concept)</i>
	<i>Targets</i>
	<i>In-between targets</i>
	<i>Blend Shape deformation order</i>
	<i>Paint Blend Shape Weights Tool</i>
	<i>Add Blend Shape manipulator (custom control object)</i>
	<i>Demonstrate Process</i>
Preferences>Kinematics	<i>Inverse Kinematics</i>

Dynamics

Dynamic Relationships Editor	<i>Explanation of UI</i>
	<i>Demonstrate workflow</i>
Rigid Bodies	<i>Active vs. Passive rigid bodies</i>

Rigid Body constraints	<i>Combining keyframing with rigid body dynamics</i> <i>Nail Constraint</i> <i>Pin Constraint</i> <i>Spring Constraint</i> <i>Hinge Constraint</i> <i>Barrier Constraint</i>
Rigid Body optimization	<i>Rigid constraints and mass (concept)</i> <i>Surface Interpenetration</i> <i>Surface Normals</i> <i>Stand-in objects</i>
Rigid Bodies and Particles	<i>geoConnector node</i> <i>Collision Layers</i>
Soft Bodies	<i>Creation Options</i> <i>Soft Body Goals</i> <i>Goal PP</i> <i>Springs</i> <i>Paint Soft Body Weights Tool</i>
Caching dynamic simulations	<i>Discuss concept, types, and uses</i> <i>Memory Caching</i> <i>Create Particle Disk Cache</i> <i>dynGlobals node</i> <i>Oversampling (concept)</i> <i>Demonstrate example using memory and/or disk caching</i>
Preferences>Dynamics	<i>Dynamics</i>

Scripting

Macro Recording	<i>As viewed as an introduction to viewing a scripting language</i>
Script Editor UI	<i>Explanation of UI</i> <i>Loading, Sourcing, and Saving Scripts</i> <i>Executing Commands</i> <i>Show Stack Trace</i> <i>Echo All Commands</i>
Getting Help	<i>Discuss the importance of navigating within the Help Files</i> <i>Show the Maya help for a command</i> <i>Learning by examining Maya's own Script Files</i>
Scripting Reference	<i>MEL Command Reference</i> <i>Node and Attribute Reference</i>
Getting and Setting Object Properties (Transform Node)	<i>MEL Command Syntax</i> <i>Attribute Names (overview)</i>

		<i>getAttr</i>
		<i>setAttr</i>
		<i>Demonstrate through examples</i>
Executing Simple Commands		<i>Creating objects with MEL (sphere command)</i>
		<i>Introduce flags (concept)</i>
		<i>Selecting objects with MEL</i>
		<i>Demonstrate through examples</i>
Connecting Object Properties		<i>connectAttr</i>
		<i>Demonstrate through examples</i>
Example: Creating Objects		<i>Use the createNode command with relevant flags to make the transform, shape, and input node for a primitive object. Then, connect the input and shape nodes to create and display the object's wireframe in a scene. Finally, connect the shape node to the initial shading group to view the object in shaded mode.</i>
Example: Creating Interfaces		<i>Use the window command to create new UI elements. Then add controls such as buttons and sliders to the UI.</i>
Basic MEL Scripting		<i>Lecture (principles and process)</i>
		<i>Developing good MEL style</i>
Introduction to Values and Variables		<i>Integers and floating point numbers</i>
		<i>Strings</i>
		<i>Variables</i>
		<i>Assigning values to variables and attributes</i>

<i>Topic</i>	<i>Sub-Topic</i>	<i>Content</i>
Scene Assembly		
	Render Elements	<i>Lecture on why you use Render Elements. Introduce combustion for compositing</i>
	<i>Elements / Passes</i>	<i>Beauty (concept)</i>
		<i>Alpha</i>
		<i>Diffuse</i>
		<i>Specular</i>
		<i>Shadows</i>
		<i>Z-Depth (Render Settings Dialog)</i>
		<i>GI</i>
		<i>Hardware particles</i>
	Import / Export	<i>File Format import/export considerations</i>
		<i>Data types and known issues</i>

File Referencing

Unloading/reloading

Namespaces

Edits, List referenced edits

Clean Reference

File>Recent...

Files

Increments

Projects

**Settings/Preferences>Plug-In
Manager**

Loaded vs. Auto Load

Getting Plug-in Information

Demo loading / unloading Plug-Ins