

**CSCI-305 Animation & 3D Programming**  
**Assignment Schedule**  
 Fall 2017

Topic	Online Tutorials	Text Resources
<b>A1 – Sep 8</b>		
Setting Up Your Work Environment		
JavaScript, HTM, and CSS		
Creating a Basic Scene	B1. Creating a Basic Scene Debugging a Scene	LB1
What's a Scene?	B14. Environment (background color) A36. Render Scene on a PNG M8. Creating a Custom Loading Screen	LB1 BE2 LB3
Lights & Shadows	B5. Lights B16. Shadows GB7. Lights	
<b>A2 – Sep 15</b>		
Cameras	B4. Cameras GB3. Standard Cameras G11. Additional Cameras M9. Customizing Camera Inputs A17. How to use Multi-Views A26. Layermasks and Multi-Cam Textures	
Coordinate Systems	M1. Position, Rotate, Translate and Spaces GB5. Position and Rotation O2. How Rotations and Translations Work GA4. Translate and Rotate Details B6. Position, Rotation, Scaling GA7. Euler Angles and Quaternions GA8. Applying Rotation Conventions	LB3 LB10
<b>A3 – Sep 22</b>		
How Meshes are Rendered	A28. Transparency and How Meshes are Rendered GA10. Facet Normals A35. How to use Facet Data A32. How to use EdgesRenderer M4. Caching Resources in IndexedDB	
Fixed Shapes	GB4. Standard Shapes B20. Mesh CreateXXX Methods with Options Parameter B15. Height Map M2. Using PolygonMeshBuilder	
Constructive Solid Geometry (CSG)	<a href="https://github.com/CraigFeldspar/BabylonCSG">https://github.com/CraigFeldspar/BabylonCSG</a> <a href="https://www.babylonjs.com/demos/csg/">https://www.babylonjs.com/demos/csg/</a>	
<b>A4 – Sep 29</b>		
Tags	A23. How to use the Tags System	
Parametric Shapes	B20. Mesh CreateXXX Methods with Options Parameter B17. Parametric Shapes A11. How to use Curve3 A18. How to use Path3D M10. Ribbon Tutorial	

	GA2. Ribbons in Detail GA3. Mathematics of Ribbons	
Customizing Meshes	GA9. Creating Custom Meshes A6. How to Merge Meshes M6. Using Decals A5. How to dynamically morph a mesh GA11. Updating Vertices	
Instances and Clones	A14. How to use Instances LB2. (instances and clones) See Extensions	

#### **A5 – Midterm – Oct 6**

Standard Materials	B3. Materials GB8. Colors and Textures A33. How to use Blend Modes A13. How to use FresnelParameters A37. Using logarithmic depth buffer GI8. Sky	LB5
How Materials Work	A41. How materials work	
Textures	B19. CreateBox per face colors and textures M3. Advanced Texturing (see Material Extensions) GA13. Reflections and Refractions A34. How to use Reflection Probes M7. Using Parallax Mapping LB5. Textures, draw calls	BE4
Multi-materials	<a href="https://www.eternalcoding.com/?p=283">https://www.eternalcoding.com/?p=283</a>	
Applying Materials to Facets	GA14. Applying Materials to Facets	
Procedural Textures	A20. How to use Procedural Textures (see Procedural Texture Extensions)	

#### **A6 – Oct 13**

Sprites	B8. Sprites	
Particle Systems	O3. How to Use the Solid Particle System B13. Particles	LB13

#### **A7 – Oct 27**

Lens Flares	A15. How to use Lens Flares	
Interactions	A7. How to use Actions B11. Picking Collisions	LB9 LB11
Playing Sounds and Music	O5. Playing Sounds and Music	BE6
Animations	B7. Animations GB9. Introduction to Animation GB10. Combining Animations	LB8 BE9

#### **A8 – Nov 3**

Morph Targets	A10. How to use Morph targets	
Skeleton & Bones	A9. How to use Bones and Skeletons LB12. Skeleton and bones	
Collisions	B9. Cameras, Mesh Collisions, and Gravity B10. Intersect Collisions – mesh B12. Raycasts	LB3 BE5
Physics	O4. Physics Engine – Basic Usage	LB10 BE5

#### **A9 – Nov 10**

Highlight Layer	M11. Highlight Layer	
Shaders	GA15. Shaders Overview GA16. Putting Shader Code in BJS GA17. Shader Material GA18. A Vertical Wave with Shader Code B18. Supporting Fog with ShaderMaterial GA19. Fireworks with Shader Code	LB13
<b>A10 – Nov 17</b>		
PostProcesses	A19. How to use PostProcesses A21. How to use PostProcessRenderPipeline BE8. Postprocesses + A29. Using depth-of-field and other lens effects A31. Using the Volumetric LightScattering post-process A39. Using the standard rendering pipeline A40. Using the default rendering pipeline A30. Using the SSAO redering pipeline See Extensions	
<b>A11 – Dec 1</b>		
Babylon.GUI: 2D and 3D GUI	O9. Babylon.GUI: How to create 2D and 3D UI	
Importing Scenes and Meshes	A8. How to use AssetsManager (See also Exporters)	BE3 LB6 LB7
<b>A12 – Dec 8</b>		
Scene Optimization	A38. Optimizing your scene M5. Using the Incremental Loading System M4. Caching Resources in IndexedDB A22. How to use SceneOptimizer A27. Optimizing Your Scene with Octrees A16. How to use LOD A25. In-Browser Mesh Simplification (Auto-LOD)	LB14

### Prefix Legend

#### Official Babylonjs Online Tutorials

B – doc.babylonjs.com/tutorials – The Play Pen Tutorials  
M – doc.babylonjs.com/tutorials – Mid-Level Tutorials  
A – doc.babylonjs.com/tutorials – More Advanced Features  
O – doc.babylonjs.com/overviews - Overviews

#### Alternative Online Tutorials

GB – [babylonjsguide.github.io/basics.html](http://babylonjsguide.github.io/basics.html) - Basics  
GI - [babylonjsguide.github.io/intermediate.html](http://babylonjsguide.github.io/intermediate.html) - Intermediate  
GA - [babylonjsguide.github.io/advanced.html](http://babylonjsguide.github.io/advanced.html) – Advanced

#### Text Resources

LB – Learning Babylon.JS by Julian Chenard  
BE – Babylon Essentials by Julien Moreau-Mathis