Course Description:
This course will survey the tools and techniques to successfully create a spectrum of effects-based animation in computer-generated imagery (CGI), using Autodesk Maya animation software. Equal in importance but complementary to character animation, effects animation has a long tradition of creating environmental performances such as water, fire, explosions, and destruction in film. The course will expose the advancing 3d animation student with all aspects of digital effects animation, including particles, dynamics, and fluids. The course will encompass a series of hands-on exercises, so a prior basic working knowledge of Maya or other 3d application is essential. Exposure to Side Effects Houdini, a leading effects 3D application, is also provided from additional workshops.

Recommended Prior Courses:
CTAN 462, Visual Effects, or CTAN 452, Introduction to 3D Computer Animation

Course Length:
15 weeks, meeting once a week, three hours each class meeting.

Optional Books:
"Elemental Magic: The Art of Special Effects Animation", Joseph Gilland, Focal Press 2009. ($32.00)
"Maya Studio Projects: Dynamics", Todd Palamar, Sybex, 2009. ($30.00)

Supplemental Educational DVD's:

Supplemental Online Tutorials:
"Maya Particle Effects", Audri Phillips, Lynda.com (free to USC students)
"Maya 2011: Creating Natural Environments", Aaron Ross, Lynda.com (free to USC students)
"Maya Dynamics Category", DigitalTutors.com

Software Used:
Autodesk Maya 2012
Side Effects Houdini

Grading Breakdown:
Participation @10%
Weekly Assignments @30%
Final Project @30%
Final Exam 30%
The final project consists of (1) scene animation, reflecting a myriad of effects animation. The work will serve to demonstrate the range of techniques conveyed throughout the class, and allows the student to develop polished, elaborate work for their showreel.

Weekly assignments are due in the following class from when they are assigned.

Final exam is multiple choice in format.

**Schedule:**

**Week 1- Jan 14: Introduction to Effects Animation**

Traditional Methods  
Use in Feature Animation  
Use in Feature Film VFX  
Intro to Maya Dynamics

*In-Class Exercises: Particle Demos*

*Assignment: Show Film Samples*

**Week 2- Jan 21: MLK Day- NO CLASS**

**Week 3- Jan 28: Maya Dynamics**

Particles and Emitter Review  
Software Rendering  
Hardware Rendering

*In-Class Exercises: Particle Demos*

*Assignment: Create Rain*

**Week 4- Feb 4: Maya Dynamics**

Collision Events  
Rain  
Texture Emission  
Sprites

*In-Class Exercises: Particle Demos*

*Assignment: Create Rain Collisions*

**Week 5- Feb 11: Maya Dynamics**

Sprite Wizard  
Geometry Instancing  
Particle Emission from Particles  
Particle Instancer  
Fields  
Goals

*In-Class Exercises: Particle Demos*
Assignment: Create Sprite Scene

Week 6- Feb 18: President's Day- NO CLASS

Week 7- Feb 25: Maya Expressions
Particle Summation Scene- Volcano
Expressions and MEL
Creation vs Runtime

In-Class Exercises: MEL Scripting, Bird Flapping

Assignment: Animate w/ Expressions

Week 8- Mar 4: Maya Dynamics
Rigid Body Dynamics
RBD Particle Interaction
Constraints

In-Class Exercises: Dynamics Demos

Assignment: Create Rube Goldberg Device

Week 9- Mar 11: Maya Dynamics
Springs
Soft Body Dynamics
Caching

In-Class Exercises: Dynamics Demos

Assignment: Create Soft Body Scene

Mar 18: Spring Break Week, NO CLASS

Week 10- Mar 25: Maya Nucleus System
Shatter
nParticles
nEmitters

In-Class Exercises: Nucleus Demos

Assignment: Create nParticle Scene

Week 11- Apr 1: nCloth
nCloth Interactions
Flags
Clothing

In-Class Exercises: nCloth Demos
Assignment: Create nCloth Scene

**Week 12- Apr 8: Maya Fluids**

Fluid Containers  
Presets  
Clouds  

*In-Class Exercises: Fluids Demos*

Assignment: Create Fluids Scene

**Week 13- Apr 15: Maya Fluids**

Geometry Interaction  
Explosions  
Fire  

*In-Class Exercises: Fluids Demos*

Assignment: Create Fluids Scene

**Week 14- Apr 22: Maya Paint Effects**

Presets  
Tubes  
Strokes  
Custom Brushes  

*In-Class Exercises: Paint FX Demos*

Assignment: Create PaintFX Scene

**Week 15- Apr 29: Maya Hair, Fur**

Maya Hair Presets  
Custom Hair  
Maya Fur Presets  
Custom Fur  
Grass  

*In-Class Exercises: Hair, Fur Demos*

Assignment: Create Hair Scene

**Wed May 8, 2-4pm, Final Exam, Submission of Final Project, TBD**

**STUDENTS WITH DISABILITIES:**

Any student requesting academic accommodations based on a disability is required to register
with Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Please be sure that the letter is delivered to the Professor as early in the semester as possible. DSP is located in STU 301 and is open 8:30 a.m. - 5:00 p.m., Monday through Friday. The phone number for DSP is (213) 740-0776.

MISSING AN EXAM, INCOMPLETES:

The only acceptable excuses for missing an exam or taking an incomplete in the course are personal illness or a family emergency. Students must inform the professor before the exam and present verifiable evidence in order for a make-up to be scheduled. Students who wish to take incompletes must also present documentation of the problem to the instructor or teaching assistant before final grades are due and are available only after the week 12 withdrawal deadline.

ACADEMIC INTEGRITY:

USC seeks to maintain an optimal learning environment. General principles of academic honesty include the concept of respect for the intellectual property of others, the expectation that individual work will be submitted unless otherwise allowed by an instructor, and the obligations both to protect one's own academic work from misuse by others as well as to avoid using another's work as one's own. All students are expected to understand and abide by these principles. Scampus, the Student Guidebook, contains the Student Conduct Code in Section 11.00, while the recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS/gov/. Students will be referred to the Office of Student Judicial Affairs and Community Standards for further review, should there be any suspicion of academic dishonesty. The Review process can be found at: http://www.usc.edu/student-affairs/SJACS/.