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 2015

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 13: 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 20: Maya Dynamics**
Particles and Emitter Review
Software Rendering
Hardware Rendering
*In-Class Exercises: Particle Demos*
*Assignment: Create Rain*

**Week 3- Jan 27: Maya Dynamics**
Collision Events
Rain
Texture Emission
Sprites
*In-Class Exercises: Particle Demos*
*Assignment: Create Rain Collisions*

**Week 4- Feb 3: Maya Dynamics**
Sprite Wizard
Geometry Instancing
Particle Emission from Particles
Particle Instancer
Fields
Goals
*In-Class Exercises: Particle Demos*
*Assignment: Create Sprite Scene*

**Week 5- Feb 10: Maya Expressions**
Particle Summation Scene- Volcano
Expressions and MEL
Creation vs Runtime
*In-Class Exercises: MEL Scripting, Bird Flapping*
*Assignment: Animate w/ Expressions*

**Week 6- Feb 17: Maya Dynamics**
Rigid Body Dynamics
RBD Particle Interaction
Constraints
*In-Class Exercises: Dynamics Demos*
*Assignment: Create Rube Goldberg Device*
Week 7- Feb 24: Maya Dynamics
Springs
Soft Body Dynamics
Caching
*In-Class Exercises: Dynamics Demos*
*Assignment: Create Soft Body Scene*

Week 8- Mar 2: Maya Nucleus System
Shatter
nParticles
nEmitters
*In-Class Exercises: Nucleus Demos*
*Assignment: Create nParticle Scene*

Week 9- Mar 9: nCloth
nCloth Interactions
Flags
Clothing
*In-Class Exercises: nCloth Demos*
*Assignment: Create nCloth Scene*

Mar 16: NO CLASS- SPRING BREAK

Week 10- Mar 23: Maya Fluids
Fluid Containers
Presets
Clouds
*In-Class Exercises: Fluids Demos*
*Assignment: Create Fluids Scene*

Week 11- Mar 30: Maya Fluids
Geometry Interaction
Explosions
Fire
*In-Class Exercises: Fluids Demos*
*Assignment: Create Fluids Scene*

Week 12- Apr 6: Maya Paint Effects
Tubes
Strokes
Custom Brushes
*In-Class Exercises: Paint FX Demos*
*Assignment: Create PaintFX Scene*

Week 13- Apr 13: Maya Hair, Fur, BiFrost
Maya Hair Presets
Custom Hair
Custom Fur
Grass
*In-Class Exercises: Hair, Fur Demos*
*Assignment: Create Hair Scene*
Academic Conduct
Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Section 11, Behavior Violating University Standards: https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-sanctions/. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct/.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the Office of Equity and Diversity http://equity.usc.edu/ or to the Department of Public Safety http://capsnet.usc.edu/department/department-public-safety/online-forms/contact-us. This is important for the safety whole USC community. Another member of the university community – such as a friend, classmate, advisor, or faculty member – can help initiate the report, or can initiate the report on behalf of another person. The Center for Women and Men http://www.usc.edu/student-affairs/cwm/ provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other

Support Systems
A number of USC’s schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the American Language Institute http://dornsife.usc.edu/ali, which sponsors courses and workshops specifically for international graduate students. The Office of Disability Services and Programs http://sait.usc.edu/academicsupport/centerprograms/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, USC Emergency Information http://emergency.usc.edu/will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other

Disruptive Student Behavior
Behavior that persistently or grossly interferes with classroom activities is considered disruptive behavior and may be subject to disciplinary action. Such behavior inhibits other students’ ability to learn and an instructor’s ability to teach. A student responsible for disruptive behavior may be required to leave class pending discussion and resolution of the problem and may be reported to the Office of Student Judicial Affairs for disciplinary action.