CTAN 462 Visual Effects (2 units)
Fall 2013 – RZC117, Tuesday nights, 7:00-10:00pm ; Lab Friday 10am-1pm, RZC117

Instructor : Darren Kiner; dkiner@usc.edu

Student Assistant: Jason Ronzani; ronzani@usc.edu

Course Description:
This course will survey contemporary concepts and approaches to production in the current state of film and video effects work. Digital and traditional methodologies will be covered, with a concentration on digital exercises illustrating modern techniques.
The course is taught by Darren Kiner, a very experienced CGI Lighting Artist and Supervisor. Darren has worked both in visual effects and feature animation, on films like Aladdin, Iron Giant, Chicken Little, Charlie Wilson's War, Black Swan and recently on Green Lantern.

Prerequisites:
None mandatory, but basic Maya literacy helpful. Familiarity with computers essential.

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

Required Book:
"Special Effects: The History and Technique" (2nd edition), Richard Rickitt, Billboard Books, 2007 ($47.50).
http://www.amazon.com/Special-Effects-Technique-Richard-Rickitt/dp/0823084086/ref=sr_1_1?s=books&ie=UTF8&qid=1305602698&sr=1-1

Highly Recommended Book:
"Digital Compositing for Film and Video", Steve Wright, 3rd Edition, 2010. ($35.85)
http://www.amazon.com/Digital-Compositing-Film-Video-Third/dp/024081309X/ref=sr_1_1?ie=UTF8&s=books&qid=1305602599&sr=1-1

Optional Books:
"The Art of Maya", by Autodesk, 4th Edition. ($30.85)
http://www.amazon.com/Art-Maya-Introduction-Computer-Graphics/dp/189717747X/ref=sr_1_1?s=books&ie=UTF8&qid=1305602665&sr=1-1

"The Art and Science of Digital Compositing" (2nd Edition), by Ron Brinkman ($52.46)
http://www.amazon.com/Art-Science-Digital-Compositing-Second/dp/0123706386/ref=sr_1_1?s=books&ie=UTF8&qid=1305602342&sr=1-1

Further Reading:
"Digital Lighting and Rendering" by Jeremy Birn ($35.00)
"The Visual Story", Bruce Block, Focal Press, 2001. ($25.00)
"Introducing Maya 6, 3D for Beginners", Dariush Derakhshani ($26.00)
"Light- Science and Magic", by Fil Hunter. ($32.00)
"The Invisible Art: The Legends of Movie Matte Painting" by Craig Barron
"Visual Effects Cinematography", Zoran Perisic, Focal Press, 2000. ($32.00)
"From Word To Image", Marcie Begleiter, Michael Weise Productions, 2001. ($19.00)
"Digital Storytelling, the Narrative Power of VFX in Film", Shilo McClean, MIT Press, 2007

Grading Breakdown:
Class Project: 50% (Required tasks to complete: Modeling, Texturing, Animating, Lighting, Rendering, Rotoscoping, and Compositing of UFO over LA plates)
-15% Modeling and texturing – Due Oct 29th (Week 10)
-15% Animating and Lighting – Due Nov 26th (Week 14)
-20% Rendering, Rotoscoping and Compositing – Due Dec 17th
(entire project due before taking final exam)

Quiz (Midterm): 10% - Nov 12th (Week 12)
Final Exam: 30% - Dec 17th
Class Attendance: 10%

Class Time: 3 hrs / week
Computer Lab Time: 3 hrs/ week
Addition Time Required: 3 hrs / week

Computer Programs Used:
Maya 2011, Mental Ray, Nuke 6.0, Boujou 4.0, Photoshop CS5,

Very important: Bring a new portable hard drive (at least 100 GB) with you to every class and lab session!

Week 1 (Tuesday, August 27th) : History and Origins of Special Effects in Film
Last 100 Years
Melies, Griffith
Case Studies:
Metropolis
Just Imagine
Things To Come
Ray Harryhausen
50's and 60's
2001
Star Wars/ Lucas/ ILM
Blade Runner
Fifth Element
Gladiator
The Phantom Menace
Present Day

Screening: "Reel Image/ Digital Filmmaking"

Lab Time: Friday, August 30th, Get acquainted with Maya

Reading Assignment: "Special Effects", Ch1, p 8-27

Week 2 (Tuesday, September 3rd): Practical Methodologies Survey
Historic Effects Practices:
In-Camera Technique
Use of Mirrors and Projections
Use of Miniatures, Static and Action
Use of Stagecraft, Sets and Cameras
Matte Painting
Extractive Screens
Optical Printing Precedence
Introvision
Motion Control
Pyrotechnics and Explosions
Creating Weather Effects
Screening: Excerpts from "Things To Come"

Lab time: Friday, September 6th, Get acquainted with Boujou

Reading Assignment: "Special Effects", Ch 1, p. 28-47

Week 3 (Tuesday, September 10th): Modern Effects Facilities Survey
Modern Digital Workflow
Modern Effects Facility
Integration w/ The Film Process
EFX Facility Staff Structure
Chain of Command/ Roles
EFX Production Software
EFX Facility Components
Resource Allocation
Naming Conventions
Production Pipeline Diagrams
Color Space Basics
Lin/ Log
LUT's
Gamma Pipeline
Effects Work Scheduling

Screening: "The Making of Visual Effects in Pearl Harbor"

Lab time: Friday, September 13th, Get acquainted with Nuke

Reading Assignment: "Special Effects", Ch 2, p. 48-81

Week 4 (Tuesday, September 17th): 2D Digital Methodologies-Rotoscoping
Class Project Introduced
Roto Matte Extraction
Review of Nuke 5.0
Hands On Session

EXERCISE: Roto Background Plate (Nuke 5.0)
Lab time: Friday, September 20th

Reading Assignment: "Special Effects", Ch 2, p. 82-111

Week 5 (Tuesday, September 24th): 3D Camera Tracking- MatchMoving
Basic Principles, Workflow
Survey Packages
Stage Issues
Lens Distortion Review
Review of Boujou 4.1
Hands On Session

EXERCISE: Track Background Plate (Boujou 4.1)
Lab time: Friday, September 27th

Reading Assignment: "Special Effects", Ch 3, p. 112-140

Week 6 (Tuesday, October 1st): Introduction to 3D CGI
Basic Principles, Workflow
Survey Packages
3D Modeling Basics
Hands On Session

EXERCISE: Model UFO for Maya Scene
Lab time: Friday, October 4th

Reading Assignment: "Special Effects", Ch 3, p. 141-167

Week 7 (Tuesday, October 8th): Intermediate 3D Modeling Technique
Modeling Efficiency
Use of 2D Cards
Polys vs NURBS
Proper Modeling Methodology
Character vs Hard Models
Hands On Session

EXERCISE: Continue UFO Model in Maya
Lab time: Friday, October 11th

Reading Assignment: "Special Effects", Ch 4, p. 168-199

Week 8 (Tuesday, October 15th): CGI Lighting Technique
Review of Classic Cinematic Lighting
Review of CG Methods
Exterior vs Interior Methods
Current vs Future Directions
Direct vs Global Methods
Simulating Radiosity
Simulating Optical Effects
Incandescence Mapping
Case Study: Fifth Element
Hands On Session

EXERCISE: Light UFO for Scene (Maya)
Lab time: Friday, October 18th

Reading Assignment: "Special Effects", Ch 4, p. 200-241

Week 9 (Tuesday, October 22nd): CGI Texturing/ Shading
Shading Models
Procedural vs 2d Mapping
Review of Rendering Applications
Photoshop Techniques
Shader Network Basics
Importance of Specular Mapping
TriPlanar Projections
Weathering Surfaces
Future Directions
Texture Painting Review
Hands On Session

EXERCISE: Paint and Apply Texture Maps for UFO (Photoshop, Maya)
Lab time: Friday, October 25th

Reading Assignment: "Special Effects", Ch 5, p.242-287

Week 10 (Tuesday, October 29th): CGI Animation
Review of Methods
Character vs Effects Animation
Keyframe vs Procedural Techniques
Particle Effects
Hands On Session

EXERCISE: Animate UFOs, Dust Effect in Scene (Maya)
Lab time: Friday, November 1st

Reading Assignment: "Special Effects", Ch 5, p.288-303

Week 11 (Tuesday, November 5th): CGI Camerawork
Visual Composition
Vanishing Points
Perspective Correction
Natural Movement
Proper Camera Setup
Motion Control Rigs
Camera Projection
Hands On Session

EXERCISE: Render Scene Frames (Maya)
Lab time: Friday, November 8th

Extra Credit Reading Assignment: "Special Effects", Ch 7, p. 304-337

Week 12 (Tuesday, November 12th): Introduction to 2D Compositing
Survey of Operations
Pulling Mattes
2D Tracking
Formats
Color Space
Image Manipulation
Handling Disparate Elements
Hands On Session

EXERCISE: Composite UFO into Scene (Nuke)
Lab time: Friday, November 15th

Optional Reading Assignment: "Digital Compositing", Ch 1, p1-14

Week 13 (Tuesday, November 19th): Intermediate 2D Compositing
Nodal Trees
Scripting for Command Line
Using Alpha for Shadowing
Using Particles for Heat Signature

EXERCISE: Composite UFO into Scene (Nuke) including Effects
Lab time: Friday, November 22nd

Optional Reading Assignment: "Digital Compositing", Ch 6, p135-173

Week 14 (Tuesday, November 26th): Advanced Compositing
Survey of Operations
Pulling Mattes
2D Tracking
Formats
Color Space
Image Manipulation
Handling Disparate Elements
Hands On Session

EXERCISE: Finish Class Project!!
Lab time to be rescheduled due to Thanksgiving Holiday!

Week 15 (Tuesday, December 3rd): Intermediate 2D Compositing
Nodal Trees
Scripting for Command Line
Using Alpha for Shadowing
Using Particles for Heat Signature

Lab time: Friday, December 6th

EXERCISE: Composite UFO into Scene (Nuke)

Tuesday, December 10th; Voluntary Review Session

Tuesday, December 17th; (7pm-10pm) Final Exam
Followed by Industry Lecture
Class projects due at beginning of class (before final begins)!!

Attendance:
Attendance at all classes is mandatory, and punctuality is expected. If a student misses a class, they must provide a valid excuse, and they must meet with the instructor to discuss a make-up assignment.

Missing an Exam, Incompletes:
The only acceptable excuses for missing an exam or taking an incomplete in the course are personal illnesses or a family emergency. Incompletes may only be given after the 12th week of the semester. Students must inform the professor before the exam and present verifiable evidence in order for a make-up to be scheduled. Students who take incompletes must also present documentation of the problem to the instructor before final grades are due.

Academic Integrity:
The School of Cinematic Arts expects the highest standards of academic excellence and ethical performance from USC students. It is particularly important that you are aware of and avoid plagiarism, cheating on exams, submitting a paper to more than one instructor, or submitting a paper authored by anyone other than yourself. Violations of this policy will result in a failing grade and be reported to the Office of Student Judicial Affairs. If you have any doubts or questions about these policies, consult "SCAMPUS" and/or confer with the Professor or Department Chair. The Student Conduct Code can be found in Section 11.00. Recommended sanctions are located in Appendix A: http://www.usc.edu/dept/publications/SCAMPUS.gov

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 8:30am – 5:00pm, Monday through Friday. The phone number for DSP is (213) 740-0776.

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.

Rules for Using SCA Computer Labs

1) No food, drinks (including bottled water), gum, or skateboards in the labs, Edit or Sound Edit Suites. Violation of this rule will result in suspension of Lab or Edit Room privileges. Locker area is available for food and drink storage.

2) You must sign in at Front Desk with your Student ID and use station assigned. Any change must be done through Front Desk.

3) If you are having technical problems with your workstation, contact a Tech through the Front Desk or Help Desk.

4) Closing time is strictly enforced. Techs will give warnings when to begin saving. Please do not argue with them.

5) Lab Hours and Supported Hard Drive documents can be found at the Front Desk, Help Desk, and SCA Community.

6) Headphones with 1/4 inch adapters are required at each workstation. SCA does not supply headphones or adapters.

7) Users may be bumped after their station has been vacant for a period of 30 minutes.

8) For locker checkout, fill out locker form in B144. Lock must be approved before locker is assigned.

9) SCA Help Documents are located on each workstation desktop.

10) Please handle all equipment and computers professionally.