CTAN 462 Visual Effects (2 units)
Spring 2015 – RZC 117
Monday nights, 7:00pm-9:50pm; RZC 117; Lab Time: Fridays 1-3:50pm, RZC 117

Instructor: Darren Kiner; dkiner@usc.edu www.darrenkiner.com

Student Assistant: Naifang (Alice) Hu; naifangh@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:
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:
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:

http://www.amazon.com/Art-Science-Digital-Compositing-Second/dp/0123706386/ref=sr_1_1?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 March 23rd (Week 10)
  -15% Animating and Lighting – Due April 20th (Week 14)
  -20% Rendering, Rotoscoping and Compositing – Due May 11th
    (entire project due before taking final exam)

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Quiz (Midterm): 10% - March 23rd (Week 10)
Final Exam: 30% - May 11th
Class Attendance: 10%
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Class Time: 3 hrs / week
Computer Lab Time: 3 hrs/ week
Additional Time Required: 3 hrs / week

Computer Programs Used:
Maya 2015, Mental Ray, Nuke 6.0, Boujou 4.0, Photoshop CC,

Very important: Bring a new portable hard drive (at least 100 GB) with you to every class and lab session!
Week 1 (Monday, Jan 12th): 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, January 16th, Get acquainted with Maya
Reading Assignment: “Special Effects”, Ch1, p 8-27

Week 2 (Monday, Jan 19th): NO CLASS - Martin Luther King Jr Holiday

Lab time: Friday, January 23th, Get acquainted with Boujou
Reading Assignment: “Special Effects”, Ch 1, p. 28-47

Week 3 (Monday, Jan 26th): 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, January 30th, Get acquainted with Nuke
Reading Assignment: “Special Effects”, Ch 2, p. 48-81
Week 4 (Monday, Feb 2nd): 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, February 6th
Reading Assignment: “Special Effects”, Ch 2, p. 82-111

Week 5 (Monday, Feb 9th): 2D Digital Methodologies- Rotoscopying
Class Project Introduced
Roto Matte Extraction
Review of Nuke 5.0
Hands On Session

EXERCISE: Roto Background Plate (Nuke 5.0)

Lab time; Friday February 13th
Reading Assignment: “Special Effects”, Ch 3, p. 112-140

Week 6 (Monday, Feb 16th): NO CLASS - President’s Day Holiday

Lab time; Friday, February 20th
Reading Assignment: “Special Effects”, Ch 3, p. 141-167
Week 7 (Monday, Feb 23rd): 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, February 27th
Reading Assignment: “Special Effects”, Ch 4, p. 168-199

Week 8 (Monday, March 2nd): Introduction to 3D CGI
Basic Principles, Workflow
Survey of Packages
3D Modeling Basics
Hands On Session

EXERCISE: Model UFO for Scene (Maya)

Lab time; Friday, March 6th
Reading Assignment: “Special Effects”, Ch 4, p. 200-241

Week 9 (Monday, March 9th): Intermediate 3D Modeling Technique
Modeling Efficiency
Use of 2D Cards
Poly vs Degree 1 Nurbs vs Degree 3 Nurbs
Proper Modeling Methodology
Character vs Hard Models
Hands On Session

EXERCISE: Continue UFO Model (Maya)

Lab time; Friday, March 13th
Reading Assignment: “Special Effects”, Ch 5, p.242-287

March 16th – NO CLASS – Spring Recess
March 20th – NO LAB – Spring Recess
**Week 10 (Monday, March 23rd): 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 (Maya)

*Lab time; Friday, March 27th*
*Reading Assignment: "Special Effects", Ch 5, p.288-303*

**Week 11 (Monday, March 30th): 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, April 3rd*
*Optional Reading Assignment: "Special Effects", Ch 7, p. 304-337*
Week 12 (Monday, April 6th): CGI Animation
Review of Methods
Character vs Effects Animation
Keyframe vs Procedural Techniques
Dynamic Simulations
Particle Effects
Hands On Session

EXERCISE: Animate UFOs, Dust Effect in Scene (Maya)

Lab time; Friday, April 10th
Optional Reading Assignment: "Digital Compositing", Ch 1, p1-14

Week 13 (Monday, April 13th): 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, April 17th
Optional Reading Assignment: "Digital Compositing", Ch 6, p135-173

Week 14 (Monday, April 20th): 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 April 23rd
**Week 15 (Monday, April 27th): Intermediate 2D Compositing**
Nodal Trees
Scripting for Command Line
Using Alpha for Shadowing
Using Particles for Heat Signature

EXERCISE: Composite UFO into Scene (Nuke)

**Lab time; Friday, May 1st; Finish Class Project!!**

**Monday, May 4th: Voluntary Final Exam Review Session**

**Monday, May 11th, 7-9:50pm (class time); Final Exam**
Final Exam followed by Industry Lecture
Class Project Due at beginning of class (before final begins)!!
Statement on Academic Conduct and Support Systems

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 resources.

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 technology.
**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.

10) Please handle all equipment and computers professionally.