

CTAN-432 The World of Visual Effects

Spring Semester 2023 Syllabus

Note: Check back for updates.

Thurs 4:30PM – 7:20PM

SCB 104

Units: 2

Craig Barron

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Office Hours: Wed 7:45am to 9:45am.

Friday 7:45am to 9:45am by appt.

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THIS IS AN IN-PERSON CLASS

In accordance with university recommendations, all meetings of this class will be held in person. Students who become ill and need to self-isolate will be supported in their efforts to stay current with classwork and assignments, to the extent possible. Please contact Professor Craig Barron and your SA, Hallie Farmer, at least one hour prior to class start time if you become ill and need to self-isolate. Do not come to class if you are experiencing any symptoms of COVID-19 or other illnesses. Requests for longer term exemptions will be considered on a case-by-case basis, and must be supported by a written accommodation request from the USC Office of Student Accessibility Services (OSAS).

CTAN-432 The World of Visual Effects:

This course will explore the artistry and traditions of cinematic visual effects (VFX) with a particular emphasis on the indispensable nature of illusion in past, present, and future storytelling. We will examine the creative VFX problem-solving process that continues to be a vital part of cinema. From the earliest motion pictures of magician Georges Méliès (who helped introduce storytelling to movies), through the “trick shot” artists of early Hollywood, to the modern “wizards” hailed for conjuring the visions of the modern blockbuster, our class will view specific shots, scenes and entire films, and then discuss their technical and dramatic achievements.

After viewing film clips in class, students will be asked to present their assumptions (and guesses) as to how the illusion was accomplished and how effective (or not) its contribution was to the film. From this beginning, students will then discover how the shots/scenes were created. In addition, we will discuss the reasons why various techniques were employed to achieve the final result.

Each week, students will be assigned reading and viewing homework followed by a discussion in class.

Visual effects are forever tied to the mystery of film and its enduring power to beguile and enchant audiences. Class discussions will culminate in a final exam in which students will be assigned specific films to analyze. Exams will cover technical and dramatic content with a focus on both how visual effects were accomplished and how filmmakers leveraged VFX to tell new stories. Upon the conclusion of this course, each student will have a basic understanding of the mechanics of VFX and its enduring contributions to storytelling.

Please consult the class schedule below, for specific information. Some classes will include distinguished professionals from the entertainment industry, who will share their working experiences. Some content may be omitted or condensed depending on time constraints. The facts and information students need to successfully pass mid-term and final exams will be fully discussed in class.

Your Final Grade is Based On:

Enthusiastic Attendance
Reading and Viewing of Assignments
Dedicated and Heartfelt Discussion and Participation in Class/ Artfully Crafted and Wonderfully Perceptive Written Work
A Sense of Humor

Class Participation – 15%
Homework – 35%
Mid-term – 25%
Final Exam – 25%

Missing homework or assigned projects will not be excused without documented medical or personal emergencies. A late assignment may not be accepted.

The School of Cinematic Arts curriculum relies heavily on in-class participation and interaction between faculty and students. Many of our courses are taught in a collaborative workshop environment and our theoretical lectures are driven through in-depth classroom discussion and analysis. We hold collaboration and constructive criticism as foundational to all of our learning environments and essential to the methodologies of our instruction. Student attendance is not only fundamental, but mandatory for the structure and success of our program for both the individual student and the educational experiences of other students within our community.

There are no unexcused absences - you must document explanations of absences for which you want to be excused. You will receive a reduction of one-third letter grade for each unexcused absence. If you are absent from class more than a couple times, you may not be able to catch up as lectures and class participation

are not so much documented than uniquely crafted by the professor throughout the school year.

Tardiness will not be tolerated, as there is simply too much that needs to be accomplished during the class. There will be one "official" warning for tardiness, and then we will lower grades by one-third letter grade each occurrence.

Course Outline:

***Jan. 12, Class – 1, VFX Pioneers, Introduction of VFX Techniques. Machine Age technology that would power the cinematic art form for nearly a century.**

- Professor's background as film historian and career highlights in VFX.
- Genesis: Early methods and creators of cinematic illusions.
- Illusionist, Georges Méliès.
- Variable frame rates, Glass Shots, Hanging Miniatures and split screens.

Visual Materials to Cover in Class:

1. Those Awful Hats (1909, directed by D.W. Griffith).
2. Safety Last (1923, directed by Sam Taylor), "Trick Danger" clock shot.
3. Modern Times (1936, directed by Charlie Chaplin), Glass shots.
4. Ben Hur (1927, directed by Fred Nieblo), Hanging Miniatures.
5. City Lights (1931), Hanging Miniatures, Open-Air Stage and Painted Backings.

Homework: Watch the film, Hugo (2011, directed by Martin Scorsese). Read: Photoplay April 1926 p.28 "How They Did It" by Frank Williams and answer the following questions in a short paragraph due next class:

<https://archive.org/details/photo29chic/page/n453>

1. What is the title and release date for the first film to use "The Williams' Process"?
2. What was Frank Williams personality on set?

Lab: In class: see the Bell & Howell 2709 Camera – touch 35mm film.

***Jan. 19, Class – 2, Continue Introduction of VFX Techniques and Shot Design.**

Visual materials to cover in class:

1. Sunrise (1927, directed by FW Murnau) - Traveling matte methods in early black and white movies – The Williams' process.
2. Metropolis (1927, directed by Fritz Lang) - Eugen Schüfftan use of the cut-out mirror technique.
3. The Dawn Patrol (1930, directed by Howard Hawks) – Dunning shots.
4. The Lady Killer (1933, Roy Del Ruth) – James Cagney comedy on the rear projection screen.
5. Tarzan Finds a Son (1939, directed by Richard Thorpe) – rear projection at MGM, Africa created on a sound stage in Culver City.

6. Too Hot To Handle (1938, directed by Jack Conway)- actors fly airplanes on a sound stage.
7. The Wizard of Oz (1939, directed by Victor Fleming), making a tornado in miniature.
8. It's a Mad Mad Mad Mad World (1963, directed by Stanley Kramer) – Rear Projection in color, less successful.
9. 2001: A Space Odyssey (1968, directed by Stanley Kubrick) and Superman the Movie (1978, directed by Richard Donner) – a bigger and brighter screen using Front Projection.
10. The Thief of Baghdad (1940, directed by Ludwig Berger, Michael Powell and Tim Whelan) – The Blue Screen traveling matte technique is developed.
11. Rogue One: A Star Wars Story (2016 directed by Gareth Edwards) and Solo: (2018, directed by Ron Howard). Old techniques rediscovered with new technology.
12. Hugo (2011, directed by Martin Scorsese) – VFX shot design development and shot improvement, using “paint overs”.
13. Various movies. Examples of Blue and Green screen process changing to digital.

Quiz: Clip from The Wizard of Oz (1939, directed by Victor Fleming), students turn in short paper at the end of class.

***Jan. 26, Class – 3, Lecture.**

- Review “Wizard of Oz”, discuss quiz from last Class.
- Review first examples of an Academy Award given for visual effects, class discussion on the VFX Oscar nominees for 1939.
- 2023 Oscar Nominations.

Visual materials to cover in Class:

1. Clips from 1939 Oscar nominees; The Rains Came (directed by Clarence Brown), Gone with the Wind (directed by Victor Fleming), Only Angels Have Wings (directed by Howard Hawks), The Private Lives of Elizabeth & Essex (directed by Michael Curtiz), Topper Takes a Trip (directed by Norman Z. McCloud), Union Pacific (directed by Cecil B. DeMille), The Wizard of Oz (directed by Victor Fleming).
2. San Andreas (2015, directed by Brad Peyton) – water, out of control. Compare high-speed photography of water from “The Rains Came” versus CGI particle systems.

Lab: Analysis, did the work in each Oscar nominated film successfully advance the film’s story? Were the illusions effective? What worked about the VFX sequences? What didn’t work? How could the VFX have been more effective?

HOMEWORK: Research the career of stop motion animator Ray Harryhausen for Class-4 class.

***Feb. 2, Class – 4, Here Be Monsters – mechanical, puppets, stop motion and CGI. VFX becomes digital and what is the Uncanny Valley.**

Visual Materials to Cover:

1. Die Nibelungen (1924, directed by Fritz Lang) – onset mechanical dragon.
2. Them (1954, directed by Gordon Douglas) – giant ants that walk with hydraulics.
3. King Kong (1933, Merian C. Cooper)– stop motion animation by visual effects creator Willis H. O'Brien.
4. Ray Harryhausen, montage of his career.
5. Mighty Joe Young (1949, directed by Ernest B. Schoedsack) – Ray Harryhausen learns his craft.
6. Jason and the Argonauts (1963, directed by Don Chaffey) – Talos comes to life through the process of Dynamation.
7. Golden Voyage of Sinbad (1973, directed by Gordon Hessler) – the six-armed statue of Kali.
8. Jurassic Park (1993, directed by Steven Spielberg) – mechanical and CGI dinosaurs. The transition from stop motion to CGI using the Dinosaur Input Device (DID).
9. Lord of the Rings (2001, directed by Peter Jackson) – Balrogs fire creature in CGI.
10. Star Wars Episode I (1999, directed by George Lucas) –VFX becomes digital.
11. The Polar Express (2004, directed by Robert Zemeckis) – motion captured humans.
12. The Curious Case of Benjamin Button (2008, directed by David Fincher) – crossing the uncanny valley.

Homework: Students choose a VFX shot from early cinema to the 1950's for discussion in class.

Be prepared to answer the following questions:

1. How was the shot done – what techniques were used?
2. What does the shot do to advance the narrative of the story?
3. Why is the shot convincing as an illusion - or if it is not, what would have made it better?

Professor will present an example from The Beast From 20,000 Fathoms (1953, directed by Eugene Lourie).

***Feb. 9, Class – 5, Practical onset special effects.**

- The hydraulic car flipper.
- Special Effects that defy gravity.
- Students present homework assignments in class.

Visual Materials to Cover:

1. The Royal Wedding (1951, directed by Stanley Donen).

2. The Amazing Spider-man (2012, directed by Marc Webb).
3. 2001: A Space Odyssey (1968, directed by Stanley Kubrick).
4. Apollo 13 (1995, directed by Ron Howard).

Lab: Students present homework assignment of VFX shots from early cinema to 1950.

Homework: Watch, the film Citizen Kane (1941, directed by Orson Welles).

***Feb. 16, Class – 6, Visual effects created in the studio.**

- Researching how traditional visual effect secrets were achieved.
- The split screen and traveling split screen visual effect.
- Linwood Dunn, Visual Effects Pioneer at RKO Studios and his studio Film Effects of Hollywood.
- Development of Optical Printer effects.
- Special effects, artificial snow in cinema, origins and contemporary usage.

Visual Materials to Cover:

1. The Circus (1927, directed by Charlie Chaplin) the tramp meets a lion with split screen.
2. Citizen Kane (1941, directed by Orson Wells) new ways to tell stories with the optical printer.
3. Bringing Up Baby (1938, directed by Howard Hawks) the split screen “travels”.
4. West Side Story (1961, directed by Robert Wise & Jerome Robbins) making optical transitions.
5. The Shop Around the Corner (1940, directed by Ernst Lubitsch) down feathers for snow effects.
6. It’s a Wonderful Life (1946, directed by Frank Capra) let it snow with fire fighting foam.

Homework: Watch, The Curious Case of Benjamin Button (2008, directed by David Fincher)

***Feb. 23, Class - 7 Discussion of Mid-term Exam.**

Creating performances with VFX, Actors on split screen and CGI humans and subsurface scattering. More explorations of the Uncanny Valley.

Visual Materials to Cover:

1. Phantom of the Opera (1925, directed by Rupert Julian) Lon Chaney’s make up.
2. The Prisoner of Zenda (1937, directed by John Cromwell & WS Van Dyke) split screen, the same actor playing two parts.
- 3 The Parent Trap (1961, directed by David Swift) identical twins created with VFX.
4. The Social Network (2010, directed by David Fincher) Winklevoss twins.

5. Gravity (2013, directed by Alfonso Cuaron) CGI astronauts in Earth's orbit.
6. Lord of the Rings: The Two Towers (2002, directed by Peter Jackson) Gollum.
7. Curious Case of Benjamin Button (2008, directed by David Fincher) a full CGI head for actor Brad Pitt.
8. Rogue One: A Star Wars Story (2016, directed by Gareth Edwards) a deceased actor returns in CGI.
9. Tron: Legacy (2010, directed by Joseph Kosinski) less successful, why?
10. Blade Runner 2049 (2017, Denis Villeneuve) Sean Young.
11. Planet of the Apes (1968, Franklin J. Schaffner) prosthetic make-up by John Chambers.
12. War for the Planet of the Apes (2017, directed by Matt Reeves) and Dawn of the Planet of the Apes (2014, directed by Matt Reeves) Andy Serkis, pioneer of motion capture acting.
13. Avatar (2009, directed by James Cameron) the alien/human stylized Na'vi.
14. The Hobbit: The Desolation of Smaug (2013, directed by Peter Jackson) Smaug comes to life.
15. Cats (2019, directed by Tom Hooper) an example of the Uncanny Valley effect in full force.

***Mar. 2, Class – 8, The Invisible Art. A Lecture on Matte Painting Artists: Albert Whitlock, Peter Ellenshaw and Mathew Yuricich.**

Visual materials to cover in class:

1. Documentary on matte painter, Peter Ellenshaw.
2. Darby O'Gill and the Little People (1959, directed by Robert Stevenson) Mixed scale VFX.
3. Twenty Thousand Leagues Under the Sea (1954, directed by Richard Fleischer) Undersea boat miniature.
4. Al Whitlock matte painting montage
5. Zodiac (2007, directed by David Fincher) San Francisco waterfront as CGI environment.
6. Curious Case of Benjamin Button (2008, directed by David Fincher) – CGI train station and backwards running clock.

Lab: Matte painting on display.

***Mar. 9, Class – 9, Class will take Mid-Term Exam.**

- Lecture on War of the Worlds (1953, directed by Byron Haskin) versus War of the Worlds (2005, directed by Steven Spielberg).
- VFX in the vocabulary of film, past and present.
- How VFX shots are edited in a dramatic sequence.

Visual materials to cover in class:

1. Miniatures and environments for the original War of the Worlds - "WOTW" film

2. Design process for remake “WOTW” film
3. Sequence from Raiders of the Lost Ark (1981, directed by Steven Spielberg) vs. Indiana Jones and the Kingdom of the Crystal Skull (2008, directed by Steven Spielberg).

***Mar. 16, No Class – SPRING BREAK- March 12th-16th.**

***Mar. 23, Class – 10 Guest Lecture- A prominent Visual Effects Supervisor or Producer – discussions on large-scale VFX productions.**

Visual materials to cover in class:
Depending on guest speaker

Homework: Ask students to bring example of a VFX shot created in a film from 1950 to 2023 for discussion in next class.

***Mar. 30, Class – 11,
Catch up on VFX Class Lecture Materials that may have been missed up to now.**

Lab: Students present examples of a VFX shot created from 1950 to 2023.

***Apr. 6, Class – 12, Contemporary CGI Techniques in Visual Effects**

Visual materials to cover:

1. The Matrix (1994, directed by Wachowski's) The bullet time effect, past and future iterations.
2. A brief history of computers in VFX.
3. Global illumination techniques.
4. Motion Capture techniques.

Lab: Students continue to present homework assignment of VFX shots from 1950 to 2023.

***Apr. 13, Class – 13, Aviation VFX in Cinema – Real Aircraft, Miniature and CGI.**

Visual materials to cover:

1. The Dawn Patrol (1938, Edmund Goulding) Actors and Dunning shots.
2. Chain Lightning (1950, Stuart Heisler) Miniatures 1950 style at Warner Bros.
3. The Right Stuff (1983, directed by Philip Kaufman) Miniatures on wires photographed outdoors.
4. The Aviator (2004, directed by Martin Scorsese) Radio controlled, large scale miniatures that fly – end of an era.
5. Red Tails (2012, directed by Anthony Hemingway) and Flight (2012, directed by Robert Zemeckis) CGI aircraft.

Lab: Continue discussion of student homework assignment VFX/1950 to 2023.

***Apr. 20, Class 14 – VFX in Outer Space and The Future of Cinema.**

Visual materials to cover:

1. Woman in the Moon (1929, directed by Fritz Lang) Spacecraft Miniatures.
2. Things to Come (1936, directed by William Cameron Menzies) Hanging Miniatures establish futuristic cities of tomorrow.
3. Forbidden Planet (1956, directed by Fred M. Wilcox) Outer space created on a soundstage.
4. Star Wars (1977, directed by George Lucas) Motion Control Camera technologies.
5. Gravity (2013, directed by Alfonso Cuaron) CGI animation will redefine how some live action films will be made in the future?
6. Interstellar (2014, directed by Christopher Nolan) Re-confirming traditional VFX techniques in the digital age?
7. Lion King (2019, directed by Jon Favreau) Virtual Production Techniques.

***Apr. 27, Class 15 – Final Test Prep and The Future of Cinema.**

Study Days are: April 29-May 2

Final Test Date: Thurs. May 4th, 4:30pm-6:30pm (Confirmed).

Suggested Reading for further research out of class:

VES Handbook of Visual Effects, Visual Effects Society - Focal Press, 2010 Edited by Jeffrey A. Okun, Susan Zwerman. I recommend you purchase at www.amazon.com, as they seem to have the best price.

The Parade's Gone By
by Kevin Brownlow University of California Press ISBN-10: 0520030680

Special Effects – The History and Technique
Richard Rickitt Aurum Press, 2006

An Animated Life – Ray Harryhausen ISBN 10: 0712349197
Melies: Magie et cinema – Malthete & Mannoni (editors)
ISBN 10: 2879005981

Academic Conduct:

The University of Southern California is foremost a learning community committed to fostering successful scholars and researchers dedicated to the pursuit of knowledge and the transmission of ideas. Academic misconduct is in contrast to the university's mission to educate students through a broad array of first-rank academic, professional, and extracurricular programs and includes any

act of dishonesty in the submission of academic work (either in draft or final form).

This course will follow the expectations for academic integrity as stated in the [USC Student Handbook](#). All students are expected to submit assignments that are original work and prepared specifically for the course/section in this academic term. You may not submit work written by others or “recycle” work prepared for other courses without obtaining written permission from the instructor(s). Students suspected of engaging in academic misconduct will be reported to the Office of Academic Integrity.

Other violations of academic misconduct include, but are not limited to, cheating, plagiarism, fabrication (e.g., falsifying data), knowingly assisting others in acts of academic dishonesty, and any act that gains or is intended to gain an unfair academic advantage.

The impact of academic dishonesty is far-reaching and is considered a serious offense against the university and could result in outcomes such as failure on the assignment, failure in the course, suspension, or even expulsion from the university.

For more information about academic integrity see the [student handbook](#) or the [Office of Academic Integrity’s website](#), and university policies on [Research and Scholarship Misconduct](#).

Course Content Distribution and Synchronous Session Recordings Policies

USC has policies that prohibit recording and distribution of any synchronous and asynchronous course content outside of the learning environment.

Recording a university class without the express permission of the instructor and announcement to the class, or unless conducted pursuant to an Office of Student Accessibility Services (OSAS) accommodation. Recording can inhibit free discussion in the future, and thus infringe on the academic freedom of other students as well as the instructor. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Distribution or use of notes, recordings, exams, or other intellectual property, based on university classes or lectures without the express permission of the instructor for purposes other than individual or group study. This includes but is not limited to providing materials for distribution by services publishing course materials. This restriction on unauthorized use also applies to all information, which had been distributed to students or in any way had been displayed for use in relationship to the class, whether obtained in class, via email, on the internet, or via any other media. ([Living our Unifying Values: The USC Student Handbook](#), page 13).

Support Systems:

[Counseling and Mental Health](#) - (213) 740-9355 – 24/7 on call

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

[988 Suicide and Crisis Lifeline](#) - 988 for both calls and text messages – 24/7 on call

The 988 Suicide and Crisis Lifeline (formerly known as the National Suicide Prevention Lifeline) provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week, across the United States. The Lifeline is comprised of a national network of over 200 local crisis centers, combining custom local care and resources with national standards and best practices. The new, shorter phone number makes it easier for people to remember and access mental health crisis services (though the previous 1 (800) 273-8255 number will continue to function indefinitely) and represents a continued commitment to those in crisis.

[Relationship and Sexual Violence Prevention Services \(RSVP\)](#) - (213) 740-9355(WELL) – 24/7 on call

Free and confidential therapy services, workshops, and training for situations related to gender- and power-based harm (including sexual assault, intimate partner violence, and stalking).

[Office for Equity, Equal Opportunity, and Title IX \(EEO-TIX\)](#) - (213) 740-5086

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

[Reporting Incidents of Bias or Harassment](#) - (213) 740-5086 or (213) 821-8298

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office for Equity, Equal Opportunity, and Title for appropriate investigation, supportive measures, and response.

[The Office of Student Accessibility Services \(OSAS\)](#) - (213) 740-0776

OSAS ensures equal access for students with disabilities through providing academic accommodations and auxiliary aids in accordance with federal laws and university policy.

[USC Campus Support and Intervention](#) - (213) 740-0411

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

[Diversity, Equity and Inclusion](#) - (213) 740-2101

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

[USC Emergency](#) - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call
Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

[USC Department of Public Safety](#) - UPC: (213) 740-6000, HSC: (323) 442-1200 – 24/7 on call
Non-emergency assistance or information.

[Office of the Ombuds](#) - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
A safe and confidential place to share your USC-related issues with a University Ombuds who will work with you to explore options or paths to manage your concern.

[Occupational Therapy Faculty Practice](#) - (323) 442-2850 or otfp@med.usc.edu
Confidential Lifestyle Redesign services for USC students to support health promoting habits and routines that enhance quality of life and academic performance.

PLEASE NOTE:

FOOD AND DRINKS (OTHER THAN WATER) ARE NOT PERMITTED IN ANY INSTRUCTIONAL SPACE IN THE SCHOOL OF CINEMATIC ARTS COMPLEX