Course Description:
Interdisciplinary class covers aspects of manipulating digital imagery and video for visual effects. Student teams of computer-science and film-studies majors will work together to learn and apply theoretical and practical issues. Topics include image and video representation, digital workflow, lighting, rendering, compositing film and CG plates, morphing, particle effects, dynamics, camera properties, match-moving, filters, and virtual cinematography. Film-studies majors concentrate on planning, storyboarding, and producing short movies that apply special effects, while computer-science students focus on programming and technical implementation issues of special effects.

Required Texts:

Optional:
Learning Maya: The Special Effects Handbook by Doug Walker.

Reference:
Think Python by Allen B. Downey
Special Effects: The History and Technique by Richard Rickitt.
Matchmoving: The Invisible Art of Camera Tracking by Tim Dobbert.
Complete Maya Programming by David Gould.
The Magic of Houdini by William M. Cunningham.
The Digital Matte Painting Handbook by David B. Mattingly.
Digital Image Warping by George Wolberg.
Cinefx (Journal for Visual Effects in Film).

Related Resources housed in the Randall Library:
The Art of Maya
MEL Fundamentals Courseware
Learning Maya: Rendering
Rendering 2D Effects in a 3D Environment
Understanding Maya Shading Networks
MELBot Wars: Virtual Fighting Robots
Polygon Texturing, Lighting, and Shading
Introduction to Animation Basics
Python Scripting in Maya
Mental Ray in Maya Workflow
Character Setup in Maya
Maya Studio Projects: Dynamics
Hyper-Realistic Modeling
Hyper-Realistic Facial Setup
Matte Painting 2
Digital Sets 1: Modeling & Camera
Digital Sets 3: Rendering & Compositing
Creative Essence: The Face
Maya Cloth Courseware
Learning Maya: Dynamics
Patch Modeling for Visual Effects
Particles for Visual Effects
Exploring Advanced Shading Networks
RigidBody Simulations for Visual Effects
Inside the Maya Architecture
UV Mapping Workflows
Artist’s Guide to MEL
Photorealistic Car Modeling
Facial Rigging in Maya Intermediate
Maya for Games: Modeling and Texturing Techniques
Hyper-Realistic Body Setup
Concept Art
Camera Projects in Maya
Digital Sets 2: Lighting & Texturing
Digital Sculpting Human Anatomy
and more...
Software:
Python, MEL, C++

Grading:
Project 1: Still compositing. 5%
Project 2: Match-moving and more advanced compositing. 15%
Project 3: Programmed effect of choice. 15%
Project 4: Final production. 20%
Homework including exercises, screenings, and papers. 20%
Quizzes based on readings and class material. 20%
Class participation, discussion, and presentations. 5%

Tentative Project Description Summaries*:
1. Still photo and CG elements are composited to create realistic, appealing compositions.
2. Using match-moving, image-based lighting, and advanced rendering; 3-D CG elements and video plates are composited to create two shots.
3. Project involves use of a chosen effect, implemented using Python (or MEL or C++) as a standalone element or as an addition to a software package such as Maya, Nuke, or Houdini. Example ideas include particle effects, fluid simulation, crowds, morphing, camera manipulation, etc.
4. Class completes short narrative film(s) that incorporate digital special effects crucial for the story. Films are scripted, story-boarded, produced, and edited with effects in mind. Effects will be completed from a variety of methods covered in the course. Proposals must be submitted and approved.

* CSC majors will focus more toward implementing digital image manipulation or 3D simulation using Python, MEL, or C++. FST majors will focus more toward applying production principles to plan, story-board, produce, photograph, model, animate, and edit as well as post-production techniques to complete effects-driven productions.

Class Policies
Quizzes will cover materials presented in class, whether lecture, video, tutorial, etc., as well as material from the required texts. Quizzes may include written questions or practicum.

3-D graphics work is very time-consuming. Plan carefully to complete projects in a timely manner. Late work will be reduced in grade by 5 points each day. There are no make-up quizzes. Please contact me in advance, if possible, if you must miss any graded work.

Attendance is required and will both directly and indirectly affect grades -- covered material is very pertinent to completing homework and projects effectively. Unless special circumstances are involved, more than three absences will result in class failure. Students are individually responsible for keeping current with course material and assignments.

Class announcements supersede posted material.

Academic honesty in all your work is required for a passing grade.

This syllabus may be subject to change with reasonable notice.