Course Description
An applied introduction to 3d character animation in video games; optimal iteration exporting to game engines, speed of controller feedback, custom scripting as well as character animation techniques of movement and visual communication specific to video games.

Catalogue Description
Gain a thorough applied foundation in the practice of 3D video game character animation. Understand the combination of both technical and creative processes unique to video games, esp. within a larger group project.

Learning Objectives and Outcomes
Students in ITP 351 will animate several provided rigged characters in the first half of the semester with the option to bring in their own in the latter. Visual communication and clarity from any camera view, scripts to optimize export and efficient character response from a controller are parts of the greater whole of how to animate within a game production pipeline. An engineering background helps, but it is not necessary as this class aims to break these processes down in a friendly and intuitive way.

The student will leave class knowing the process of how to animate any basic 3d character for games as well as optimize their workflow. Creativity and individualism is encouraged.

Prerequisite(s): Waived

Recommended Preparation: Experience with Maya
Course Notes
This course will assign a letter grade.
Students will submit work via Blackboard, and by showing builds to instructors and peers in class.

Technological Proficiency and Hardware/Software Required
The class uses the 3D software Maya 2019. Students are required to sign up for the three-year free trial.

Description and Assessment of Assignments
Course project: the purpose of the class project is to be able to provide a unique animation for any 3d rigged character. You need to identify the issues specific to any characters’ unique topology; sample models will be provided to students in the first half of class, and a unique model per student in the latter half. Working as a group is encouraged if the 3d models are similar enough in rigging need to justify this. A team can consist of no more than 4 persons.

Project Timeline:
- Week 2: In-class check of Maya and Unity installation and Google Drive access
- Week 6: Prototype Animation due (Exports to Engine or online build)
- Week 10: Mid-term Animation due (Custom character moves, controller response)
- Final: Final Character animation delivery

Sample rigs provide on Blackboard allow the student to learn using gradually more complex rigs about the goal of animating ‘readable’ moves within a game. Students are also provided with several custom scripts to optimize their experience, as well as emphasizing the importance of both organization and structure to allow project sharing across multiple stations. Ultimately the student will be given an assignment of a rig to be animated within a larger team project within USC Games. The animator will work on animating, exporting and examining the preliminary moves either in realtime or asynchronously for the team’s review and feedback.

Grading Breakdown

<table>
<thead>
<tr>
<th>Assignment</th>
<th>% of Grade</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly Homework (Checked in beginning of next class)</td>
<td>50</td>
<td>Ongoing</td>
</tr>
<tr>
<td>Midterm: Four Base Moves Online</td>
<td>15</td>
<td>Week 8</td>
</tr>
<tr>
<td>Final Online Animation Deliverable</td>
<td>20</td>
<td>Week 15</td>
</tr>
<tr>
<td>Participation</td>
<td>15</td>
<td>Ongoing</td>
</tr>
<tr>
<td>TOTAL</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Grading Scale (Example)
Course final grades will be determined using the following scale
A  95-100
A-  90-94
B+  87-89
B   83-86
B-  80-82
C+  77-79
C   73-76
C-  70-72
D+  67-69  
D    63-66  
D-   60-62  
F    59 and below  

Assignment Rubrics
Assignments and Homework are due at the beginning of class of the assigned week.

Missing an Assignment Deadline, Incompletes:
The only acceptable excuses for missing an assignment deadline or taking an incomplete in the course are personal illness or a family emergency. Students must inform the instructor before the assignment due date and present verifiable evidence in order for a deadline extension to be granted. Students who wish to take incompletes must also present documentation of the problem to the instructor or student assistant before final grades are due.

For assignments turned in after the assignment deadline without prior permission from the instructor, a penalty will be imposed equal to 10% of the total available points for the assignment, for each day or part of a day that the assignment is late, up to a maximum of seven days.

Attendance Policy:
Punctual attendance at all classes is mandatory. If possible, please contact the instructor before your absence from class, and afterward contact the TA or a classmate to catch up. Social media, including text messaging and internet messaging, are excluded from class unless explicitly permitted by the instructor.

Diversity
In making games and interactive media in a professional and ethical way, it is important that you consider diversity. When looking at your projects, you should consider who is depicted and how this work will impact others. What kinds of individuals and communities are represented in your work? What point of view does your work express? This class may assist you in learning how to make work that includes diverse viewpoints, and may discuss racial, religious, gender and sexual orientation issues in the context of games and interactive media.

Creating an Inclusive Space
In this class, we make a commitment to foster a welcoming and supportive environment where students of all identities and backgrounds can flourish. This means that you will be expected to offer content warnings when appropriate, use students’ stated pronouns, and respect self-identifications. While debate and discussion are welcome, please remain aware of the implications of your words and the images that you include in your work. If the instructor or another student points out something problematic, avoid being defensive; this is a valuable opportunity for us to grow and learn together. If you have a concern about any aspect of the class, you are welcome to speak with the instructor or the advisor for the division.

Additional Policies
This course emphasizes teamwork, and one of the desired learning outcomes is for students to develop communication and leadership skills. Students are expected to treat each other with respect, listen to each other, and work together towards a shared, collaborative, healthy work culture. Any student found to be disruptive or engaging in behavior that doesn’t meet the standards of respectful teamwork may be asked to leave by the instructor.

If you experience any problems with a fellow student regarding their work, please bring up your concerns with the instructor.
Course Schedule: A Weekly Breakdown
**Subject to change**
<table>
<thead>
<tr>
<th>Week 1</th>
<th>Topics</th>
<th>Lectures and Lab</th>
<th>Homework/ Deliverables</th>
</tr>
</thead>
</table>
| 8/23/21        | • Introduction to the Course and Goals. Intro to Graph Editor and Game Animations  
• Game vs Cinema character animations                                                                                                                                                                   | What is ‘Game Animation’ versus ‘Movie animation’.  
**Lecture:** Showing game animation in different genres, attention to motion loops, readability of moves from various angles. Iteration within an export pipeline is key; judge moves in-game.  
**Lab:** Experiment with needs for rig to use inverse and forward kinematics and when to use either. Set static keyframes to check deformations. | Homework:  
Animate provided base rig IK/FK pushup to get familiar with Maya Graph Editor and setting keyframes.                                                                                     |
|                |                                                                                                                                                                                                        |                                                                                                                                                                           |                                                                                                                                 |
| Week 2         | • Evolution of game animation using moving greyboxes  
• **Movelist** script                                                                                                                                                                                   | **Form 4 or 5 person teams for labwork.**  
**Lecture:** Using movies on image planes (or polygons) as guides for movement. Folder organization for sources. Begin studying movement keyframes, Hips and Chest first, key poses.  
**Lab:** Plug in a video run, idle and walk as guides in Maya. Use boxman rig to make core poses for each of the three moves. Offset movie animation in graph editor as move ‘guide’. | Delievable:  
Maya installed, Unity installed, Student webpage access  
Homework:  
Key poses for game animation using filmed reference. Make two main poses for walk and idle using reference guides                                                                 |
| 8/30/21        |                                                                                                                                                                                                        |                                                                                                                                                                           |                                                                                                                                 |
| Week 3         | • Exporting to console  
• **Straighten up** script                                                                                                                                                                             | **Exporting to Engine**  
**Lecture:** Labor Day, No Lecture  
**Lab:** Read in existing moves/poses from boxman rig, bake and export to online class console and have students run it in console. Can use Autodesk’s FBX Viewer if student is remote. | Homework:  
Make two unique poses for attack and death (No guides).  
Successfully export rig and see animation outside Maya in Game Engine or FBX Viewer.                                                                                             |
<table>
<thead>
<tr>
<th>Week 4</th>
<th>9/13/21</th>
</tr>
</thead>
</table>
| ● Version Control software  
● Timeline Shift script  

**SVN and Version Control**

**Lecture:**  
Animation projects using teams – version control and group animation pipelines.

**Lab:**  
Form teams for group projects. Record them in online team sheets. First team upload and download of animations using simple version control of Google Sync, Dropbox, OneDrive. Bake and check work in WebGL game console using simmer.io or some other development site: https://youtu.be/JZqTHjjtQHM

**Homework:**  
Each team records and chooses from list of game characters from AGP or custom character.

<table>
<thead>
<tr>
<th>Week 5</th>
<th>9/20/21</th>
</tr>
</thead>
</table>
| ● Readability from distance  
● Playbomb script  

**Lecture:**  
Core poses for chosen characters make custom filmed movie guides  
Folder structure for each team and character

**Lab:**  
Create a ‘Game Cam’ in Maya to check work – code to toggle it.

**Homework:**  
Greybox Prototype of character moves are ready in following week

<table>
<thead>
<tr>
<th>Week 6</th>
<th>9/27/21</th>
</tr>
</thead>
</table>
| ● References and group work  

**Lab:**  
Teams schedule out their progress on game animations with weekly progress and exports

**Deliverable:**  
Greybox Prototype poses published on WebGL, link on team page

<table>
<thead>
<tr>
<th>Week 7</th>
<th>10/4/21</th>
</tr>
</thead>
</table>
| ● Using shelves for custom scripts in Maya  
● Intro scripting MEL  

**Custom Scripts to help workflow**

**Lecture**  
Custom shelves, Coding in MEL or python. Resources and toolsets.

**Lab:**  
Make custom shelf of scripts provided for class, including setting project  
1. Movelister  
2. Straighten Up  
3. TimeLine Shift  
4. Playbomb

**Homework:**  
Schedule and pipeline construction for group project animations

<table>
<thead>
<tr>
<th>Week 8</th>
<th>10/11/21</th>
</tr>
</thead>
</table>
| ● Review of process, review of animation  

**Lab:**  
Prep for next week’s midterm

**Homework:**  
Group review of system, identify issues in pipeline with possible fixes

<table>
<thead>
<tr>
<th>Week 9</th>
<th>10/18/21</th>
</tr>
</thead>
</table>
| ● Tracking and Response  

**Lab:**  
Instructor review of each team’s pipeline and export systems.

**Homework:**  
Fixes to Identified issues in pipeline

---

*Syllabus for ITP 315 Rigging for Games Page 6*
<table>
<thead>
<tr>
<th>Week 10</th>
<th>MIDTERM PRESENTATION</th>
<th>MIDTERM PROTOTYPE</th>
<th>Deliverable</th>
</tr>
</thead>
<tbody>
<tr>
<td>10/25/21</td>
<td>Students present (in teams) their animated characters, showing the progress on each move. Afterward each team plays the other’s prototype, and fills in online Google feedback form with critique.</td>
<td>Live midterm presentation and playable link on WebGL. Playtesting Feedback on each Team’s game. Live breakout room sessions with instructor</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 11</th>
<th>11/1/21</th>
</tr>
</thead>
<tbody>
<tr>
<td>● UI and UX – clear communication with player is key</td>
<td>Lab: Students will receive feedback from classmates and AGP team detailing what was learned from the playtest, possible changes based on the feedback – and game animation clarity</td>
</tr>
<tr>
<td>Homework: Teams meet and discuss feedback and changes to game for final. Scheduled plan for changes/fixed/updates for final presentation</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 12</th>
<th>11/8/21</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Game Art and Animation</td>
<td>Lab: Teacher reviews each team and their feedback, identifying how to polish their animation and improve readability in game and speed of controller response</td>
</tr>
<tr>
<td>Homework: Polish final animations – focus on key points of impact</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 13</th>
<th>11/15/21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guest Lecture: Mike Dietz from ‘Neverhood’</td>
<td>Work on animations with midterm feedback. Stronger poses, filmed reference, and smooth transitions</td>
</tr>
<tr>
<td>Homework: Polish final animations – focus on smoothness in transitions and loops</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 14</th>
<th>11/22/21</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Polish animations</td>
<td>Instructor feedback on poses, smoothness of movement and clarity in game</td>
</tr>
<tr>
<td>Homework: Polish final animations</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Week 15</th>
<th>11/29/21</th>
</tr>
</thead>
<tbody>
<tr>
<td>Final Project Presentations</td>
<td>DUE: Final Presentation Final Publication Final Documentation</td>
</tr>
</tbody>
</table>

**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 Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

**Support Systems:**

*Counseling and Mental Health* - (213) 740-9355 – 24/7 on call studenthealth.usc.edu/counseling

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

*National Suicide Prevention Lifeline* - 1 (800) 273-8255 – 24/7 on call
suicidepreventionlifeline.org
Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call
studenthealth.usc.edu/sexual-assault
Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298
equity.usc.edu, titleix.usc.edu
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
usc-advocate.symplicity.com/care_report
Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

The Office of Disability Services and Programs - (213) 740-0776
dsp.usc.edu
Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Campus Support and Intervention - (213) 821-4710
campussupport.usc.edu
Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101
diversity.usc.edu
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
dps.usc.edu, emergency.usc.edu
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) 442-120 – 24/7 on call
dps.usc.edu
Non-emergency assistance or information.

Office of the Ombuds - (213) 821-9556 (UPC) / (323-442-0382 (HSC)
ombuds.usc.edu
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.