Student work examples

**Digital Still Life** **Course: 3D Modeling**

In this assignment students were asked to design a still life composition in the photo lab and reproduce it in CGI. The goal was to learn as much as possible about controlling physical lighting, and understand the behaviour of different real-world materials. After analyzing the outcome they selected the appropriate tools and techniques to mimic the results in 3D renderings. (The images show the reproduced digital renderings.)

The class instruction included: composition and design elements, camera, lenses, lighting, 3D modeling, texturing, 3D lighting and rendering.

Student work examples

Paper Town VR, ► Project link   **Course: Experimental Studio**
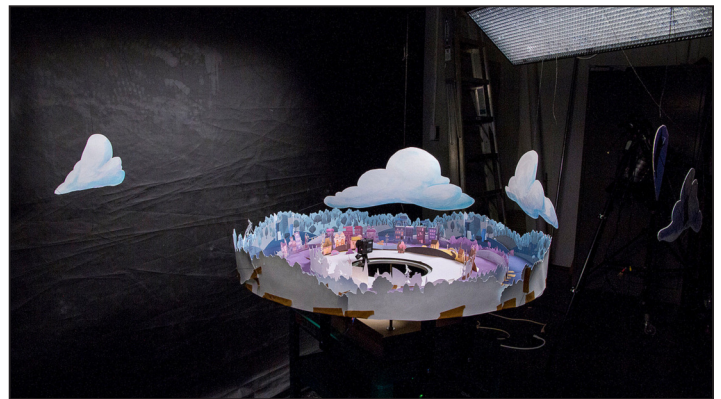
An art+design studio group project. Paper Town VR is an interactive art installation that immerses the user in a miniature 360° physical environment that can be experienced remotely through VR. The integral part of this project is a handcrafted artwork that adds a human touch to the experience. Utilizing a motorized camera as a scaled-down vantage point, the user can observe the scenery and goings-on of a tiny two-dimensional village as if it existed at a human scale.

Immersive Expressions exhibition, ACM SIGGRAPH 2017, Los Angeles (USA).

Student work examples

Visual effects, ► Video link   **Course: Advanced 3D Productions**

"Time to Fly" is a group project focusing on visual effects and integration of CGI elements with live action. The class instruction included compositing, green screen, camera tracking, 3D modeling and rigging.

3rd place at Hamburg Animation Award, Hamburg (Germany).

Experimental Animation, ► Video link   **Course: Advanced 3D Productions**


This is a group project focusing on experimental techniques for digital animation.
The class instruction included story and character development, 3D modeling and rigging, animation, look research and development. Making of presentation ► **Video link**.

Selected for Panorama screening at the Melbourne International Animation Festival (Australia).
Bronze in Film, Film Craft: Animation category at the Crowbars Award, Singapore.

Individual Animation Projects   **Course: 3D Animation**
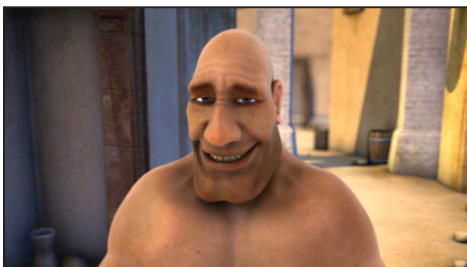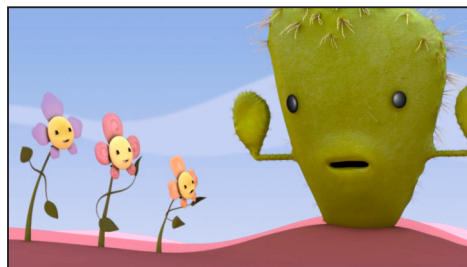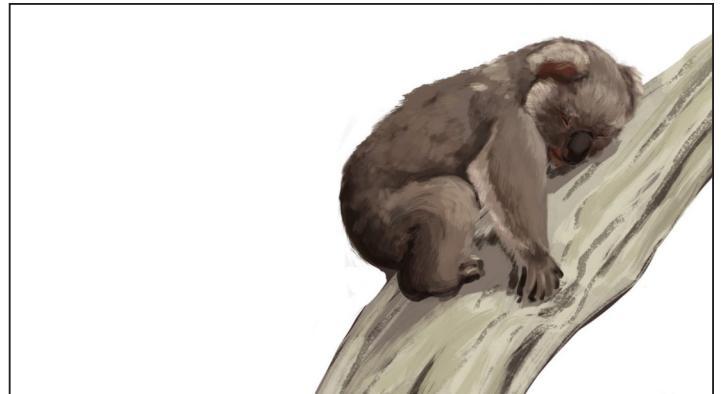

► **Video link**   ► **Video link**   ► **Video link**

Examples of animated short films produced by individual students in my studios. The main focus was on story and character design. The production time is about 14 weeks.

Student work examples

**Scavenger hunt App with Beacons, ▶ Project link**   **Course: Interactive Studio**

The augmented-reality scavenger hunt takes users on a journey through the Imagination Corridor located on NC State's campus to discover exciting Australian animals. Working with the College of Sciences, Department of Biology, a group of students were tasked to design, develop and publish an app that is triggered by beacon technology hidden at various locations on campus. The educational app contains information about animals in form of illustrations, videos, and recorded audio commentary. The assignment included user interface design, gamification, illustration, video and audio editing, and programing.

The Giant Moa, ▶ Video link   **Course: Advanced 3D Productions**
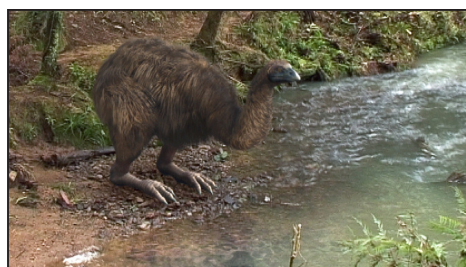
The Giant Moa was a collaboration with the Auckland Museum and the short film blends CGI animation with live footage charting the animated Moa's hypothetical journey from the bush into the contemporary world, ending up in the Natural History section of the museum - face-to-face with the Museum's iconic Moa model. The project has received highly acclaimed reviews from extinction biologists.
Making of presentation ▶ **Video link**.

Student work examples

DITI - Digital Therapy Interface, ▶ Video link   **Course: Interactive Studio**

An interactive glove meant to gamify physical therapy - in this case, learning simple piano songs while doing a physical therapy hand exercise meant to restore mobility to the fingers. Patients, when told to do certain exercises at home, often forget to do so or find the exercises tedious. The purpose of the project was to make physical therapy more fun and engaging for patients to do on their own time, addressing the problem of patient compliance. The project was completed by 5 students in a studio course focusing on design and development of interactive interfaces.

Interactive Puppet Theatre, ▶ Video link   **Course: Interactive Art Studio**

An individual final project using fabricated elements and physical computing to tell a story. The show challenges young children to follow the character's journey around the world and feed the native animals as they appear. The idea behind the project was to replace the familiar digital screen with a physical stage while giving the interactive control meaning in the story.

ArtScience Museum, Singapore 2013.

Student work examples

Caption, ▶ Project link   **Course: Interactive Art Studio**


Caption is an interactive art installation that encourages people to rediscover the value of tangible connections through art and technology. It uses projected images and motion capture with Kinect. The users are encouraged to interact with one another through the installation. Then images are printed as a prompt to make that connection real. The project was produced by a group of three students.

Singapore Night Festival at Singapore Art Museum, 2013.

Physical Interface for Real-Time Data, ▶ Video link   **Course: Interactive Studio**
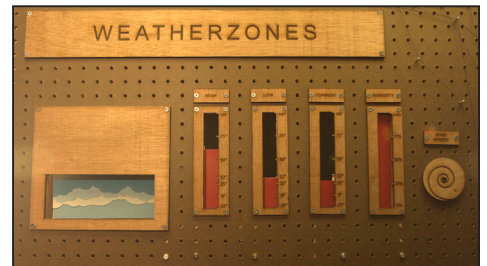
Through many iterations with analog sensors, fabrication and programming, a group of students have designed a robust physical interface through which users can both select and view real time weather information for cities around the world. Weather Zones consists of three parts: the analog user interface, the digital backend, and the mechanical display. The user can slide to select between five world destinations. As soon as the slider arrives at a specific destination, the backend code loads the real-time weather data associated with the destination, and sends this information to servo motors on the mechanical display. Aesthetically, this information manifests as an environmental change of the illustrative elements on the display using an exposed pulley system to physically deliver the data and indicate the type of real-time weather present at the selected destination. As the user moves the slider to other destinations, the mechanical display will adjust its environment to reflect the pertinent information in real time.

Student work examples

Gamification, ▶ Project link   **Course: Introduction to Game Creation Studio**


Students were tasked to gamify sustainability education and design games that teach sustainability to different age groups. They developed original board games paired with a digital app component to enable the dynamic input of information and this way make the game more interesting each time is played. In order to complete this project the students had to research the internal conflict areas between economy, environment and equity, and come up with a meaningful narrative for the games.

International Conference on Education and New Learning Technologies, Barcelona (Spain), 2017.
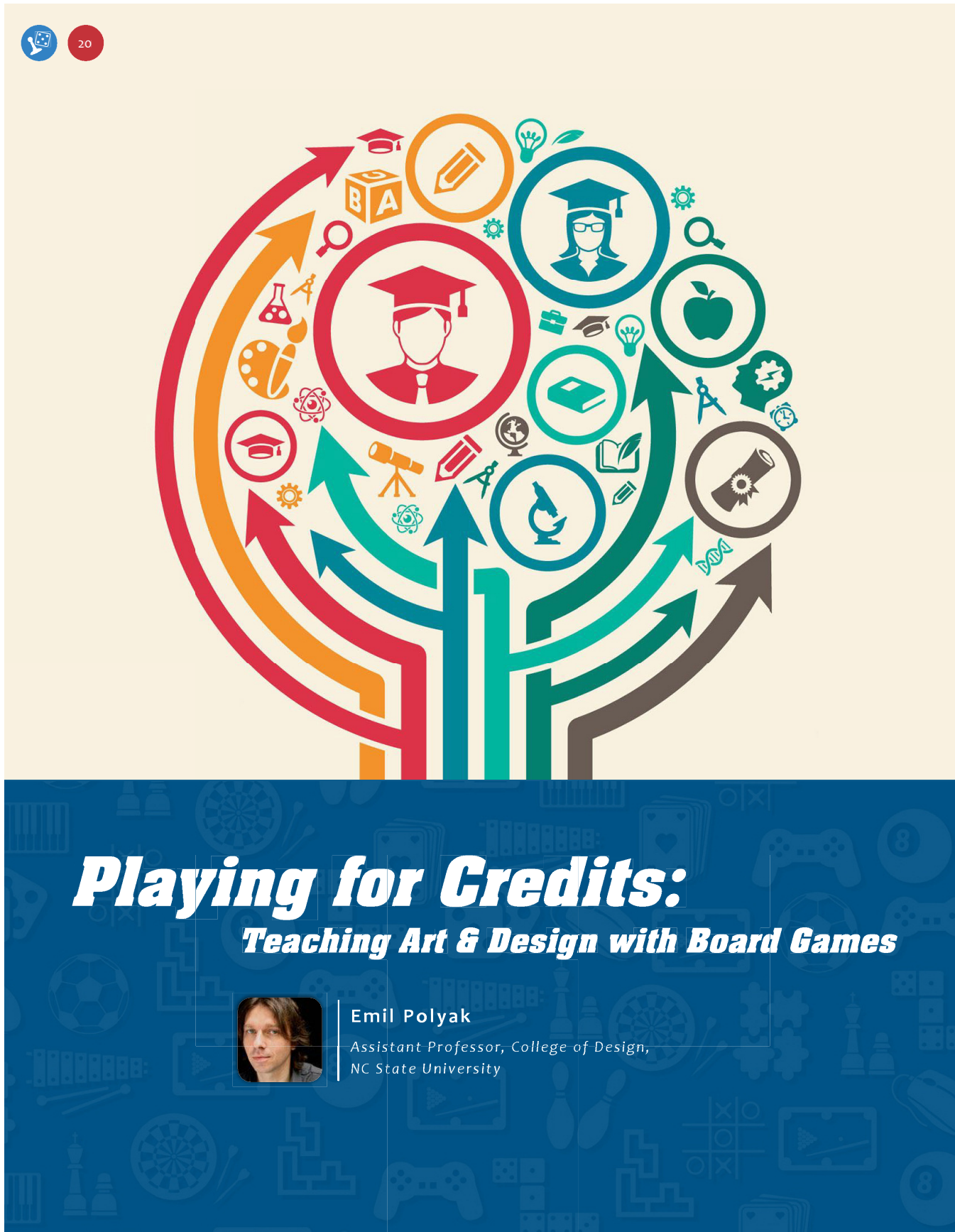
Game Design and Development   **Course: Introduction to Game Creation Studio**
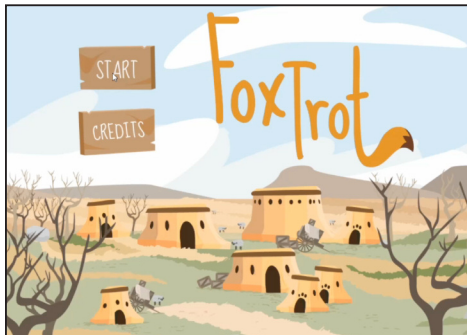
FoxTrot follows a fox named Todd, who must journey across the land, solving puzzles and interacting with a diverse cast of animal groups as they all struggle to find out who or what is the cause of the drought devastating the land. This game was inspired by research into the ongoing drought in California. The drought, which began in 2011, has been inciting division among different interest groups who all lay the blame with other rival groups. This concept was the basis of the conflicts found between the animal clans portrayed.

Board Games, the following article is from the magazine "Casual Games Insider"

Playing for Credits:
Teaching Art & Design with Board Games

Emil Polyak
Assistant Professor, College of Design,
NC State University

A s an educator for more than a decade, one of the most challenging and rewarding parts of my tenure has been designing projects that are not only enjoyable to work on, but that also create a dynamic link back to teaching the organic design process. Making games requires the synthesis of a number of skills, from the development of the visual and haptic aesthetics to the storytelling and user experience. Our department of Art+Design at NC State's College of Design fosters active learning through collaborative effort. The "Introduction to Game Creation" course teaches the creative process by immersing students in game theory and design.

During the first session of this new game design course with the students, I realized that playing board games in class not only motivated creative and logical thinking, but also activated "sacred areas" full of joy, as Johan Huizinga proposed in his theory of play back in 1938. Using this momentum, I assigned copies of games from my own collection to groups of students without telling them what they were or how to play them. These games included the *Royal Game of Ur*, *Senet*, and even *Tablut*. (Fortunately, no one was familiar with any of these centuries-old games.)

I asked the students to "decrypt" the games by defining their own rules and mechanics, as well as to test those. This turned out to be a very challenging task and triggered some very unique and fresh ideas.

Interestingly, what everyone was immediately captivated by was the attention to detail and the feel of natural materials on wooden boards, which clearly showed up later in their own projects.

In another exercise, groups were tasked to create games that could be played practically anywhere without any components. We based this on Roger Caillois' book "Man, Play and Games" in which he categorizes play to "Ludus and Paidia"—rule-based and spontaneous activities. This concept was broken down further to chance, competition, role play, and vertigo. The exercise used a top-down method, as the students reverse-engineered the activity to isolate individual game elements.

Textbook Definition

At the beginning of the course, students were given "A History of Board-games Other Than Chess" by Harold Murray. This resource dives into the academic research of board games: the etymology and history, design elements, and concepts covering both traditional and abstract games. In his work, Murray classifies board games based on their core objectives: alignment and configuration, race, hunt, war, and mancala. These classifications, paired with a formulated list of possible movements and captures, creates a fascinating look at board game concepts, especially in light of recent studies by scholars such as David Parlett.

From the art and design students' perspective, Parlett's juxtaposition of "themes to mechanics" and "mechanics to themes" opens up new questions. What sort of design process should really be used? What is the most effective way to work as a team while building and envisioning an experience that is very different from storyboarding and filmmaking?

One of the main objectives during this course was to encourage an innovative, game-related design process. Students were taught to use critical thinking, research and analysis, and a collaborative environment to foster originality instead of simply memorizing

step-by-step blueprints or technical templates. Students then explored storytelling in the context of game design—plot elements such as exposition, climax, and resolution suddenly had the possibility for alternative outcomes. It's no surprise then that their final project was to design a game.

Student work examples
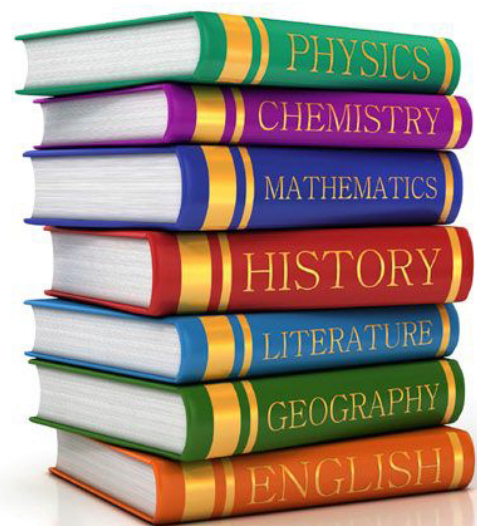
The Final Project

The brief of the project included the development, design, and fabrication of a board game as well as the documentation of the design process that the groups decided to follow. Beyond these requirements, complete freedom was given in terms of what type of game is developed or what materials and tools were employed. The students worked in seven groups and approached the task in very different ways.

Stack
by Lucia Barrett, Troy Calkins, Allison Goodman

One group took the challenge to design an abstract game by focusing on unique physical components carved out of wood. These components include several concave as well as convex pieces, some with holes and tricky curves that make their structural stability difficult to predict. In addition, the designers planted extra weight into some of the pieces that is visually impossible to detect. They called the players "the Architect" and "the Destroyer." The Architect must build a wall that is not only self-supporting, but can also withstand the impact of a steel ball rolled against the wall by the Destroyer.

Satellite Nation
by Stephanie Lee Huang, James Park, Anahid Telfeyan
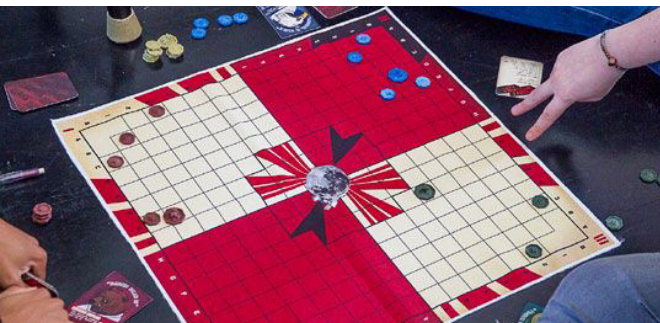
In contrast, this group designed a Cold-War-inspired, futuristic moon colonizing game called *Satellite Nation*. While players must move on a specific orbit on the board, their actions mimic opposing political powers trying to overtake the Moon. The game integrates terms such as embargo, double agent, nebula, and black hole for the game mechanics to capture the theme.

Firewall
by Austin Caskie, Kirk Denny, Jack Wingo

In *Firewall*, players are rival hackers tasked with breaching the firewall installed between them. They must build "code segments" across their domain in order to traverse up and over the firewall. In addition, "virus tiles" can be used to infect the opponents' territory, which will temporarily paralyze them.

Eventide
by Prince Arrington, Faith Furlough, Caswell Turner

Toads and fireflies, day-night transition mechanic, and a re-configurable board are the main elements of the *Eventide* war game. For the fireflies to win, King Ampinga must be found and killed before all of the fireflies are killed. For the toads to win, they must kill all of the fireflies. When they are bathed under the sun, toads are able to use their sticky tongues to slurp up enemy fireflies, and the fireflies are able to revive fallen comrades. The board was made of wood with an elevated feel and a color palette that reflects the story.

Student work examples

Yokai
by Lucas Gargano, Kierston Morrison

Yokai is inspired by the traditional Japanese mythology of demons. The creators paid tribute to the culture by using calligraphy, watercolor, and a bento box packaging with a traditional furoshiki wrapping. The captivating story takes place deep in the heart of Japan in the little village of Kangata, founded upon land once ruled by righteous forces long ago. Kangata has been sought by many, no more so than the benevolent creatures called Yokai. The Great Northern Shrine has been destroyed, and there is no balance or protection against creatures that seek ill harm towards Kangata. The town is besieged by spirits that have long sought the land for themselves. The four lost pieces of the shrine hidden by the Yokai must be found in order to restore balance.

Something Spooky
by Erin Gebbia, William Underwood

Something Spooky is a race game with the objective to escape a haunted house built a long time ago by a mad vampire scientist on an ancient graveyard. A deck of spook cards make the escape difficult and surprise trapdoors complicate the path. The designers have created a fantastic series of comic book style artwork for the cards.

Mortality
by Sarah Anderson, Trevor Davis, Michael Perlmutter

In *Mortality*, 2-6 players are scientific test subjects tasked with collecting as many diseases as possible before making it back to the lab for study. Each player has a health tracker, and in the case they die, a research team will clone a new version of them to start a new trial. There are numerous cards that can heal players and cure diseases hidden within the game. If the player draws an infection card, they will first take the effects of the disease as usual. They must then place an infection token on their current space, and place the infection card nearby. Any other players that land on that space in the future will suffer the effects of the infection. The game is very intuitive and the dark humor makes it fun to play. Ironically, the game was inspired by *The Game of Life* with a twist of using the most unpleasant aspects of life: sickness, injuries, and death.

Student work examples

In our College of Design, the focus is equally on the design process and physical production, regardless of the course subject or level being taught. The number of groups and variety of projects developed during the Introduction of Game Design course turned the class into a design powerhouse. While one group was working on the visual appeal and a consistent color palette, another group was analyzing their statistical test data to improve gameplay. Collaboration is an extremely common practice in the field of design, and the process of developing a physical game that is playable by others can teach far more than just technical design skills. Overall the course was a great success, and the project enabled us to establish a solid foundation to build off of in the next phase: working together on video games with characters and story development.