**Unit 1 History and Ethics of Games:**

 Non Electronic Games are classified as Board and Card Game

1. Card Games
	1. The Earliest history of cards is believed to have started in Central Asia
	2. There are many types of Card games such as:
		1. Matching: Goal is to collect your opponents cards
		2. Adding Games = players play in turns, adding the value of the cards together as they are played. The goal is to reach or avoid certain point totals.
		3. •Fishing Games = each player is given a hand of cards with a layout of face up cards on the table. Players play one card in turn. If the card played matches the layout card, the layout card is captured and placed in front of the player. If a card does not match, it becomes part of the layout.
		4. • Card Exchange Games = Players have a hand of cards and exchanging a card or cards with other players. The exchange may also be with a stack of face-up or facedown cards. The object is usually to collect certain cards of set of cards.
		5. • Draw and Discard Games = Player have a hand of cards and two stacks on the table. The game involves picking up an unknown card from the stockpile or a known card from the discard pile. The player must then discard a card face-up on the discard pile. Players are trying to improve their position to some end goal.
2. Board Games- The goal of a board game is to have an ending it is the necessary action to win the game.
	1. An example of a board game in which the game sets aside a player to complete certain actions is a called a turn.
	2. The First board games believed was the Royal Game of Ur. The Royal Game of Ur was created in Mesopotamia (modern day Iraq) which dates back to 2500BC.
	3. Many Games were the precursor to modern day common games such as:
		1. The Landlord’s Game – Monopoly
		2. The Royal Game of Ur- Sorry and Trouple
		3. Go- Othello
	4. There are many different player types of board games such as:
		1. Player Vs. Player Ex: Checkers, Chess, Tic-Tac-Toe
		2. Multiple Players Ex: Monopoly, Sorry, Mousetrap
		3. Team: Euchre, Spades

Electronic Games:

 Early History:

1. 1958: William Higginbotham, the head of Brookhaven National Laboratories, created a game like tennis to entertain visitors.
2. During the 1970’s Military bases adopted Arcade games, SEGA (Service Games) These games had to be simple and fun to play due to the limited power and memory.
3. In the Mid 1970’s The Game industry had a major advancement with cartages that led to Console games.
4. In 1976 Atari came out with the first commercially sold console gaming system called Atari 2600
5. In 1985 Gaming systems struggled with unexciting video game selection however Nintendo Super Mario was a hit due to a storyline of a beloved character Mario.
6. In 1995 Nintendo released the first hand held video game system in Game Boy.

Modern day Electronic Games: Knowing how gaming consoles have advanced throughout history pc game sales have declined due to the advances in game consoles.

1. The way the player interacts with the game has evolved from a Joystick-) Controller-) Touch Screen-) Motion Controlled.
2. The Computer has been the biggest Technological Advancement in Gaming
3. Faster and more efficient game engines has a made a major impact on making the games appear more realistic.
4. Future game developers are making games virtually interactive by using Kinect and Wii Systems. A player’s health will benefit from being more active.
5. New features on portable devices such as game transferability

Ethics: Ethics is applying a moral judgment of right and wrong, moral and immoral to something. Ethical Behavior is doing what is right all of the time.

1. Game Developers and Designers have to make ethical considerations when creating all interactions in the design.
2. Video Games are protected under the First Amendment of the United States Constitution labeled under Freedom of Speech.
3. ESRB Ratings: The Entertainment Software Rating Board (ESRB) was developed following hearings held by two US Senators in 1993, which were intended to address concerns over violence present in computer/video games. These ratings help parent’s excursive ethical decisions in what games they allow their children to play.
4.  EC- Early Childhood content suitable for age 3 and older
5.  E- Everyone- content suitable for age 6 or older. E10+ Everyone 10 years old and up. Titles in this category may contain minimal cartoon, fantasy or mild violence and/or infrequent use of mild language.
6.  T- Teen is rated for ages 13 and older. Titles in this category may contain violence, suggestive themes, crude humor, minimal blood, simulated gambling, and/or infrequent use of strong language.
7.  M- Mature rated for ages 17 and older. Titles in this category may contain intense violence, blood and gore, sexual content and/or strong language.
8.  AO- Adults Only rated for ages 18 and older. May include prolonged scenes of intense violence, graphic sexual content and/or gambling with real currency.

Trends in Gaming:

1. Game Virtue is what determines if a game is good or bad
2. The new gaming trend is based on connecting organizations through the Web or online play.
3. Game designs are started by generating new ideals with brainstorms.
4. Politics can play a major factor in developing scientific research to help develop the latest game technologies
5. The Development of many games is based upon the humans need for protection
6. Games are develop for the player to feel comfortable to the gaming experience

**Unit 2 Job Readiness in Game Design:**

1. A Cover Letter is needed to show the potential employer skills that match the desired ones necessary for the job.
2. Management is the process of planning, organizing, and controlling work.
3. A gaming company must Brainstorm an ideal (planning), Produce the game (Design), (develop) Create the actual product) Test the game, licensed or copyright protected, and finally Marketing and sell the game.
4. The best solution if there was a debate on a title for a game is to take a survey and ask other peoples thoughts.
5. Benefits of working with a team include ability to split up work, Team discussions, collaboration with opinions.

Careers in Game Art and Design

1. Designing computer gemesis is a highly technical job where in the designer are responsible for designing, coding, programming and testing the games.
2. Animator must have knowledge of character modeling, kinematics (knowledge of human and animal movement), texturing, anatomy and rigging.
3. Designer is responsible for conceiving and designing the rules and structure for the game and to entertain the players. A game designer must be able to speak, write, and have art and logic skills. A designer must have good people skills and be a team player.
4. Producer manages the development team, schedules, reports, hires, and does quality control.

Quality Control- Product is high enough quality to be sold. The company ensures their product is of high standards to be sold.

1. The Lead Artist or art director supervises the concept artist, environment modelers, character modelers, animation and texture artist
2. The Game Design team consists of: Game designer, scriptwriter, artist/animator, programmer, and the producer
3. The Game Writer is responsible for the storyline.
4. Audio Production has three categories sound effects, music, and voice-over
5. Game Tester- is responsible for analyzing the game for defects, glitches and bugs during the design process.

**Unit 3 Game Design Culture and Play:**

Social Game Interaction: Many games are played with more than one player.

1. Online Multiplayer- Players connect home PCs to the Internet.
2. MMOGs, MMORPGs , MMORTSs and MMOFPs-
	1. MMOG - massively multiplayer online games.
	2. MMORPG - massively multiplayer online role-playing games. Can be addicted.
	3. MMOFPS - massively multiplayer online first-person shooter games.
	4. MMORTS - massively multiplayer online real-time strategy games.

Player Patterns- Most games have uniform roles for all players while some have more than one role for players. There are 7 major roles players can play.

* 1. Role Playing Games (RPG)-have a variety of roles for players to choose.
1. Single Player Vs. Game-
	1. Most common pattern for digital gaming (use cards to demonstrate).
	2. Includes puzzles and other game structures to create conflict (solitaire).
	3. Individual decision problems with slocastic outcomes
2. Multiple Individual Players vs. Game
	1. Multiple players compete against the game in the company of each other.
	2. Action is not directed at each other.
3. Player Vs. Player-
	1. A game where two players directly compete.
	2. Classic structure for strategy games and good for competitive players.
	3. One-on-one makes competition a personal contest.
4. Unilateral Competition-
	1. Two or more players compete against one player.
	2. Examples include tag and dodge ball.
	3. Interesting model for combining cooperative and competitive game play.
5. Multilateral Competition-
	1. Game structure in which three or more players directly compete.
	2. This pattern is what people think of when they think of multiplayer games.
6. Cooperative Play-
	1. Two or more players cooperate against the game system (Farmville).
	2. Often found in children’s board games.
7. Team Competition-
	1. Game structure in which two or more groups compete.
	2. Includes soccer, basketball and charades.
	3. This game structure can provide fun for fans of the teams as well as the players (Spades).

Game Objectives or challenges- A game objective is what a player is trying to achieve in order to win. The task players are trying to accomplish within the game.

 A.)Game Objective Categories- Time, dexterity, endurance.

1.) Capture- Take or capture something of the opponent’s while avoiding being captured or killed.

2.) Chase- Catch or elude an opponent. Chase games can be structured as single-player vs. game, player vs. player, or unilateral competition.

3.) Race- Reach a goal – physical or conceptual – before the other players.

4.) Alignment- Arrange game pieces in a certain configuration or create conceptual alignment between categories of pieces.

5.) Rescue- The objective is a rescue or escape game is to get a defined unit or units to safety.

6.) Forbidden Act- The objective in a forbidden act game is to get the competition to “break the rules” by laughing, talking, letting go, making wrong moves, or doing something they shouldn’t.

7.) Construction- The object in a construction game is to build, maintain, or manage objects.

8.) Exploration- The object in an exploration game is to explore game areas – usually combined with a competitive objective.

9.) Solution- The object in a solution game is to solve a problem or puzzle before the competition.

10.) Outwit- The object in a game of wits is to gain and use knowledge in a way that defeats the other players.

Game Rules- Affect the outcome of the game. Allows Players to decide basic task such as who goes first in the game. Players must know all rules in the game and enforce the rules. To many rules makes games unplayable.

Probability- is a branch of mathematics that deals with calculating the likelihood an event will occur and is usually expressed as a number between 1 and 0.

Game Resources- Game resources play much the same role as resources play in real life. Designers must plan how players find or earn resources needed to stay alive and healthy and ultimately win the game.

 Typical Game Resources are: Lives, Units, Health, Currency, Actions, Objects, Terrain, and Time

Game Theory-

 Fun in Games- Games must have an entertaining value in order for players to gain a satisfaction on playing the game. An example of this is collecting something for points, and ultimately winning the game.

 Players use a variety of interactions with their sense of sight, sound, and touch.

* 1. Physical interaction- Dancing and movement, many games also make good use of hand-eye coordination, Players control joysticks and coordinate keystrokes to achieve a desired result.
	2. Social interaction- Storytelling taps into the human desire for social interaction. Players can experience social interaction with two-player and multi-player games.
		1. With advances in Xbox Live the first verbal interaction through the gaming system, players have more interacting with others.
		2. The World Wide Web has allowed players from across to glove to connect and game together
	3. Mental- Improving our mental skills and intelligence can be fun. These games are based on the ability to perceive and use patterns

# Game Genres - The gaming and entertainment industry are divided into categories by media and genres. Genres involve categories describing generalities of style, and content. Genre is the most important fundamental game design element a developer needs to explore.

1. Action- Characterized by a fast paced plot, quick responses, and motor coordination. Includes diverse subgenres such as fighting games, shooter games, and platform games.
2. Action Fighting- Emphasize one-to-one combat between two characters, one controlled by a player. Games can be linked together. Many of the movements of the character are usually physically impossible.
3. Action First Person Shooter- Emphasize shooting and combat from the perspective of the player/character. The player can aim and feel part of the environment. A view that shows the scene as if the player had a camera attached at eye level is called first person.
4. Action Platform- Character usually travels between platforms by jumping, climbing ladders, running, and leaping. Most successful were 2D although some 3D game exist.
5. Action Adventure- Combine action and adventure genres. Usually with long term obstacles with many smaller ones along the way. Focus on exploration along with gathering, puzzle solving, and combat.
6. Adventure- Puzzle related and involve story driven exploration. One of the earliest games created. Very little pressure in the form of action and time constraints.
7. Casual- Wide variety of games that appeal to a very large audience with very short play sessions.

Usually have a gradual learning curve, a scoring system, no or little story, linear progression, and well-defined levels.

1. Educational- Used to teach real-world skills through game play. Most games target younger players up to the mid teens. Growing field with many new entries each year.
2. Role Playing- Most cast the player in a role within an adventure where specialize skills are needed in a predetermined storyline. Many maneuver the player through an over world containing monsters where access to other worlds can be obtained.
3. Simulations- Closely simulate aspects of real or fictional reality. Players build, expand, or manage virtual communities or project with a limited supply of resources. Subcategories include construction, life, vehicle, and other operable machines.
4. Sports- Emulate the playing of traditional sports such as football, basketball, racing, NASCAR, and soccer.

Some rely on the gameplay of the sport while others concentrate on the strategy behind the game.

Strategy- Gameplay requiring careful and skillful thinking and planning in order to win. The player has a God-like view of the game controlling all of the elements. Moving from turn-based to real-time systems.

1. Memory or Knowledge- When a game requires knowing the answers example jeopardy.
2. Arcade Games- Very little mechanic Variation.

**Unit 4 Game Prototype:**

Design Process- When a game is in a planning, sketching and laying out the game design ideals plans are always based on the designer.

* + - 1. Generating Ideals
			2. Exploring possibilities
			3. Selecting an approach
			4. Developing a Design Proposal

Game Conception- steps in creating a video game. Coming up with a new idea and expressing it orally , written or a visual format is Conceptualization.

1. Brainstorming- Can help achieve the first step in a game design process by generating ideas.

 A.) Individual brainstorming: involves writing down every idea without evaluating. Then consider each on its own merit. Brainstorming is a problem-solving without criticism.

* + 1. Group brainstorming:Members of the group offer ideas. No one criticizes ideas until the brainstorming process is complete. The goal is to generate as many ideas as possible.
		2. Mapping:There are several versions of mapping such as clustering, webbing, branching and all are forms of brainstorming.
1. Sketching- Planning is the most vital part of a game design most designers will be gain with sketching. A sketch is a rough drawing of an idea or model. Sketches are done freehand and are not intended to be finished work.
2. Storyboarding- A series of connected pictures, with or without words, that tells the story or flow of events in a game or video. Graphic organizer or map to develop and materialize media such as games. Can be altered if you wanted to add a feature to a character. Relays plans and ideas to colleagues.
3. Game Ideas- Coming up with an idea for a game can be overwhelming. Ask your teacher for guidelines. Remember your game must be somewhat educational. Look online for ideas. Be creative. Use your brainstorming techniques.

Define the Problem- Receive a problem to solve for the client

Brainstorm-Present ideals in an open forum to generate ideals

Research and Generate Ideals- Conduct research for those Affected by the problem starts the invention process

Identify Criteria and Constraints- Identify what the solution should do.

Explore Possibilities- Consider further ideals from brainstorm and constraints

Select and approach- Review brainstormed information and answer any reaming questions

Design Proposal- Explore the ideal in greater details with sketches

Model of Prototype- Make a single model to help communicate ideal

Test and evaluate- Test the prototype in a controlled environment

Refine- Make design changes, modify or rebuild prototype

Create or make- Determine mass production

Communicate results- by creating a visual of your concept

Design Process- A process that provides ways to turn resources into products and services. The Design process is used to develop and produce a product or system in any industry. The design process is a systematic, interactive approach to problem-solving that yields design solutions. 

 Prototype Production- Designing a product an engineer will fabricate a working model or prototype

Pre-Production- Game designers plan out all the ideas and elements they need to produce a game. Designers create documents to help the team keep similar visions of the game. They also help the team sell the idea to the producers. The game design document (GDD) is one of those documents. This is when the designer decides on a theme for the game.

The Game Design Document- Tells the design team everything they need to know to create a game. A GDD is created by edited by the developer team and it is primarily used in the video game industry to organize efforts within a developer team. A Game design document should include the following major sections: introduction, concept, and design, technical. \*Due Dates are not in a Design Document.

* + - 1. Cover Page- Include the working title, Art that is related to the game, Your Name (team name)
			2. 2. Table of Contents, List of everything in GDD, Use page Numbers
			3. Working title and genre -Include the working title and a brief explanation of why you selected the title. Remember in the real world you will have to deal with copyright issues. Your game title must be unique. Include the genre category you think your game fits into and explain the selection. Core Statement is created directly from genres.-
			4. Target Audience Game- age rating - think who you are trying to engage - children, teenagers, adults, or a general audience. This will determine many aspects of your game, such as difficulty, complexity, and visual style since each audience has its own preferences. List any special skills your game might help to teach, e.g., math skills.
			5. Story and characters: Idea briefly explain the idea of your game and any back-story. Explain the characters and where you got the idea. What is the visual style -how you want it to look and play.
			6. Art: all sketches and storyboards-Place the sketches and storyboard from Lesson 1 here with any other sketches. Include print screens of the board and cards when you complete the game.
			7. Gameplay: How the game is played including the rules document Explain in detail how to play the game. Write a rules document.
			8. Cover Letter to Producers Write a letter to a prospective, producer introducing yourself, your team, and your game idea. Four solid paragraphs

Post Production - The most complex area of your game design should occur at the end. Testing, rigorously playing the game and finding bugs and quirks are all done during the Post Production.

* + - 1. TEST AND RETEST - for more thorough testing to find all of the bugs and quirks in the game and gameplay. Is the phase of game design that helps the developers identify potential flaws?
			2. Quality Control- Product is high enough quality to be sold. The company ensures their product is of high standards to be sold. Quality control ensures a product is within specifications. Is the process called to ensure consistency when mass producing a game.
			3. Marketing the of the game. Maintenance - special edition, replace game pieces, replace rules, send out corrected rules.
			4. Game Proposal- A document that gives game overview, game treatment, competitive analysis, budget, and schedule.
			5. It is Important to consider alternative solutions when developing a design.
			6. Core Statement- What is your game about?
			7. Industrial Design- Section of the game concept and design document includes the entry behavior assessment, items and audience analysis

**Unit 5 3D Modeling:** The process of developing 3D (height x width x depth) assets using a 3D software package.

One of the visually stimulating components of electronic gaming is 3D technology. In order to create 3d Objects we have to polygon Model, Add a material, add mapping, create a terrain and render the final product. When Creating 3d objects it is important to have a reference image of the object you are creating.

Polygon modeling- Is the method of choice for “real time cpu graphics” because of the simplicity of the 3d models. 3D objects are created by producing a collection of points called vertices.

 1.) Standard Primitives are use to create geometric shapes a building blocks for complex models.

 2.) Lathe- A modeling technique to create bowls, bottles and dishes.

 3.) Solid Modeling- is when you have volume of a 3d Object (like a brick)

 4.) Shell- is a group of continuous faces in a polygon mesh.

 5.) Transformation- Are changing size by using scaling, rotating object, mirror object

 6.) A Triangle- has three vertices connected to each other by three edges

 7.) An Edge- A line connected by 2 Vertices.

 8.) Mesh- A unit of a polygon model selected in the object mode. Connected polygons form an outline of a 3d Object.

 9.) Photogrammetry- is a tool used to build a 3D wire mesh of an object.

 10.) Union- is combining objects together into one new object.

 11.) Cloning- is the copying of an object to create the exact object.

 12.) Extrusion- is the process of creating a 2d object into 3d. Elevate or lower a selected 2D surface.

 13.) Boolean Operation- are used to combine or subject an object from another

Material and Mapping and Textures- There are 3 different texturing methods: bump, opacity, and displacement. Adding Texture to 3D models would produce efficient use of technologies.

 1.) Opacity Mapping- Controls a material transparency. Opacity map uses black and white images to hide certain parts of an image.

 2.) Disadvantages of a 3D map is the possibility of invasion of privacy

 3.)UVW Mapping- Is the process of applying a 2D image onto a 3D object

 4.) Bump Mapping- is used to create the illusion of raised or depressed areas on an object. Texture of an orange

 5.) Specular- determines the color of a material’s highlight.

 6.) Materials available for your project is a great example of resources.

 7.) Diffuse maps are use to select colors for a material, which determines the color of a material under normal lighting.

Terrains- Mapmakers use satellite-generated height maps to create 3D maps of Terrains. Typically these maps are black and white and they have 254 shades of gray in between. When creating a Terrain game designers face a balance of realism and a smooth running game.

Rendering- is the process of producing a 2D image on a 3D object. Reflective surfaces like glass or metal require extra processing of power and Time.

**Unit 6: Applying 2D Design:** Games that use graphics created in 2D (height X width) graphic software and are usually produced by an X and Y array of pixels. 2D games have a flat appearance. Example is Super Mario Brothers. Game systems that use 2D games are: Nintendo, Super Nintendo, PlayStation 1, Sega Genesis

2D game design elements:

* + - 1. Game Engines- - The system designed for the creation and development of video games. Software that simplifies the development process and produce games indifferent platforms.

 Tasks Game Engines perform: rendering, physics, sound, scripting, animation, AI artificial intelligence, and memory management.

 Examples: Unity, Id Tech 4, Unreal, Game Maker, RenderWare, Love, Gammas, Flashgun, ORX, Flash,

* + - 1. Sprite – 2D image or graphic inserted into a scene. A sprite is a term used in 2D game graphics that refers to a small, 2D game character or asset. Sprites do not usually have any actions associated with them. A sprite is a component that lives in the game that helps or destroys the user.
			2. Graphic- Anything of or relating to the pictorial arts
			3. Icon- A graphic symbol on a screen that suggests the type of object represented or the purpose of an available function
			4. Objects- The true entities in a 2D electronic game that do things
			5. In Game Event- On-screen prompt used to telling a player to perform some immediate action.
			6. Game Interface- The score time health and remaining ammo presented on the screen for the user
			7. Ergonomics- Identifies areas of frustration in a game level and correcting them to maintain a high level of comfort for the player. Example NES remote being so square and uncomfortable to play.
			8. Level- Layouts or drawings created by the concept artist to show all the elements in a game level.
			9. Rooms- The place (levels) in which objects live in a game.
			10. Actions- When an object goes in a certain direction at a set speed movement.
			11. Main Actions- Creating, changing and destroying instances of an object.

Game Designers Challenges: There are three major components in designing a professional video game which are: pre-production, development, and post-production.

1. challenging: Do not make a road racing game with a straight road
2. Ergonomics- People are comfortable with certain controls such as W,A,S,D for movement.
3. Hook- A unique or must have moment in a game that will attract players.
4. Wow Factor- is a 2D design concept that makes the player remember and talk about your game.
5. Levels - need to be built well, levels cannot slow down the player, must vary with difficulty
6. Target Audience- Who is the game directed towards.

 Ex: A designer must consider safety, primary colors, interactivity, simple interface, and rewards for a elementary schooled player.

2D Game Genres: Categorize video games based on their gameplay interactions rather than visual or narrative differences. Some examples are: Action games. Adventure games, Role playing games, Knowledge

1. Sports games- requires permission and licenses for content borrowed from teams and players.
2. Platform- hop and bob (Super Mario, Frogger), jumping from objects and obstacles, run and gun, and isometric are all types of Platform games.
3. Simulations- Emulates real world operations of complex machinery.
4. Reality- TV shows such as Survivor
5. Role Playing Games- has a series of quests that tell the story.

**Unit 7: 2D Game Production:**

1. Sound Effects- can be many different file types such as midi, mp3 and wav
2. Design Principles- Flexibility, balance, function and proportion
3. Foreground- To add interest to the game room and to provide a sense of depth such as fish swimming behind a piece is called foreground image.
4. Critique your game- A good way to see if your game is good or not by allowing others to play your game

 Example: Setting up a booth in a park and have bystanders try it.

1. Originality- You want your games to be original to make sure nobody else has created the idea
2. AI- Artificial Intelligence- Computer intelligence generally when a player is playing against the computer.
3. Game Backgrounds- Should be created in Photoshop
4. RGB Red, Green, Blue- Are the primary colors on the computer.
5. Cool Colors- Blue, green and purple are good to use in a cool forest or a cold lake
6. Warm Colors- Sun and fire might be painted with warm colors such as red, orange, and yellow.
7. Secondary Colors- Are created by mixing two primary colors.
8. Titled background vs. bitmap backgrounds- Tile backgrounds are simpler and require less memory or a smaller file size.
9. Parallax Scrolling- Is an example of background scrolling from left to right while the character is in front of the background
10. Parallel Projection- Axonometric or top-down perspective intentionally produces an illusion or depth
11. Scripts- Is the instructions to a game that is to be played