Game Design Project -- IDEA 2025

PROJECT DESCRIPTION:

For this project you will group up and devise, plan, and build a fully functioning game. This original game will be something you could see yourself playing with friends. The direction you go with your game should be well thought out prior to moving forward. There are several considerations when crafting a new game concept that is playable, enjoyable, and sufficiently dynamic to encourage repeated usage. Games that are too simplistic in potential outcomes or in gameplay are often not complex enough to be interesting or fun. An example of this can be found in simple racing board games such as Candyland. Due to its lack of strategy or variety of outcomes to achieve victory (you are relegated to following a predefined pathway), the game is not clever or complex and players quickly lose interest after playing the game just a couple of times. In contrast, games such as Settlers of Catan, Forbidden Island, and Pandemic, with their array of potential outcomes and permutations, provide the player with dynamic gameplay that encourages and often necessitates strategic initiative. These games provide a unique experience *EVERY TIME THEY ARE PLAYED*. Therefore, these games take much longer to become "boring". These are some of the hallmarks of a successful game.

YOUR CHALLENGE:

Recreate Chess (or Checkers) into a dynamic, multiplayer experience by expanding the board and player count, introducing new pieces and modifying existing ones, implementing a chance element, and altering the overall game objective (i.e – your goal doesn't need to be to eliminate the other player(s))..

GAME REQUIREMENTS:

1. Your game must present players with substantial changes each and every time it is played. Changes may come in the form of a variable board, pieces and elements that are not used every time the game is played, game set-up that is player dependent, rules with multiple options, etc…. Ideally, an element of chance is utilized in game set-up so that the game is always a unique experience for players. Related to this point, note the following rules:
    a. Your game MUST NOT utilize a static game board – a board that has the same layout each and every game (like Candyland – one path that never changes ...).
    b. Your game cannot be driven primarily with a deck of cards. (This does not mean cards can't be involved, but cards should not be the primary driver for what occurs in the game.) Usually, when a game is driven by cards, the game will become boring for players after only a limited number of experiences because you will get to the point of knowing (and anticipating) all of the cards. There won't be any surprises to make the gaming experience unique.

2. Cooperative games (games where all players work together to either win by achieving or lose by failing to achieve a goal), usually lend themselves better to games having large numbers of permutations and forms to maintain player interest with each experience. While not required, these types of games are strongly encouraged.

3. The game must incorporate a chance device (dice, spinner,etc...). Chess would be an example of a game with no chance element. That said, the balance between chance and strategy is up to the designers.

4. T-testing must be used to justify your claim that your chance device produces random results.

5. The game must require the use of strategy – it cannot operate solely on luck and chance alone. Flipping a coin, if that were the game, would have no strategic element to it.

6. A narrative (3-5 paragraphs minimum) sharing the backstory of the fictional world the game comes from must be written.

7. Detailed rules must be written that explain all aspects of how to play the game, use the game pieces, setup of the game, etc. Illustrations and pictures MUST be included. Consider pasting pictures into the document to simplify your instructions. ***Your instructions should be detailed enough so that people intending to play your game will not need to seek you out for clarifications***.

8. A logo must be designed to use for branding your game on packaging and documentation. While the name of your game will likely be in your logo, we will be looking for creativity in the logo so that the logo is much more than merely the name of your game in fancy letters and colors. ***There must be a hidden meaning using the principles of design we discussed earlier in the year***.

9. At least 2 comparable games that are currently being sold must be found to develop a Manufacturer Suggested Retail Price (MSRP) for a single unit of your game.

10. Material cost must be calculated that will help justify the MSRP for the game (see information on the BOM below).

11. Story, gameplay rules, and packaging must be styled in a consistent manner and should be polished and professional in their presentation. Between the UV printer, laser engravers, vinyl cutters, 3D printers, and CNC routers, you have the ability to make your games professional looking.

BUILD REQUIREMENTS:

1. All tools we have learned thus far must be used in making your game: laser engraver, 3D printer, UV printer, CNC router (either the Shaper Origin or Forest Scientific CNC routers), shop, and potentially the vinyl cutter.

2. All parts for the game must be modeled in SolidWorks and drawings produced using class drawing standards. ***Each team member must model at least two non-trivial parts required for your game and produce drawings for those parts that comply with all class drawing standards.*** More part modeling may be required depending on the number of parts your game has. Drawing do not need to be made for these extra parts. Instructors should be consulted as to whether or not a part is trivial.

3. An itemized list of materials called a Bill of Materials (BOM) should be provided listing all materials used in the construction of the game. **This should be in the form of a table with the following columns: Part Name/Description, Quantity, Size/Dimensions, Material, Unit Size, Cost per Unit, Total Item Cost**. At the bottom of the BOM should be the total cost of the materials required to make the game.

4. Each team is limited to no more than 200 grams of 3D printer filament. Other than this, no material restrictions will be imposed (within reason). That said, CV will not purchase material that it does not already have on hand.

PRODUCT DEVELOPMENT STAGES:

Stage 1 | Empathize, Define and Ideate

A. Brainstorm ideas.

B. Explore possible themes. Themes are the "feel" of the game, and can also be referred to as the "genre". (ex. Candyland's theme is simple - to beat your opponent around a board with a candy theme). What theme will your game have?

C. Explore game mechanics. What is the fundamental way a player interacts with the game. (for example in Monopoly, the mechanics are centered around dice-rolling, buying and selling property, and making money.)

D. How many players will the game support (remembering of course that you will need to be able to play it with your design group)?

E. How much of your game will be based on luck and how much on skill and strategy? (Both elements are required to some degree).

F. Will players be pitted against one another (as in Monopoly), or is it a cooperative game where, together, players seek to meet a challenge (as in Forbidden Island)?

G. How will the player/team win? Loose?

H. Pitch your idea to your instructors for approval. Complete the Project Conceptualization Form (linked to the project website). When this form is completed, as a group you will pitch your game idea to your instructors. Your instructors must be convinced your game will meet all project requirements before you will be allowed to proceed with the project. Be prepared to be rejected if you fail to convince your instructors that your game is dynamic enough to maintain interest long into the future, if the game is too simple, if the game is overly complex, or if your game is too much like a game that already exists.

Stage 2 | Prototype – Make a Mock-Up Game

A. Decide on a name and write out basic rules and narrative. These will probably change, but a basic set of rules and narrative will allow you to test and experiment as you go.

B. Create a test game. Before spending the time building real parts, it is important to create a test version of your game using paper, cardboard, and other temporary materials . . . and to play it. This will allow you to play around with the mechanics and make adjustments BEFORE investing time in creating finished parts and pieces.

C. Sketch out your game design and logo. Will you be using a board? Will there be playing pieces, dice, spinners? Sketch out what each piece will look like. This is an important step and will provide your team with an effective means to speak into and assess the overall design.

Stage 3 | Build Your Game

A. Create a project timeline. You will be shown how to create a Gantt Chart – a tool that is helpful in making sure the project gets done, gets done well, and gets done on time.

B. Assign jobs and responsibilities. Who will build what? Who is in charge of creating each aspect of the game? Make these decisions together so everyone knows what is expected of each team member.

C. Create models in SolidWorks and produce drawings. All aspects of the game must be modeled in SolidWorks with drawings produced that meet class standards.

D. Build game pieces and packaging. With your drawings as your guide, build each piece using the tools at your disposal while meeting the project requirements.

Stage 4 | Test / Improve Your Game

A. Play the game together and run final tests.

B. Write down what works and doesn't work, and modify the game rules and parts accordingly.

C. Are there parts that are confusing? See if it is possible for a player to always win if they do something specific, or if there are loopholes in the rules where a player can cheat or gain an unfair advantage.

Grading Rubric / Scoring Guidelines

Individual Scores

- Individual participation score (50 points).
  This score will be based on instructor observations, peer evaluations, and self-evaluation.
- Two fully dimensioned drawings produced using Solidworks (20 x 2 points).
  Each person's drawings must be unique and each person must model, in Solidworks, the object they create a drawing for. In other words, one person in each group cannot do all the modelling in Solidworks. Enough dimensions and notes should be provided so that the item could be created by looking at your drawing alone. If you do not believe this is possible, consult with your instructors. The parts for your drawings must be more than trivial shapes (a square block for example requiring one sketch and a simple extrude). For each part, you must use at least three of the following features you have learned in Solidworks:
  - revolve cut or extrude
  - Sweep,
  - Loft
  - Flex
  - circular or linear pattern.
- A written description of how t-testing was carried out, and how the t-test results justify your claim that your chance element is truly random in behavior. (15 points)

Game Score (30 points):

- Game is truly unique (shares only minor elements with other games).
- Game is mostly playable, enjoyable, and sufficiently dynamic to encourage repeated usage.
- Game is not overly complex, or too simplistic.
- Game incorporates a chance device (dice, spinner, cards, etc...).
- Game requires players to utilize skill and the use of strategy.

Game Component Score (80 points):

- A unique and creative logo has been designed for branding the game on packaging and documentation. Game pieces are of high quality and not overly simplistic. (For instance, a piece that might go on a playing board is more than just a rectangular solid).
- All parts necessary to play the game are provided and are of high quality.
- Some components were milled using the CNC routers (Shaper Origin or Forest Scientific table routers).
- Some components are laser engraved.
- Some components are 3D printed.
- Some components utilize the UV printer.
- Some components were created in the shop / with the shop tools.
- The use of the vinyl cutters is optional, but might be very useful in some instances.

Game Documentation Score (40 points):

- Provided a MSRP for your game (based on the cost of the materials you used to make your game). Justify the game cost (at least partially based on a comparison of similar games that are on the market). (5 points)
- A Bill of Materials (BOM) – a table listing all game components, their quantity, dimensions, and material they are constructed from. If you used vinyl and transfer tape, record here how much you used. 3D print material, both color and mass, should be recorded here for all parts. Also include material that was laser engraved or processed in the shop. Include the kind of wood, as well as the thickness of any acrylic used. Your table should be complete enough to allow someone else to build it from the materials you list. (10 points)
- A complete, error-free, and well written set of rules and instructions that explain ALL aspects of how to play the game, use of the game pieces, game set-up, example plays, etc. You MUST use pictures and diagrams to help the reader understand how your game functions. (20 points)
- Inclusion of a 3-5 paragraph narrative sharing the background story that sets the context for the game. (5 points)