ComS 437 Space Docker

In this project you will utilize 3D constructs to create a first-person game to dock a shuttle craft to a space station. However, there are a few caveats that may make it harder for the pilot of the shuttle to accomplish the task. Below is a list of required components of the game that you must implement for full credit. There is also a least of optional feature of which you must implement three or more. Note that some features count as two.

Required Elements

1. The game must be written in C# using Monogame.
2. The goal of the game is for a shuttle piloted by the user to dock with a mother ship using either keyboard or game controller controls.
3. The game and displayed using a first-person point of view. A behind the ship view is also acceptable.
4. The game must provide control by keyboard or game controller. The user may choose the input device at the beginning of the game.
5. The shuttle is some distance from the mother ship suitable for good game balance.
6. The shuttle contains a finite amount of fuel for maneuvering at the beginning of the game. The amount of fuel is determined by proper game balance.
7. The shuttle is controlled only by yaw, pitch, and roll controls along with variable thrust in the direction the ship is pointing forward or backward (reverse thrust). There are no up/down or left/right thrust controls.
8. When the shuttle activates a thrusting jet (to change yaw, pitch, or roll), an appropriate amount of fuel is consumed.
9. The shuttle contains a finite supply of torpedoes for defensive purposes. The number of torpedoes may be used to balance the game.
10. The game must create/generate several obstacles as the game progresses. The minimum requirement is that some number of asteroids (because the mother ship is travelling through an asteroid belt) moves through the playing space. You may create other obstacles if you wish. The mother ship has a shield and is not affected by an obstacle.
11. If an obstacle hits another obstacle both obstacles are destroyed.
12. If an obstacle hits the mothership only the obstacle is destroyed.
13. If an obstacle hits the shuttle some amount of damage is done to the shuttle. The shuttle has a finite amount of damage that it can take before it is destroyed, and the player automatically loses the game. These parameters are set to balance the game.
14. The shuttle may fire a torpedo in the forward direction with the ability to aim in a 20-degree cone. It is up to you how to input the aiming point from the player.
15. The torpedo is visible to the player after it is fired. An appropriate effect should be used such as a glowing ball. A torpedo may disappear from view at an appropriate distance from the player's shuttle.

16. If a torpedo hits an obstacle, it is destroyed along with the torpedo. If a torpedo hits the mother ship, only the torpedo is destroyed. The speed of the torpedo through space is determined by game balance.
17. You must create and use a skybox appropriate for the game.
18. The player wins if the shuttle is maneuvered into the shuttle bay of the mother ship with an appropriate speed.
19. The player loses if the shuttle runs out of fuel before docking or is destroyed by too much damage.
20. The game shall display the status of the shuttle, including fuel left, torpedoes left, and current damage.
21. You are required to use the BEPU physics engine to move objects in the play area.

Optional Elements

1. The mothership is moving instead of stationary.
2. The mothership is hostile and fires torpedoes back at the shuttle ship. In this case, you are the shuttle pilot trying to breach the enemy mothership. This counts as two options.
3. Small fuel and torpedo buoys are scattered around the mothership that allow some amount of recharge of the shuttle fuel tanks or torpedo supply.
4. The ship can shield against an obstacle; however this requires the use of fuel during the time it is activated. A visible indication is required when the shield is activated.
5. The shuttle can create a wormhole that will instantly transport it to another position. This also requires fuel. Option to the option: The more fuel that is used, the less the probability the shuttle is destroyed in the wormhole.
6. The game is networked so that it allows for two-player combat with the winner being the first person to get to the mother ship. This counts as all three options.
7. Propose an option for approval and then implement.