

Pirate Ship

Project Proposal



Figure 1. An illustration of a pirate ship




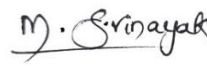





(Source:https://www.pngfind.com/download/TiRhTbh_piracy-boat-icon-pirate-ship-hd-png-)

Prepared by: Group 19

Pirate Ship

Group 19

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Introduction and Motivation

Introduction:

One enduring symbol of this maritime world is the pirate ship. The sea has beckoned adventurers, dreamers, and pirates for centuries with its endless horizons and untold mysteries. It embodies the spirit of exploration, freedom, and adventure. This project goes beyond simply building a pirate ship; it is a journey into history, creativity, and craftsmanship.

Thousands of pirates terrorized maritime channels all over the world, especially in the Atlantic and Indian Oceans, when they were first introduced during the so-called "Golden Age" of piracy (approximately 1700–1725). Excellent ships that could elude pirate hunters and naval vessels and rush down their target were necessary.

What is a Pirate Ship?

Any ship whose crew members are involved in piracy is a pirate ship. Consequently, a pirate ship may be anything from a small canoe or raft to a large frigate or ship of war. Pirates could, and often did, use tiny vessels, including canoes, as a last resort.

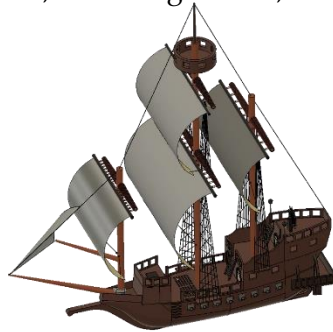


Figure 2. An illustration of a pirate ship
(Source: <https://www.google.com/search?q=pirate+ship+autodesk&tbm=isch&ved=2ahUKEwiCulCuvqeBAxWKza>)

What Features Did Pirates Want in a Ship?

A good pirate ship needed to have three characteristics: it needed to be swift, seaworthy, and well-armed. Seaworthy ships were required for the Caribbean, where deadly hurricanes occur regularly. They were opportunistic and would often steal their boats and then rename the ship to something suitably pirate.

But there were a few features a pirate would look for in their ideal ship:

1. **Speed:** The ideal pirate ship would be fast and agile to catch up with its target and then quickly escape to avoid capture.
2. **Size:** A pirate ship must be big enough to house a large pirate crew plus all their plunder but small enough to keep it fast and light in the water

Motivation:

The motivation to embark on this endeavour is multifaceted, drawing inspiration from historical fascination and personal passion. Let's delve into the reasons that fuel the desire to create a pirate ship.

Another big motivation has been the anime "One Piece" for us. "One Piece" is known for its incredible and expansive world filled with diverse islands, characters, and mysteries. The series offers adventure and discovery as the main characters explore the Grand Line, searching for the legendary One-Piece treasure. The anticipation of what they will encounter next can be highly motivating.

The bond between the Straw Hat Pirates is a central theme in "One Piece." Their unwavering loyalty, friendship, and willingness to sacrifice for one another can be a powerful reminder of the importance of meaningful connections.

1. Love for Maritime History:

At the heart of this project lies a deep-seated fascination with maritime history. The allure of ancient ships, their evolution through the centuries, and the tales of fearless explorers and notorious pirates have captivated the imagination. By building a pirate ship, one can immerse themselves in a hands-on exploration of nautical heritage, uncovering the secrets of ship design, navigation, and the art of seafaring.

2. Embracing Pirate Legends:

Pirate legends have woven their way into the fabric of our culture. From Blackbeard to Captain Jack Sparrow, these swashbuckling characters have left an indelible mark on our collective consciousness. The motivation to craft a pirate ship is partly driven by a desire to bring these legends to life. Building a tangible representation of the pirate world allows for a deeper connection to these larger-than-life figures and the myths they embody.

3. Imagination and Creativity:

Creating a pirate ship is a canvas for boundless imagination and creativity. It offers an opportunity to design and build a vessel that may have never existed, blending historical accuracy with personal flair. From the ship's figurehead to its rigging, crafting intricate details allows for artistic expression and a sense of accomplishment.

4. Educational Value:

Everyone has an equal voice. The articles were created democratically, and they stipulated that every party had to agree before an expedition could begin. They establish the crew's rights and responsibilities, the procedures for resolving conflicts, and the rewards and insurance payouts that guarantee courage in combat and recompense wounded crew members.

5. Recreating History:

Recreating a pirate ship is akin to stepping back in time. It allows enthusiasts to immerse themselves in a bygone era, experiencing life's sights, sounds, and sensations aboard a seafaring vessel. By meticulously researching and replicating historical designs, one can pay homage to the sailors and pirates of old age, keeping their legacy alive tangibly and tangibly.

Conclusion:

In summary, the motivation to make a pirate ship is a rich tapestry woven from a love for maritime history, a fascination with pirate legends, a thirst for creativity, a hunger for knowledge, a reverence for history, and a yearning for adventure. This project transcends mere construction, a voyage into imagination and exploration. It is a testament to the enduring allure of the sea and the enduring fascination with pirates who once ruled its waves. So, hoist the Jolly Roger, set your course, and embark on this epic journey to craft your pirate ship, where history, fantasy, and craftsmanship converge.

Sources

- https://pirates.hegewisch.net/Nautical_Myths.html
- <https://hbswk.hbs.edu/item/what-pirates-have-to-teach-us-about-leadership>
- [https://www.thoughtco.com/pirate-ships-overview-2136229#:~:text=A%20pirate%20ship%20is%20defined,nothing%20else%20was%20at%20hand.\)\](https://www.thoughtco.com/pirate-ships-overview-2136229#:~:text=A%20pirate%20ship%20is%20defined,nothing%20else%20was%20at%20hand.)\)
- <https://www.ethicalsystems.org/what-pirates-have-to-teach-us-about-leadership/>
- <https://www.historicships.com/product/pirate-adventure/>
- [Stacke, Nicole and Bos,Marie\(Piracy: Motivation and Tactics The Case of Somali Piracy, 2009\)](#)

Part Name: - Deck

Madhup Sankhla (23110190)

Introduction

Building a Pirate Ship is an exciting endeavour that combines craftsmanship, engineering skills, and boundless creativity. As we embark on this project, we're drawn into a realm of adventure and history. Pirate ships, notorious symbols of rebellion and exploration, have captured the imaginations of people for centuries. The deck, a central component of these maritime marvels, holds a unique significance in the construction of our pirate ship.

Pirate ships stand as enduring symbols of an era characterised by daring feats, lawlessness, and the pursuit of treasures hidden across uncharted waters. Our decision to recreate one of these iconic vessels reflects a deep passion for history, craftsmanship, and the art of bringing dreams to life through woodworking and engineering.

Deck

The pirate ship's deck is a rugged and bustling place where the crew carries out various tasks essential for their life at sea. It's often made of weathered wooden planks, and it's divided into different areas for specific functions; The top or primary deck will be strengthened around deck fittings like the capstan, cleats, or bollards in order to provide structural integrity, weathertightness, and support for personnel and equipment.



Figure 3. An illustration of a deck

(Source:<https://www.google.com/search?q=pirate+ship+autodesk&tbm=isch&ved=2ahUKEwjCuJCuyqeBAxWKzaACHYcJB>)

- **Working**

Despite the mythical stature that pirates and their ships have acquired, A pirate ship operated just like any other type of company. Each team member had a specific role to play and a set of tasks that went along with it. Life on a pirate ship was far less strict and controlled than it would have been aboard an official Naval ship or a commercial ship of the era.

The pirate ship's deck is vital to the crew's life and overall function. The main deck was also a communal space where the team ate and socialized, comprising everything from navigation and combat to daily activities and socialization. It was a multifunctional space where the crew carried out the various tasks for their seafaring adventures.

1. Foredeck: Located at the front of the ship, it houses the anchor and windlass used for dropping and raising the ship's anchor.

2. Main Deck: This is the central area where most of the crew's activities occur. It's where cannons are placed, cargo is stored, and the ship's wheel and compass are mounted.
3. Aft Deck: Positioned at the ship's rear, the aft deck is where the captain's cabin is situated, along with the critical ship's wheel and compass equipment.
4. Cannons: Pirate ships are armed with cannons on both sides of the main deck, used for defence and attacking other ships.
5. Cargo Hold: Beneath the main deck is the cargo hold, where treasures, supplies, and food provisions are stored.
6. Anchor Handling: The foredeck holds the anchor and windlass, essential for dropping anchor when to stop or preparing to board another ship.

- **Possible Challenges**

While fitting the other parts on the deck, we may deal with issues since we are new to Autodesk Inventor; we need to be aware of its highlights, like how to utilise it and some more challenges we can look at while dealing with it. Designing the deck will be a complex task. We are also still trying to figure out where to fix the deck's dimensions. You're in a highly introductory phase of learning Autodesk inventor, so, at this m, king a pirate ship's deck easily.

In conclusion, creating a pirate ship's deck is a challenging and gratifying project that draws on an extensive mix of tradition, skill, and invention. We are prepared to revitalise a piece of nautical history as we dig into the details of this project, taking inspiration from historical sources and utilising modern design techniques.

- **Source**

1. [https://take a lot of workia.org/wiki/Deck_\(ship\)](https://take a lot of workia.org/wiki/Deck_(ship))
2. <https://www.thoughtco.com/positions-duties-on-a-pirate-ship-2136230>
3. <http://www.thewayofthepirates.com/pirate-ships-info/ship-parts/>
4. <https://blogdigger.com/pirate-crew/>

Part Name: - Cannon

Luv Agarwal (23110189)

Introduction

In the vast stretch of ocean, anything can happen at any time. There is no guarantee of survival on a voyage. A pirate's life is in its ship and its crew. And it is necessary to be protected, Pirates used heavy cannons, muskets, pistols, cutlasses, and grenades among other weaponry to wreck havoc on the seas. Cannons were an integral part of ships. For example, early Roman ships exclusively used oil pots and cannon balls to raise a war at sea. However, the cannon did not establish a foothold aboard European vessels until the Sixteenth Century, 200 years after its introduction in the continents' armies. The main reason was the portability of cannons. These cannons were used for both offense and defense during naval battles. They were the reasons for many defeats and victories.



Figure 4. An illustration of a Cannon
(Source:<https://www.google.com/url?sa=i&url=https%3A%2F%2Fstock.adobe.com%2Fsearch%3Fk%3Dpirate%2Bcannon&p>)

Basic Structure

A cannon's main body comprises three crucial extensions: the chase and the reinforce. The chase is the longest and the first extension. The cascabel or cascabel is the nearest and shortest part. The middle portion is called reinforce.

The chase: It is a specially designed conical vessel present at the face of reinforce. It is the most extended part of the cannon, and it has the following parts.

- The neck: the chase's narrowest and tiniest section, always found close to the cannon's leading end.
- The muzzle is the neck-forward region of the pursuit. It consists of the following elements. The term "swell of the muzzle" describes the modest increase in muzzle diameter towards the very end of the pursuit. The intention was to make loading the cannon easier, for this muzzle used to be put inside. Sometimes, a broad ring called a muzzle ring takes its place.
- The reinforce: It consists of a first reinforce and a second reinforce, but in any event, it may be distinguished from the chase by the existence of a thin, circular reinforce ring or band at its leading end.

The reinforce has the following parts:

- The trunnions are situated immediately behind the reinforce ring at the front end of the reinforcements. The cannon's carriage is mounted on two cylinders that are perpendicular to the barrel underneath it.
- At the intersection of the trunnions are the short, wide rings known as rimbases.
- The cascabel is the part of the cannon that is situated behind the reinforce(s) and the base ring. This is among its components:

The piece's tiny spherical terminal, known as the knob.

The neck holds the knob out, a tiny and shallow piece of metal which is very thin in dimensions

- **Working**

Near the closed end of the barrel, a touch hole, or tiny hole, was dug in the barrel wall.

The powder was carefully measured and placed in a shaped bag. The powder room contains these bags. In the battle, a runner would take the powder from the powder room to the cannons. A rammer tool was used to put gunpowder through the muzzle into the cannon's core. The cannon balls did not fit securely in the barrel of the gun because of the primitive manufacturing methods used then. But it used to serve the purpose. The cannon would send the balls by creating the necessary spark.

- **Possible Challenge**

1. Fitting the cannon back into the ship could be a nightmare.
2. Getting accustomed to the techniques in Autodesk Inventor would not be easy.
3. Designing the dimension of canon in proper coordination with other teammates
4. Wheels also have to be made for cannons.

- **Sources**

1. <https://pirates.hegewisch.net/ships.html>
2. <https://www.worldhistory.org/article/1825/pirate-weapons-in-the-golden-age-of-piracy/>
3. https://en.wikipedia.org/wiki/Cannon#Materials,_parts,_and_terms
4. <https://thepirateempire.blogspot.com/2014/01/pirate-cannons-and-how-they-work.html>

Part Name: - Ship Interior

Maitri Chaudhary (23110192)

Introduction

The inside of a pirate ship would have been quite cramped and crowded, as they were designed to carry as many goods and people as possible. The main deck would have been used for storing cargo and housing the crew, while the upper decks would have been reserved for the captain and other officers. There would have been a few small cabins for the captain and other important crew members. There would have been a few small storage rooms for food and supplies. Pirate ships also had a few small areas set aside for navigation and steering, such as the helm and the chart room. Overall, the inside of a pirate ship would have been quite spartan and functional, with little room for luxuries. The pirate ship interior has many parts like Capcaptain'sbin, Quarter Deck, Galley, Bilge, Bridge, Cargo holders, Crews Nest, Ladderways, Passageways and other Decorative items like flags and other embellishments. Some of them are discussed below:



Figure 4. An illustration of a Ship Interior
(Source:<https://www.google.com/search?q=pirate+ship+railing&tbm=isch&ved=2ahUKEwimabCOzqeBAxV-z6ACHdzBBCcO2>)

- **Quarter Deck**

The quarterdeck of a pirate ship is a distinctive and important area of the vessel, laden with both practical and symbolic significance. Situated at the stern of the ship, it's a raised platform that provides the ship's captain with an advantageous vantage point to oversee all activities on deck and to command the crew during manoeuvres and battles.

- **Gallery**

The cooking area on a ship is known as the galley, and it is often designed with longitudinal sections and overhead closets for maximum efficiency. This maximizes the utilization of the typically constrained space on ships. Additionally, it takes into account how ships roll and rise and fall, making them better suited to the impacts of ship motion.

- **Railings in Ship**

On a pirate ship, railings serve several important functions, just like they do on any other type of ship. Pirate ships were typically adapted or modified from existing vessels, so their railings and overall design would have varied depending on the

specific ship and its purpose. Railings on a pirate ship, as on board any vessel, were primarily intended to provide safety for the crew. They help prevent crew members from accidentally falling overboard during rough seas or intense battles. It provides Structural support; Lookout points and Crew members could take shelter behind the railings while firing cannons or muskets at enemy vessels. The railings could be used for a variety of purposes, such as securing loot or prisoners, hanging lanterns or ropes, and stowing equipment. The design of railings on pirate ships would ultimately depend on the practical needs and preferences of the crew.

- **Challenges**

There are many challenges faced while designing the interior of the ship. Ships have limited space, so maximizing functionality and comfort within a confined area is crucial.

- **Stability and Safety:** Interiors must be designed to ensure the security and strength of the ship, accounting for rough seas and potential emergencies.
- **Materials and Finishes:** Choosing materials that are durable, corrosion-resistant, and suitable for marine environments is essential.
- **Accessibility:** Meeting accessibility standards for passengers with disabilities can be complex on a ship.
- **Environmental Considerations:** Incorporating eco-friendly design elements and sustainable practices is increasingly important.
- **Maintenance:** Designing interiors that are easy to clean and maintain in a marine environment is vital for long-term functionality.
- **Cost Constraints:** Balancing design aspirations with budget limitations can be challenging.
- **Aesthetics:** Creating visually appealing interiors that align with the ship's branding or theme can be a creative challenge.
- **Crew Comfort:** Designing crew areas that are both functional and comfortable, as they spend extended periods onboard. Successfully navigating these challenges involves collaboration among architects, engineers, interior designers, and maritime experts to create safe, functional, and aesthetically pleasing ship interiors.

- **Source**

- <https://en.wikipedia.org/wiki/Quarterdeck>
- <https://en.wikipedia.org/wiki/Galley>

Part Name: - Helm of the ship, Bowsprit

Makkena Lakshmi Manasa (23110193)

Introduction

Our group is working on Crafting a Pirate ship. Pirate ships are controlled by pirates and used to conduct piracy upon the rivers ,seas and bays. Pirate ships are beautifully designed to accommodate many people and their needs. They also contain so many creative things to find the location of their enemies and to attack them. Many kinds of ships are designed depending on climate, people, and traditions.

Our model has about 15 parts, of which I have been assigned the work of two parts, namely the helm and the Bowsprit. Both are crucial for a pirate ship.



Figure 5. An illustration of a Bowsprit

(Source:https://www.google.com/search?sca_esv=564995893&q=Helm+of+the+ship,+Bowsprit+pirate+ship&tbm=isch&source=lnms&sa=X&ved)



Figure 6. An illustration of a Helm

(Source:https://www.google.com/search?sca_esv=564995893&q=pirate+ship+interior&tbm=isch&source=lnms&sa=X&ved)

Helm

Structure and Functions

Helm serves as the command center for steering the ship and determining its course on the open seas. The helm is typically located on the upper deck or the bridge of the ship, providing the helmsman with a commanding view of the surroundings. Turning the wheel clockwise or counterclockwise controls the orientation of the rudder, which in turn, directs the ship's movement. The helm is not only a practical instrument but also a symbol of authority and command a pirate ship. The helm is a crucial part of a pirate's ship operation. The helm becomes a symbol of pirate lore and is often associated with the romanticised image of pirates in popular culture, including movies and literature. Helm is generally a large wooden wheel with several spokes. The wheel's size could vary depending on the size of the ship, but it was often quite large to provide the necessary leverage for steering.

Possible Challenges

I think I will face a challenge due to its complex geometry. Helm typically has intricate designs with many curved and detailed components. Creating these shapes accurately can be challenging. Mainly the helm needs to look realistic.

Bowsprit

Structure and Functions

The bowsprit of a pirate ship is a vital and distinctive feature of the ship's design. The bowsprit is a large protruding spar (a long, slender, and sturdy pole) that extends forward from the front of a sailing ship, especially from the ship's bow. It's an integral part of the ship's rigging and structure. The primary purpose of the bowsprit is to extend the ship's rigging and allow for the attachment of various sails and rigging components. It provides additional space for sails, increasing the ship's sail area and, therefore, its ability to catch the wind and propel the vessel. Bowsprits vary in shape and size depending on the type and era of the ship. They can be straight or slightly angled upward. The bowsprit plays an important role in maneuvering the ship. By adjusting the sails attached to it, the crew can control the ship's balance and handling, especially in strong winds or when changing course. In the context of pirate ships, bowsprits were crucial for maximizing speed and agility. The bowsprits and other rigging and sails contributed to the pirate ship's iconic appearance and ability to navigate the high seas effectively through different weather conditions.

Possible Challenges

This part of the ship is simple to design. I don't think I will face any issues in modelling this part. However, we might face some challenges in assembling the model, specifically in this part.

Part Name: Name of the ship and Flag of the ship

Name: Manaswi Mandava (23110196)

Introduction:

We have chosen to plan a three-dimensional model of pirate ship . A pirate ship is a sailing vessel used by a person who commits robbery on the seas. Pirate ships were purpose-built or repurposed vessels that allowed pirates to operate effectively on the high seas. A period of time known as the "Golden Age of Piracy" (1690–1730) saw a boom in robberies on the high seas and in colonial ports. Although not all historians agree on the precise historical time, it is commonly attributed to pirates who operated in the Caribbean, along the east coast of America, in the eastern Atlantic, and in the Indian Ocean.

There are several factors in the emergence of the age of piracy:

1. Warfare and unemployment
2. Political instability
3. Vulnerable shipping lanes
4. Pirate havens

These pirate ships are identified by a famous flag named "JOLLY ROGER".

Flag of the Ship:

One particular style of pirate flag is the Jolly Roger, which has a black backdrop with a white human skull perched over two white crossed bones. Flags were developed so that they might function as a universal language for ships to communicate across great distances. They frequently displayed the flags of their native nations. It is known that an English Admiralty Law went into force in 1697, mandating that all privateers fly "Red Jacks" (a red flag) to help them stand out from their Navy ships. The privateers were ordered to raise their black flag to signal that no compassion would be shown if the ship they were assaulting did not surrender immediately. Many privateers continued their careers as pirates after the War of the Spanish Succession ended in 1714, and it is believed that they did little more than decorate these black and crimson flags with their designs. So while making the flag we need to select the proper background colour and a proper design for it.



Figure 7. An illustration of a Flag
(Source:https://www.google.com/search?sca_esv=564995893&q=flag+of+pi)

Name of the Ship:

The name of our ship is "BLACK PEARL". In the Pirates of the Caribbean movie series, the mythical ship The Black Pearl, formerly known as The Wicked Wench, appears. The ship's unique black hull and sails make it simple to identify. So for writing the name of the ship we use a different type of font which appears attractive to the people who view it. A ship's name design is a creative process that captures the spirit, function, and identity of the ship. Proper names of ships should be italicized just as titles are.

Challenges to be faced

Creating a flag in Autodesk is very fun but there are many challenges to be faced. The common challenges that might face are Complex Shapes: Flags often have complex designs, Creating these shapes accurately in Autodesk Inventor can be challenging, primarily if they involve curves or irregular patterns. Texture Mapping: Applying the correct textures and patterns to the flag can be challenging. Ensuring that the flag's design aligns properly with its shape and draping can take some time and effort. There might be a lot of difficulties with developing textual elements into a 3D model, as it might not be as simple as it looks while designing the name of a ship using Autodesk. The size of the ship's name is crucial for readability and visual balance. If it's too small, it may not be visible in renders or physical prints. If it's too big, it can overwhelm the design.

Sources

1. [Golden Age of Piracy - World History Encyclopedia](#)
2. [Jolly Roger - Wikipedia](#)
3. [Let's Learn About Pirate Ships - and Make Our Own! - Super Simple](#)
4. [Black Pearl - Wikipedia](#)

Part Name: Anchor

Name: Siddhivinayak Maloth (23110194)

Introduction:

We had decided on our project's topic as PIRATE SHIP. Welcome to the thrilling world. According to Wikipedia Pirate ships include ships operated by pirates and used for conducting piracy upon the rivers, bays and seas. In this thrilling project, we'll be setting sail on the high seas of 3D design as we embark on the quest to create a majestic pirate ship like no other. From daring adventures to unique designs. From these project my part is Anchor. For these project Anchor place main role. Anchor for a ship is a crucial maritime device used to keep a vessel in place by securing it to the seabed or bottom of a body of water. It serves as a means to prevent the ship from drifting due to wind, currents, or tides. They are attached to the ship by a chain or cable, and when deployed, they grip the bottom to provide stability. Anchors have been an essential tool for navigation and safety at sea for centuries.



Figure 8. An illustration of an Anchor

Types of anchors:

There are many types of anchors used in Different ways for different types of ships.

-Here we go main anchors used:

1. Wedge Anchor
2. Sleeve Anchor
3. Drop-in Anchor
4. Expansion Anchor
5. Concrete Screw Anchor
6. Toggle Bolt Anchor
7. Wall Anchor

8. Hollow Wall Anchor
9. Masonry Anchor
10. Chemical Anchor and so on..

About Anchor and Chain:

An anchor and chain are the main points of a ship's equipment for safe anchoring and navigation. Here's some information about anchor and chain:

1. Anchor:

- An anchor is a heavy object, it is made of steel, that is lowered to the seabed to prevent a ship from drifting and safety.
- It typically has a central shank with arms (flukes) that dig into the seabed, providing grip and protection from drifting.

2. Anchor Chain:

- The anchor chain is a very strong, linked chain that connects the anchor to the ship.
- Its weight helps maintain a downward force on the anchor, ensuring it stays securely embedded in the seabed.
- The chain control length of the anchor rod.

Classification rules on Chain and Anchors:

- The Anchor & Anchoring equipment are used before or at critical places only coasts in rough weather or to stop a ship which is moving or drifting. There are some precautions should be there. A current speed of not more than 3 m/sec
- A wind speed of not more than 20m/sec
- Depth of water ranging between 80 M and 110M.
- The main is ground should be sandy or muddy and not rocky
- The length of chain provided varies between 85 M to 750 M. It depends upon various ships and boats.

Principle:

The principles of selecting an anchor size for a ship involve finding the right

balance between not being too short and not being too long (excessive weight). Here are some key considerations:

1. **Weight Adequacy:** The anchor's weight is sufficient to hold the ship in place under various conditions, including wind and current.
2. **Anchor Material:** The materials like galvanized steel are common due to their durability in marine environments and it is the best material.
3. **Environmental Conditions:** It leads the main role accounting for the typical weather and sea conditions where the ship will operate, as this can impact the required anchor size.
4. **Safety Margins:** Incorporate safety margins into your anchor size selection to ensure it can handle unexpected conditions or dangerous times.

Possible Challenges:

There are some possible challenges which I found. This is my first project. Firstly, I don't know anything about these project. What Should I do? Later on I learned a lot of things. Designing anchors and chains in Autodesk Inventor can be challenging due to complex geometry, material properties, assembly constraints, and the need for accurate simulations. Parametric design and proper documentation.

Sources :

1. <https://youtu.be/ANfvR72Q3KE?si=wWmae53PcROpn4wU>
2. <https://all-free-download.com/free-vector/anchored>

Part Name: Rigging, and Sail

Aniruddh Reddy Mamilla (23110195)

Introduction:

Our group is working on modelling a pirate ship. Pirate ships were primarily used by pirates during the "Golden Age of Piracy". It is estimated roughly from the late 17th century to the 18th century. Pirate ships were unique boats used by pirates, who were like sea robbers in the olden days. Usually, these ships are fast, strong, and equipped with cannons. Pirates used these ships for sailing seas, finding treasure, and attacking other ships for valuable stuff. Pirates prefer smaller and faster ships. Our model has some parts, of which I have been assigned to model two parts: rigging, and Sail. These two parts play a critical role in the functioning of the ship.



Figure 9. An illustration of an Rigging
(Source:<https://www.google.com/search?q=Rigging%2C+and+Sail+pirate+ship&tbm=isch&ved=2ahUKEwjbuOH50KeBAxV3mmMGHXV>)

Rigging:

- **Structure and functions**

Rigging comes from the rig, to set up or prepare. Rigging is the equipment such as wire rope, shrouds, turnbuckles, clevis, and jacks used to support and operate the masts, sails, booms, and yards of a ship. The purpose of rigging is to raise, lower, shape, and control the sail. There are two types of rigging namely

- 1) Wires, rods and other equipment like rods which are used to support mast on a ship going on sails. They also help in protecting against strong winds which occur during sails.
- 2) Running rigging comprises movable rigging elements that adjust the sails' position and shape.

- **Components of the rigging**

- 1) pulley are used to connect the ends of the lines to reduce the strength to manipulate the rigging.

2) Dead eyes are round and thick wooden discs with one or three holes running through which lines are secured. They are used for guiding, controlling, and shading the direction of lines.

3) Belaying pins are wooden baton used to secure the lines of rigging they are inserted in holes in these strategically located, pin rails found along the sides of the ship or around the base of mast, the line secured to a pin and excess is coiled around it belaying pins could also use as weapon's

Possible challenges

This part of the ship is pretty simple to design. I don't think I will face any issues in modeling this part. However, we might face some challenges in the later stages of assembling the model, specifically in this part.

The figure of rigging components

Sail:

- **Structure and Functions**

A sail is a large canvas sheet used to catch the wind and propel the ship forward. Most sails are made up of linen and have a slightly brown or gray tint. Cotton sails are pure white and familiar enough in the Caribbean and Pacific regions, especially on Spanish ships. Sails were not made in one piece but rather multiple pieces stitched together. There are two mainly two types of sails: They are

1) Square sails

2) Fore naft sail

- **Square sails**

Square sails are square in shape and face the same direction as the heading of the ship. They are most effective when running that is sailing downwind.

- **Fore naft sails**

Fore naft sails are triangular in shape and set along the length of the ship. They are attached to spars, which are connected to the mast of the ship. The benefit of fore raft sails is that they can catch more wind when it is hitting against it but perform worse with the wind.

Possible challenges

While modeling the sails, we may deal with issues since we are new to Autodesk Inventor, we won't be aware of its highlights like how to utilize it and some more challenges we can look at while dealing with it.

Sources:

1. <https://youtu.be/ybMUEduwGi0?si=IGIfX3QAmXINSOW7>
2. <https://en.wikipedia.org/wiki/Piracy>

Part Name: Tower, Crow's Nest

Name: Manushree Dayaram Sonawane (23110199)

Title: Crafting a Pirate Ship: A Journey into Maritime Adventure

Introduction:

We have chosen to plan a three-dimensional model of pirate ship. A pirate ship is a sailing vessel used by a person who commits robbery on the seas. Pirate ships were purpose-built or repurposed vessels that allowed pirates to operate effectively on the high seas.

The Conning Tower and the Crow's Nest are the guardians of maritime safety. The world's oceans have been a realm of mystery and danger, where pirates and sailors have ventured into the unknown, facing the wrath of the water and unseen hazards.

In this perilous environment, safety is something which cannot be overlooked. The Conning Tower and the Crow's Nest are two such crucial components that ensure the safety of the navigation of the ships. They hold a special place in maritime history and are critical to a safe ship.



Figure 10. An illustration of a Crows Nest
(Source:https://www.google.com/search?sca_esv=565014946&q=Tower,+Crow%E2%80%99s+Nest+pirate+ship&tbm=isch&source=lnms&sa=X&ved=2ahUKewiS)

The Conning tower:

The naval term “conn” is supposed to be derived from the Middle English conne meaning to become acquainted with. It is an elevated, frequently armored platform on a ship or submarine from which the commanding officer may direct the ship's movements.

Instructions to personnel in charge of the ship's ground equipment. It is often situated high on the boat to provide the conning crew an excellent vision of the whole ship, the ocean, and other vessels. It also symbolises innovation, stealth, and control beneath the ocean's surface.

The conning tower's specific purpose is to house the periscope which captures images from the surface of the ship. It also serves as a vital command centre, equipped with navigation instruments, communication systems and controls for driving and surfacing. They also house crucial safety features.

Crow's Nest

The crow's nest is perched high on the masts of sailing ships and embodies the spirit of adventure, lookout, and early warning against approaching dangers. Its use was not limited to only look at other positions but also provided wide range of view that helped guards to protect the ship from upcoming damages or hazards. With the help of instruments like telescopes or binoculars, they used to detect forthcoming land.

This concept of a lookout platform can be traced back to ancient times when mariners used elevated positions to understand their surroundings better. However, the modern crow's nest as we know it emerged during the Age of Exploration and reached its zenith during the Golden Age of Sail in the 18th and 19th centuries.

Since the crow's nest is a point far away from the ship's centre of mass, the ship's rotating movement is accentuated and may cause severe seasickness. Consequently, going to the crow's nest was viewed as a punishment as well!

Possible Challenges that can be faced during designing the parts on Autodesk:

1. **Complex geometry:** The intricate shapes and features can be time-consuming and challenging to design. Accuracy is very crucial in naval architecture.
2. **Interference and Clearance issues:** It is essential to check for interference problems as the components interact with other ship components.
3. **Large Assembly Performance:** Conning towers are typically part of larger ship assemblies. Handling large assemblies may lead to performance issues.
4. **Resources Constraints:** Complex design projects may require significant computational resources.
5. **Structural Integrity:** Conning towers must meet structural integrity and safety requirements. Analyzing the structure using Autodesk Inventor's simulation tools to ensure it can withstand the expected loads and conditions.

Successfully navigating these challenges involves collaboration among architects, engineers and interior designers and maritime experts to create safe, functional and aesthetically pleasing ships.

Part Name: Exterior of Ship and Deck boundary

Name: Mangalsing Thakare (23110197)

Introduction

Creating a 3D model of the exterior of a pirate ship in Autodesk Inventor is a thrilling adventure that blends engineering with a touch of swashbuckling imagination. This Endeavor enables me to breathe life into the iconic vessels of the high seas, capturing every intricate detail of their rugged charm. From the menacing silhouette of the ship's hull to the intricate carvings on the figurehead, Autodesk Inventor empowers me to craft a digital masterpiece that embodies the spirit of piracy. This creative journey allows me to combine my 3D modelling skills with a dash of historical flair, resulting in a stunning representation of a pirate ship that's ready to set sail on the virtual ocean. Throughout this voyage, I will navigate Autodesk Inventor's tools and features, honing my ability to recreate the ship's unique design. So, hoist the Jolly Roger and prepare to embark on an unforgettable journey to model the exterior of a pirate ship like never before.



Figure 11. An illustration of an exterior of ship
(Source: <https://images.app.goo.gl/67eTxCFQftUU4cYY9>)

Information about Part

The exterior of a ship, often referred to as its hull, is a critical part of its design and functionality. Portholes and Windows: For light and ventilation, ships typically have portholes or windows in their superstructure. The design and maintenance of a ship's exterior are crucial for its safe operation, longevity, and overall efficiency in performing its intended tasks. There are doors for going outside. Which directly connected to the base room of the pirate ship.

Deck boundaries help guard the ship from external natural and manmade attacks. Therefore, it plays a major role in security of ships.

Fundamental working principles for the exterior design of a ship:

Hydrodynamics: The shape of the ship's hull is critical for efficient movement through water. It should be designed to minimize resistance and ensure stability. Factors like hull shape, length, beam, and draft are carefully considered.

Stability:

Ensuring the ship's stability is essential to prevent capsizing. This involves calculating the metacentric height (GM) and ensuring it falls within safe limits.

Weight Distribution:

It works on Archimedes principle because proper weight distribution is vital for maintaining the ship's stability and trim.

Resistance and Drag Reduction:

This includes optimizing the bow and stern shapes. Streamlining the ship's exterior design to reduce resistance and drag in the water helps improve fuel efficiency and speed.

Sailor Propulsion System:

Depending on the type of ship, the choice of propulsion (e.g., sails, engines, or a combination) impacts the design of the exterior. Sails require masts and rigging, while engines necessitate engine rooms and exhaust systems.

The exterior design of a ship requires a multidisciplinary approach, involving naval architects, marine engineers, and safety experts. Balancing these principles ensures that the ship is not only functional but also safe, efficient, and compliant with regulations.

Problem faced

1. **Complex Surfaces:** Ships often have complex, curved surfaces. Modelling these accurately can be challenging.
2. **Scale:** If scale of any part of the exterior of the ship is wrong, then the whole model will be faced to recreate.
3. **Lack of References:** Finding accurate reference materials or blueprints for the pirate ship modelling can be a challenge.
4. **Curves:** In the model of the exterior of the ship, there are curves, which are really tough for me to do in Autodesk Inventor.

Conclusion

Ultimately, the design of the exterior of a pirate ship in Autodesk Inventor is a rewarding endeavor that combines artistic flair, technical skill, and a passion for maritime history. It allows me to create a digital masterpiece that embodies the romance and intrigue of pirate lore while showcasing my proficiency with cutting-edge design software.

Source:

1. <https://www.autodesk.com/support/technical/article/caas/sfdcarticles/sfdcarticles/Inventor-Trying-to-put-an-image-on-a-face-of-a-model.html>