PROJECT TWO: MILESTONE 1 – COVER PAGE

Team Number: THURS-12

Please list full names and MacID's of all *present* Team Members

Full Name:	MacID:
Yuvraj Sandhu	Sandhuy
Eric Hitsman	hitsmane
Chengyao Liu	liuc169
Couper Smith	smitc25

MILESTONE 1 (STAGE 1) – PRE-PROJECT ASSIGNMENT

Team Number: Thurs-12

You should have already completed this task individually prior to Design Studio 7.

1. Copy-and-paste each team member's list of objectives, constraints and functions on the following pages (1 team member per page)
    a. Be sure to indicate each team member's Name and MacID

We are asking that you submit your work on both worksheets. It does seem redundant, but there are valid reasons for this:

- Each team member needs to submit their list of objectives, constraints and functions with the **Milestone One Individual Worksheets** document so that it can be ***graded***
- Compiling your individual work into this **Milestone One Team Worksheets** document allows you to readily access your team member's work
    - This will be especially helpful when completing ***Stage 2*** of the milestone

Team Number: Thurs-12

Name:Eric Hitsman	MacID:hitsmane

Objectives

- Easy for machine to access
- Holds tools securely
- Tools return to same spot every time

Constraints

- Must be secure
- Must not exceed 350g
- Container must be smaller than grabber

Functions

- Hold surgical tools
- Sort containers

Team Number: Thurs-12

Name: Chengyao	MacID: liuc169

Objectives

Easy to be picked up by the robotic arm.

Able to hold the surgical tools securely.

Constraints

M<=350g

Functions

Able to securely hold surgical instrument.

Held by robotic arm stably.

Classify the surgical tools by colors.

Team Number: Thurs-12

Name: Yuvraj Sandhu	MacID: Sandhuy

Objectives

- Easily be able to carry
- Fits within the claw's dimensions

Constraints

- Safe to utilize
- Must be able to carry up to 1 kilogram
- Cannot weigh larger than 350g
- Holds surgical tool in place without moving

Functions

- Firmly holds objects mid-air
- Can store solids and liquids without any leakage
- Transports objects to correct
- Allows steam to sanitize surgical tools

Team Number: Thurs-12

Name: Couper Smith	MacID: smitc25
Containers: *Objectives* • Made of material with high coefficient of friction (to prevent slipping) • Sturdy design (can survive drops and not spill contents) *Constraints* • Must NOT have a length or width greater than 150mm (proximal end limits of end-effector) • Size of the container must fit inside the autoclave (different dimensions depending on assigned scenario) • All features must be greater than 4mm (minimum dimension to be properly fabricated) • Must not exceed 350g *Functions* • Able to securely hold the surgical tool in place during transfer • Must allow sterilization to occur (ie steam must be able to penetrate the container)	**Robotic Arm/Autoclave Bins:** *Objectives* • Reliable (ie is able to ID the container and put it in the right location each time) • Require minimal human intervention Must allow sterilization to occur (ie steam must be able to penetrate the container) *Constraints* • Must provide enough force to move the container but not enough force to break the container *Functions* • Able to identify the type of container placed on the pick-up platform • Able to pick up the containers and securely move them to the correct container

MILESTONE 1 (STAGE 2) – LIST OF OBJECTIVES, CONSTRAINTS, AND FUNCTIONS

Team Number: Thurs-12

1. As a team, create a final a list of objectives, constraints, and functions in the table below.
   → Use your individual *Pre-Project Assignment* to build your team's final list
   → The exact number you should have depends on what information you have gathered from the Project Pack.

Objectives	Constraints	Functions
Made of material with high coefficient of friction (to prevent slipping)	Must not exceed 350g	Must allow sterilization to occur (ie steam must be able to penetrate the container)
Sturdy design (can survive drops and not spill contents)	Must NOT have a length or width greater than 150mm (proximal end limits of end-effector)	Securely hold the surgical tool in place during transfer
Easily able to be carried	All features must be greater than 4mm (minimum dimension to be properly fabricated)	Classify the surgical tools by colors and size
Holds tools securely	Size of the container must fit inside the autoclave (different dimensions depending on assigned scenario)	

2. What is the primary function of the entire system?

Allow Transport of Surgical Tools

3. What are the secondary functions?

Sterilizes Tools
Correctly Identifies Container and End Location
Securely hold the surgical devices in place

MILESTONE 1 (STAGE 3) – MORPHOLOGICAL ANALYSIS

Team Number: Thurs-12

1. Identify multiple means to perform the secondary functions that your team came up with during Stage 1 of this milestone. One sub-function (pick up) is already listed for you. The other two sub-functions are for your team to choose.
   → Make sure that every mean for the "pick-up" sub-function assumes that the end effector of the robot arm is a gripper. The means for your other sub-functions do not need to follow this assumption.

Function	**Means**					
Pick up	Grasp (from the sides)	Lift from bottom	Hoop on container	Suction Cups	Magnetic	Handle
Securely holds devices	Container	Indents in Container	High Friction Claw Material	Magnetic	Clips	Velcro
Correctly identifies end location	Camera	Coordinates system	Colour sensor	Depth sensor	Pre-Planned Code	

MILESTONE 1 (STAGE 4) – CONCEPT SKETCHES

Team Number: Thurs-12

Complete this worksheet *after* having completed stage 3 as a team ***and*** after having ***individually*** created your concept sketches.

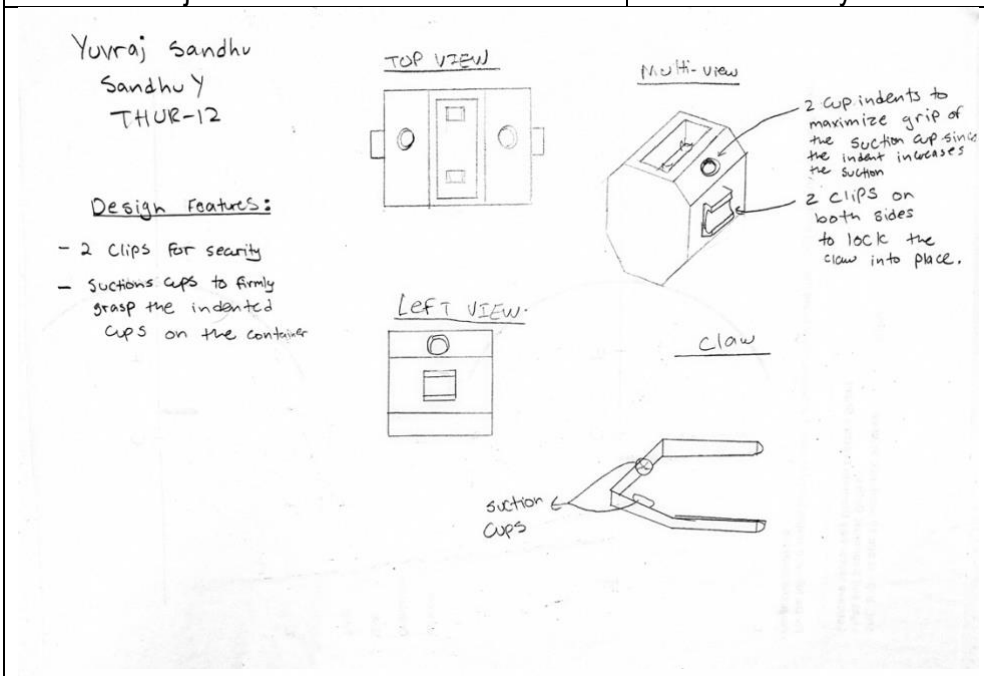
1. Each team member should copy-and-paste the photo of their individual concept sketches in the space indicated on the following pages
   → The photo's should be the same one your included in the **Milestone One Individual Worksheets** document
   → Be sure to include your **Team Number** on each page
   → Be sure each team member's **Name** and **MacID** are included with each sketch

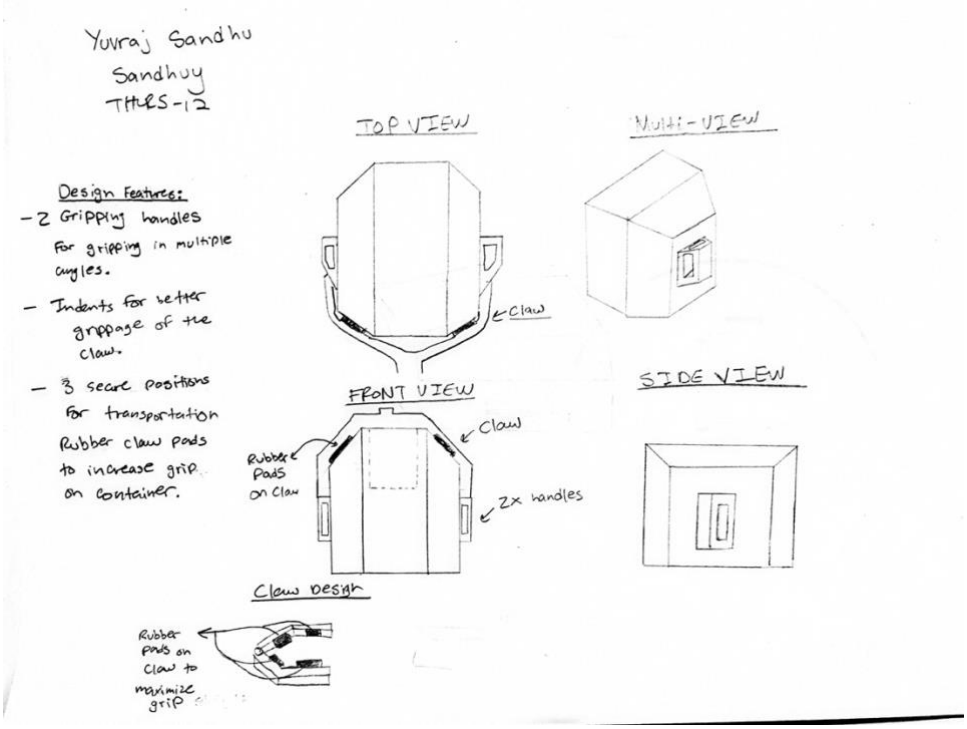
We are asking that you submit your work on both worksheets. It does seem redundant, but there are valid reasons for this:

- Each team member needs to submit their sketch with the **Milestone One Individual Worksheets** document so that it can be ***graded***
- Compiling your individual work into this **Milestone One Team Worksheets** document allows you to readily access your team member's work

Team Number: Thurs-12

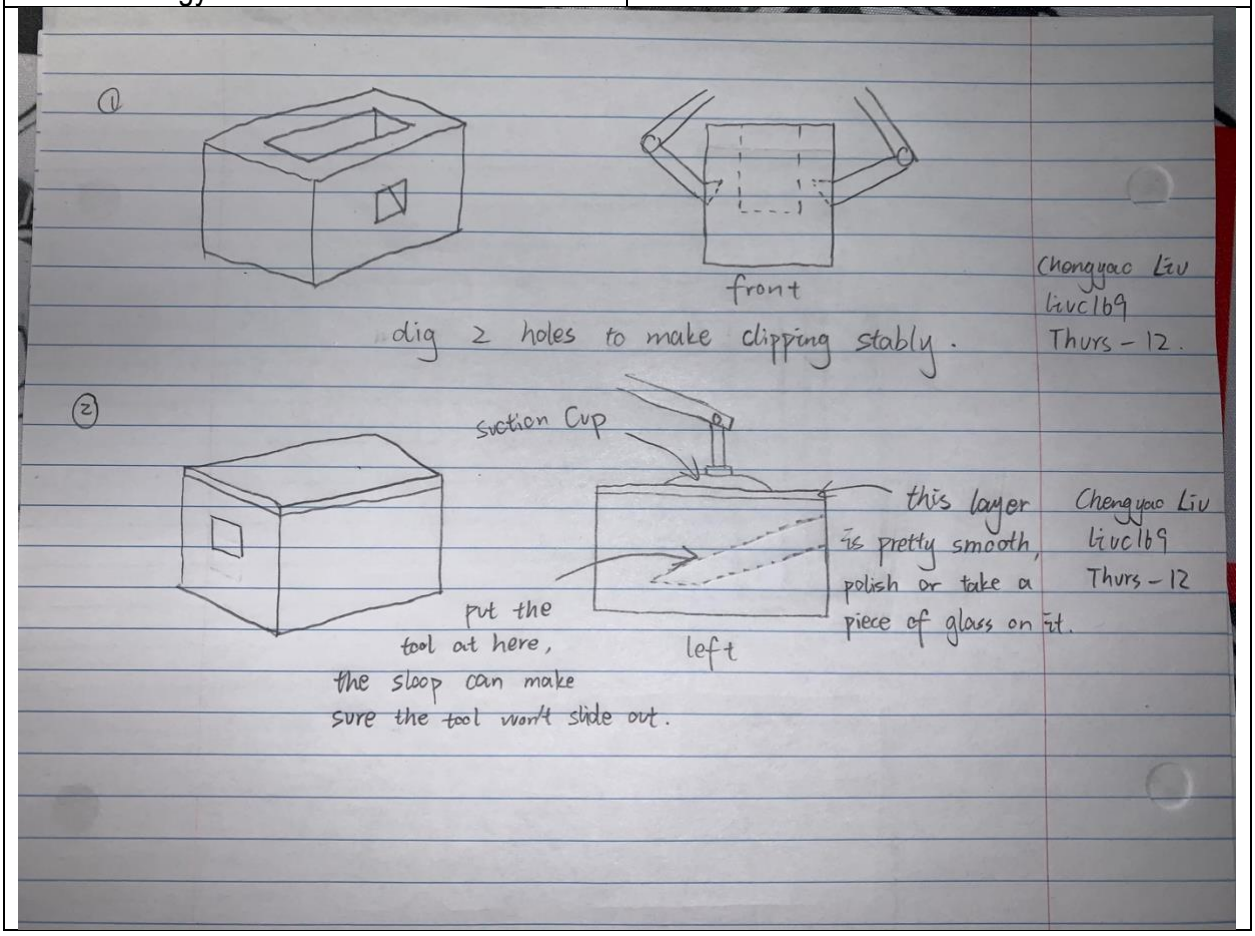
Name: Yuvraj Sandhu	MacID: Sandhuy





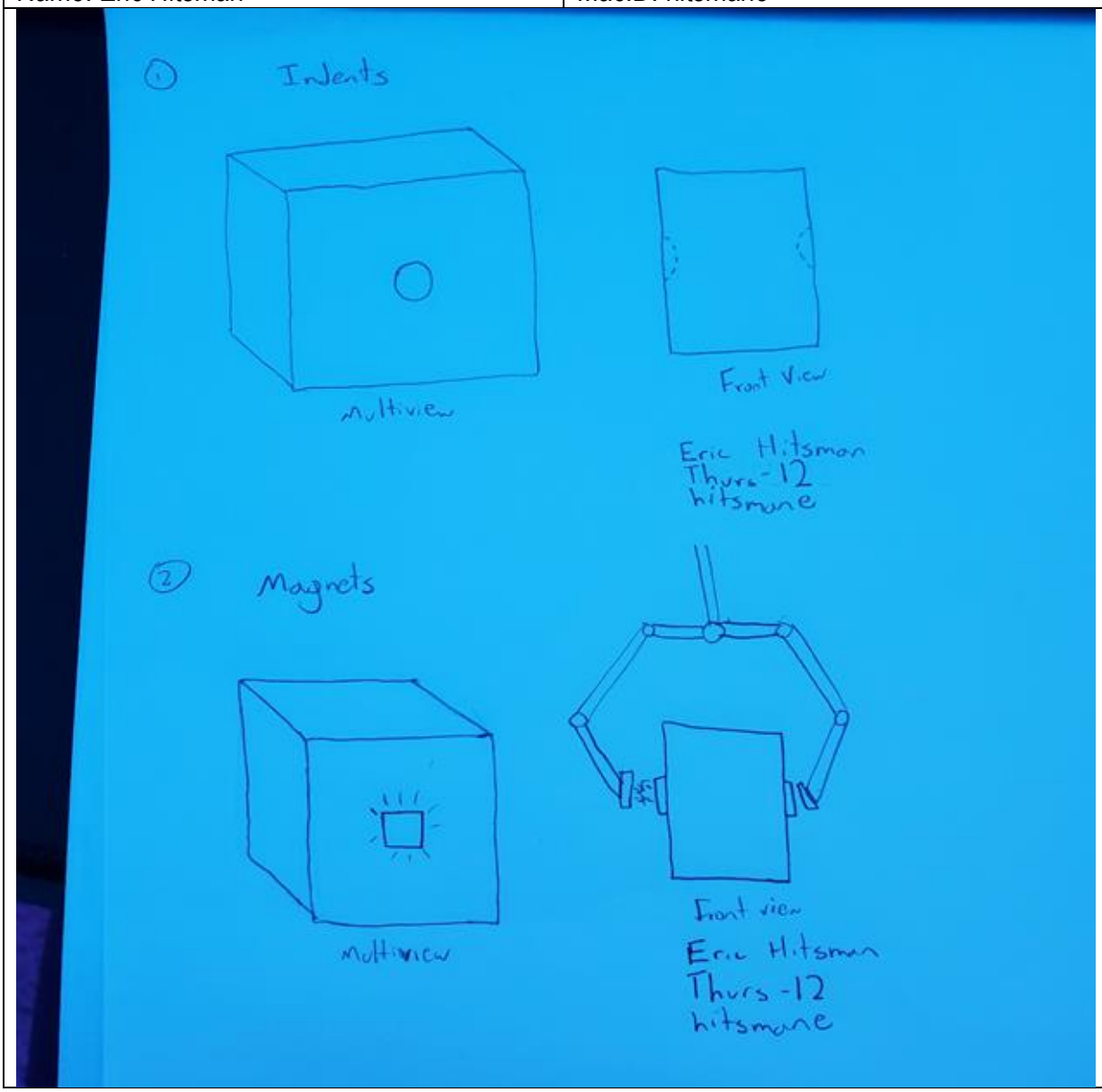
Team Number: Thurs-12

Name: Chengyao Liu	MacID: liuc169



Team Number: Thurs-12

Name: Eric Hitsman	MacID: hitsmane



Team Number: Thurs-12

Name: Couper Smith	MacID: smitc25