CENTER FOR MECHANICAL ENGINEERING STUDIES, UNIVERSITI TEKNOLOGI MARA, PULAU PINANG

Program	**:**	**Diploma in Mechanical Engineering**
Course	**:**	**Workshop Practice II**
Code	**:**	**MEM 261**

WORKSHOP PRACTICE II LABORATORY SHEET (FOUNDRY)

1.0 OBJECTIVE:

To demonstrate the principles mold making mould manual underlying the **sand casting** process.

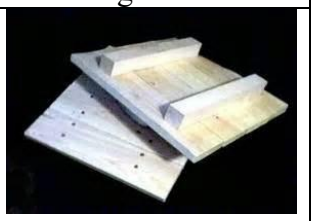
2.0 THEORY:

In any sand casting process, the moulding sand has to be prepared earlier and tested to ensure that the requisite properties are achieved. Then the procedure for making a typical sand mould can be carried out.

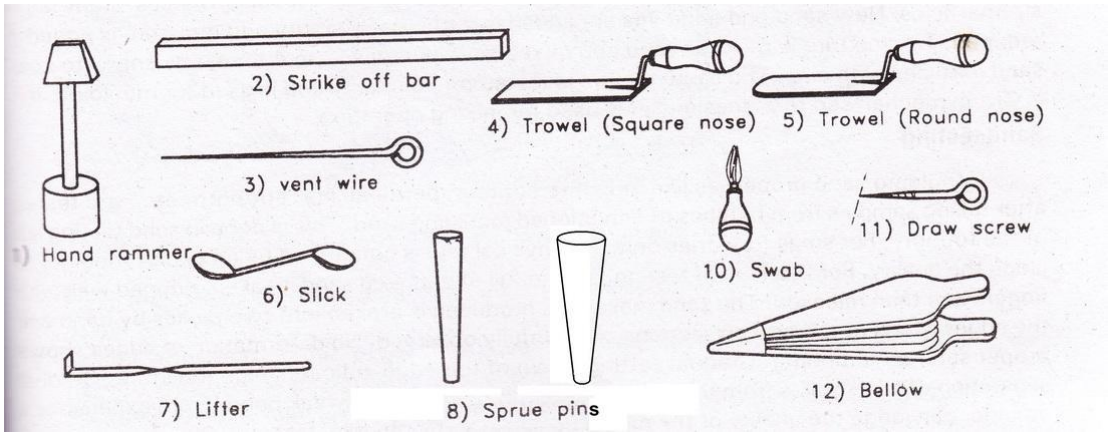
3.0 MATERIALS:

Silica sand	Coal dust	Water	Bentonite
			

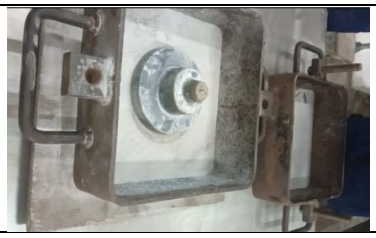
4.0 EQUIPMENT:

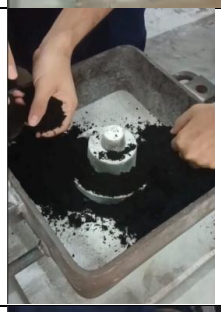
Flask	Pattern	Molding Plate	Moulding Box
			
Sand Muller	**Sand Separator**	**Moulding Flask**	
			

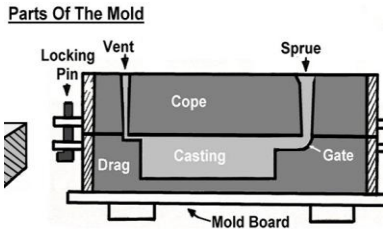
5.0 HAND TOOLS:



6.0 PROCEDURE:

No.	Figure	Explanation
1		Safety attire
		Select a pattern to be used. Place the pattern in the drag flask. Keep the drag facing upwards.

		Apply – Apply parting dust onto the pattern.
	 	Riddle sand over the pattern. Ram the sand in 3–4 layers until it is firmly packed.
		Level the sand using a scraper or strike-off bar.
		Carefully turn the drag over.
	 	Place – Place the cope on the drag. Insert the downgate and risers.

		Apply parting dust to the mould surface. Ram the sand firmly. Level and smooth the sand using a scraper or trowel.
		Remove the downgate and risers carefully. Lift the cope straight up and remove the pattern.
		Place the cope on the drag and secure both parts together. Assemble flask and match plate pattern
3		Then, assemble mold with cope and drag in place for the next process.
		Heat the metal in the furnace using a casting ladle. For this process, Wear suitable PPE. Pour the molten metal into the mould carefully and quickly. Allow the casting to cool and solidify. Remove the cope and take out the casting. Clean the casting and remove the sprue and runner. Inspect the casting for visible surface defects. Cut the casting through its thickest section using a band saw.

		Inspect the cut section for visible internal defects. Apply etching to the cut surface if required.

7.0 RESULT AND DISCUSSION:

Perform all the task as an individual and team work.
Students are required to document the working procedure by taking photos during the workshop session (work as an individual and team members).

a. Theoretical Background
   i. Briefly explains the Foundry process.

b. Describe material selection-material standards, selecting appropriate tools and sizes, performing machining operations, SOP and adhering to working procedures.

c. Present any measurement/ standard calculations/ measurement data/ result/ graph/ sketching, tolerance, or machining parameter etc.

d. Identifies and corrects any related issues.
   Required to analyses and discuss the welding process and techniques involved.

e. Snap, record and describe all the safety procedures, regulations, and personal protective equipment (PPE) relevant to each workshop activities.
   based on established standards and codes of practice.
   ISO standards or environmental regulations

f. Conclusion and recommendation

g. References
   State all the references that you have been used in order to complete this report.

For technical report:
Prepare the report according to the Technical Report & Rubric Requirements