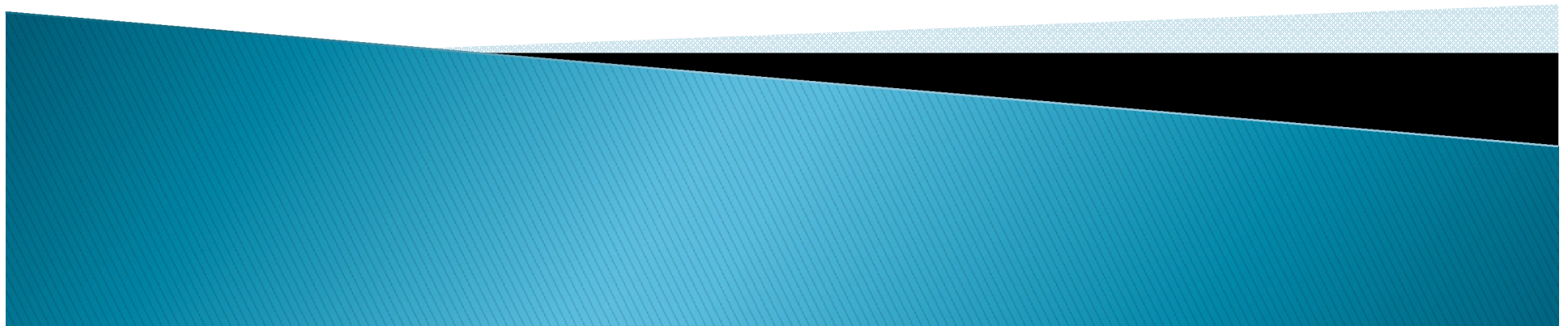# CHEMICAL SERVICES PRACTICE LEARNING

By:

Susila Kristianingrum

The benefits of learning practice models

- The knowledge learned through direct contact with the tool
- Individual freedom as the basic learning
- Anticipating a natural phenomenon
- Exercising using words and phrases for object
- Develop the intellectual and moral character of students
- Foster research
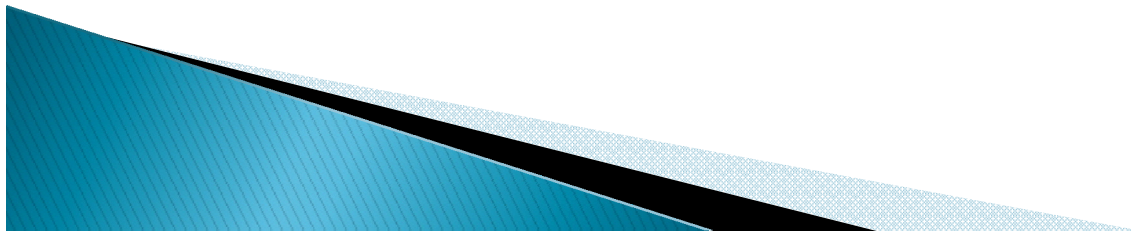
Basic skills that must be possessed by the laboratory personnel

- Managing lab, lab facility, chemicals, lab administration
- Projecting various purposes of lab
- Storage & maintenance equipment & chemicals
- Make adjustments to the curriculum
- Using a general workshop tools
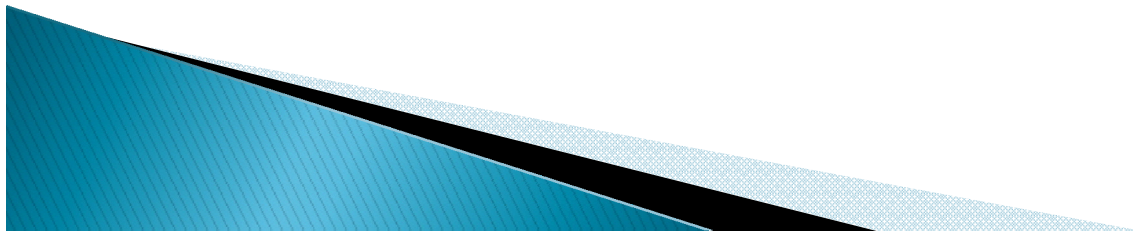
# Basic skills…………..

➢ Perform basic techniques

➢ Planning and organizing the use of lab for 1 year

➢ Organize distribution of tools & materials lab

➢ Prepare regulations & safety lab for students and lab personnel

Basic skills............

- Prepare clear instructions on how to use special equipment
- Determine the mobility of traffic flow in the practicum student with the benchmark number of students and lab conditions
- Completing P3K box and skilled do first aid in lab
- Task scheduling lab personnel
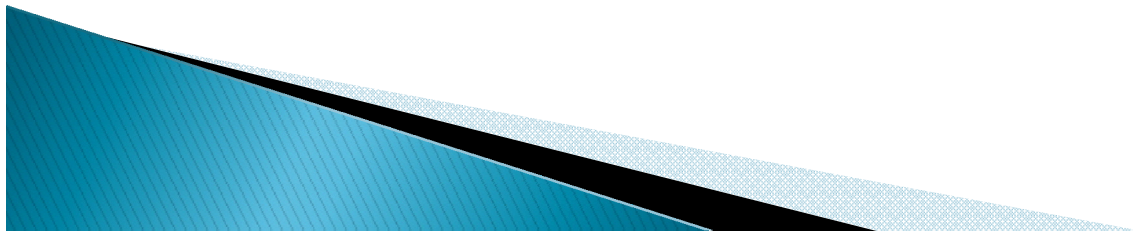
Aspects administered

- The room lab
- lab facility
- Tools and materials
- Workforce
- lab activities
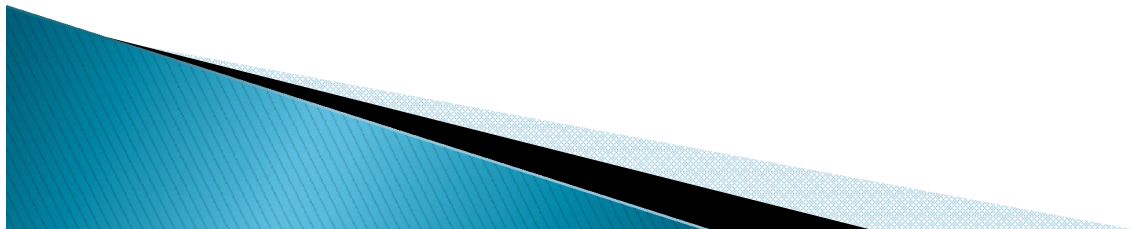
Format for lab administration

- Fomat A
- Format B1
- Format B2
- Format B3
- Format B4
- Format C1
- Format C2
- Format C3

- Data space lab cardstock
  List of items
  List of proposed items card tool
  List of tools
  Listing revenues / expenditures tool

Format for lab administration

- Format C4
- Format D1
- Format D2
- Format D3
- Format D4
- Format E
- Format F

- List of proposed equipment
- card substance
- List of substances
- List revenue / expenditure substances
- List of proposed substance
- data workforce
- Agenda lab activities

List of Mathematics Education (Directorate General of Higher Education)

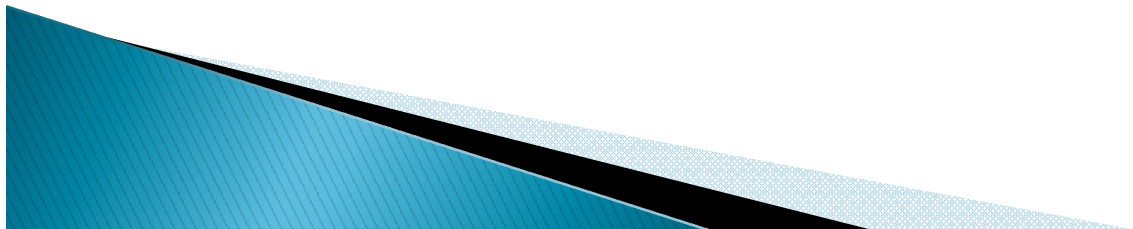|	
Room of weight	15 m^2
Room of Analysts	20 m^2
Room of assistant	20 m^2
Room of warehouse	20 m^2
Room of computer	20 m^2/10 people
Room of practicum	4 m^2/ people
Room of workshop	2,5 m^2/ people
Room of electronics	20 m^2/20 people
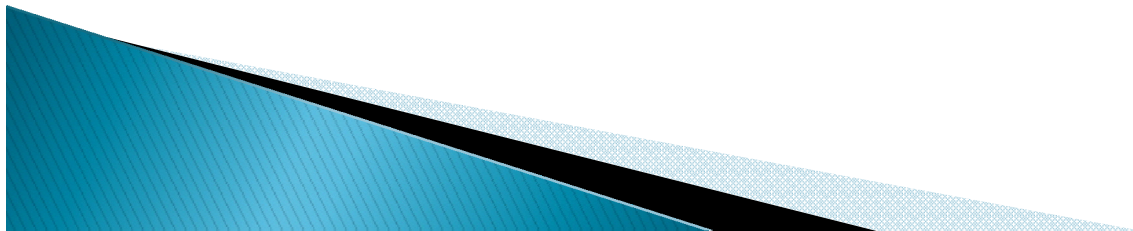
Sample Format A

Table 1. Data room Lab. chemical
Lab Name: Basic Chemistry

| Area (m^2)& lab capacity	Types of room	Fix area (m^2)	Area Should (m^2)	Details of the development
200	R. Practicum	130	160	
30	R. equipment	-	20	insulation space

Sample Tool Card:

▸ Name of equipment: measuring glass
▸ Group   : G
▸ Spesification   : 100 mL,od.2 cm
▸ Code No.   : 5 pyrex
▸ Location/RAL   : 1/2/3

Table 2. Card Tool

| Date	Condition						Information
	entry		exit		stock		
	good	broken	good	broken	good	broken	
1-2-2006	10	-	-	-	10	-	

Chemicals Card

- Name of chemical : Silver nitrat ($AgNO_3$)
- Group : A
- Spesification : 100 gram
- Code No. : 5 E Merck
- Location/RAL :1/2/3
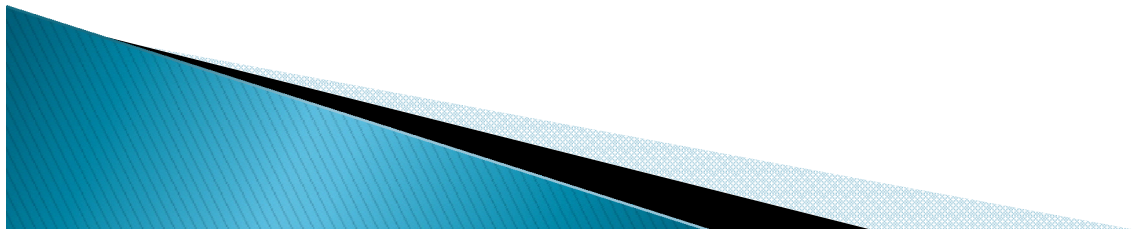
Preparation of copper sulphate [CuSO$_4$.5H$_2$O] 1 M

▸ Mr Cu=63,5; S=32; O=16; H=1
▸ Mr CuSO$_4$.5H2O= (1x63,5) + (1x32) + (4x16) + 5[(2x1) + (1x16)]= 249,5
▸ Mass of 1 mol CuSO4.5H2O= 249,5 g
▸ So to make a 1 M solution of copper sulphate is needed as much as 1 liter of 249.5 g CuSO4.5H2O and then dissolved in water to a volume of 1 liter solution.
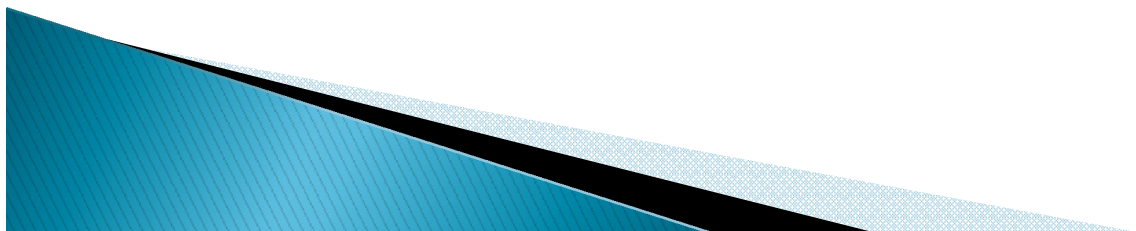
Preparation of 1 M HCl solution

▸ In concentrated HCl is usually unknown levels of 36%, density 1.18. Thus the mass of 1,000 mL of concentrated HCl is1.180 g.
In 1180 g of concentrated HCl, the amount of HCl = 36/100 x 1180 g = 424.8 g.
In 1 liter (1,000 mL) 1 M HCl solution contained 1 mol HCl.
The mass of 1 mol HCl = 36.5 g.
So to make a 1 M HCl solution required 36.5 g HCl, contained in concentrated HCl = 36.5 / 424.8 x 1,000 mL = 85.9 mL concentrated HCl.

CONTENT-BOX TOOL KITS

- Tape measure
- Glue/lem
- Epoxy/super glue
- Plastic cement
- Brush-teeth
- Drinking spook
- Terminal block (for joint the cable)
- Electric tape
- Screw driver/dual screw
- Hammer (besi/plastic)
- Mole trips pliers/Tang clamp
- key ring
- Yank/obeng getar/pump action screw driver
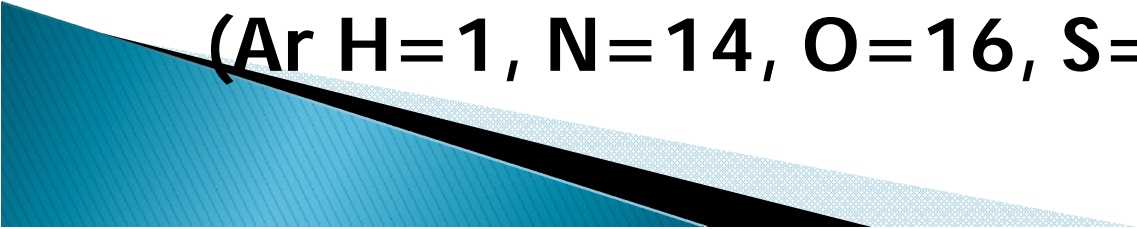- Stanley plier/pemotong kawat
- Cutter

CONTENT-BOX TOOL KITS

- ❖ Tanks of various sizes
- ❖ Needle fliers / miser
- ❖ Knife
- ❖ Multimeter
- ❖ Test-pen
- ❖ cotton yarn
- ❖ Cotton bud
- ❖ electric soldering
- ❖ Volt-meter
- ❖ Metal cutting saws (with silicon carbide cinpade)
- ❖ Sandpaper
- ❖ Fuse sizes
- ❖ etc.

TASK. DO THE FOLLOWING PROBLEMS!

1. In the Lab. available 16M HNO_3 solution (concentrated). How many mL of concentrated HNO_3 required to make as much as 100ml of 2M aqueous HNO_3?

2. In the Lab. available solution of 70% HNO_3, bj = 1.42 g / mL. How many mL of concentrated HNO_3 required to make as much as 100ml of 2M aqueous HNO_3?

(Ar H=1, N=14, O=16, S=32, Na=23)

DO THE FOLLOWING PROBLEMS!

3. In the Lab. available solution of 96% H_2SO_4, bj = 1.84 g / mL. How many mL of H_2SO_4 required to make dollars. 2M aqueous H_2SO_4 as 250 ml?

4. How many grams of NaOH are required to make NaOH solution: a) 0.1 M b) 0.5 M c) 2M?

(Ar H=1, N=14, O=16, S=32, Na=23)