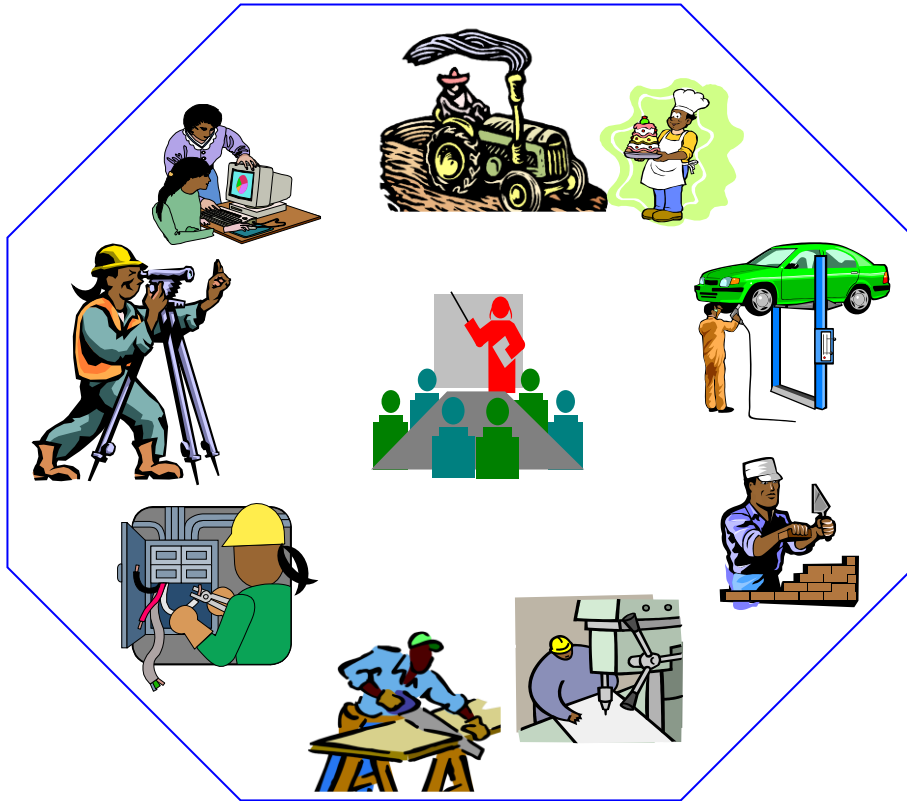


# BIOMEDICAL EQUIPMENT SERVICING MANAGEMENT

## Level-IV

Based on May, 2011 Version 2 OS and Feb, 2021 Version 1 Curriculum



**Module Title: - Managing Performing Technical Consultation**

**LG Code: EEL BES4 M04 LO (1-5) LG (14-14)**

**TTLM Code: EEL BES4 M03\_TTLM 0221**

**February 2021  
Bishoftu, Ethiopia**



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<b>LG #14</b>	<b>LO1: Conduct inspection.</b>
<b>Instruction Sheet</b>	

This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics:

- Plan and preparing management of servicing and maintenance of OHS policies and procedures
- Consulting and directing appropriate personnel.
- Checking programs to be managed for servicing and maintenance.
- Identifying materials necessary to complete the work.
- Identifying tools, equipment and testing devices.
- Formulating procurement management plan.

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, Upon completion of this Learning Guide, you will be able to:

- Plan and prepare management of servicing and maintenance of OHS policies and procedures
- Consulting and direct appropriate personnel.
- Check programs to be managed for servicing and maintenance.
- Identify materials necessary to complete the work.
- Identify tools, equipment and testing devices.
- Formulate procurement management plan.

### **Learning Instructions:**

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described below 3 to 4.
3. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.
4. Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” in page -5, 10, 13 and 17 respectively.



## Information Sheet 1 - Inspecting and addressing industry technical problems.

### 1.1. Inspections

Inspections: an indispensable tool of modern manufacturing Whether we like it or not, inspections remain an indispensable tool of modern manufacturing to prevent equipment failures, process deviations, and quality defects. Performed properly, they directly support both top line and bottom line, by helping to maintain the condition and reliability of facilities and equipment, ensuring product quality, reducing the waste of downtime, scrap and rework -even driving continuous improvement.

#### 1.1.1. Analyze the problems.

Every problem is unique, this is true, but problem-solving doesn't have to be a guessing game. Effective business problem solving is something that can be mastered by following a simple, methodical approach.

**At Analyze, we have a proven 5 Key steps to problem analysis:**

#### I. Understand the problem

We've seen many examples where businesses have jumped straight into solution mode without any success. It boils down to one key consideration: If you can't explain what the problem is, you can't begin to solve it. Let's take a practical example: Sales figures are unusually low. Some questions you may want to kick off with include: How long has this been a problem? How was the problem identified? Who are the key players? And what are the downstream impacts?

#### II. Define the root cause

You've probably heard the saying: "treat the problem, not the symptom". Doctors like to use that line a lot, but it's actually very solid advice. Once you've identified the problem and you understand its symptoms, take a few steps back to identify the root cause. If we take our example from step 1, you'll find that the root cause for low sales figures could be anything from competitor behavior, to team morale/low incentive, or even technology factors which are hindering the sales process.

#### III. Identify possible solutions

Don't settle for the first solution that's identified. The more solutions you consider, the better your chances of finding the right fit. We believe that business solutions must always consider



the people, process and technology aspects of solving the problem. It is seldom that technology alone can solve a business problem. Brainstorming is a powerful technique for generating ideas as it provides a platform for your team to apply their specific skills and knowledge to the problem. It's important, however, to try and include people with different functional expertise and from different levels within the business to ensure that you're tackling the problem from all possible angles.

#### **IV. Implement the solution that gives you the most “bang for your buck”**

It's tempting to go for the cheapest or quickest option, but that doesn't always mean it's the best one for your business. On the flipside, it's also important not to overcomplicate things. Weigh up the pros and cons of each option identified during your brainstorming session, then rank them according to how well it addresses the root cause. Discuss and agree on the best option and ensure that you get complete buy-in from all relevant parties.

#### **V. Define success & monitor results**

You need to be clear about how you'll identify whether the problem has been resolved. Then monitor results on an ongoing basis to ensure that you're on track. If at any time you realize that your chosen solution has resulted in unexpected issues, or is not meeting your desired results, stop work immediately and go back to the drawing board.

**In summary:** Take enough time to properly evaluate a problem before taking any action. Careful consideration is the key to avoiding unnecessary spend and ensuring better results. Evaluation plan.

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**Self-Check 1 - Written Test**

*Directions:* Answer all the questions listed below. Use the Answer sheet provided in the next page:

- 1. What is Maintenance management? (2 point)
- 2. What is PPE? (2 point)

**Note: Satisfactory rating – 4 points**

**Unsatisfactory - below 4 points**

Score = _____
Rating: _____

**Answer Sheet**

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. \_\_\_\_\_  
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2. \_\_\_\_\_  
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\_\_\_\_\_



## Information Sheet 2 - Developing and implementing Consultation processes.

### 2.1. Consulting

Consultation is a two-way process between you and your workers where you:

- talk to each other about health and safety matters
- listen to their concerns and raise your concerns
- seek and share views and information, and
- consider what your workers say before you make decisions.

#### Consultation requires that:

- relevant work health and safety information is shared with workers
- workers are given a reasonable opportunity to express their views and to raise health or safety issues
- workers are given a reasonable opportunity to contribute to the decision-making process relating to the health and safety matter
- the views of workers are taken into account, and
- workers are advised of the outcome of any consultation in a timely manner.

Management commitment and open communication between managers and workers is important in achieving effective consultation. Your workers are more likely to engage in consultation when their knowledge and ideas are actively sought and any concerns about health and safety are taken seriously.

Consultation does not mean telling your workers about a health and safety decision or action after it has been taken. Workers should be encouraged to:

- ask questions about health and safety
- raise concerns and report problems
- make safety recommendations
- be part of the problem solving process.

While consultation may not result in agreement, this should be the objective as it will make it more likely that the decisions are effective and will be actively supported.

#### Barriers to Effective Group Decisions/Consultation

- Lack of group maturity
- Conflicting goals of members
- Failure to communicate – listen
- Ego of group members
- Conflict avoidance
- Power differences
- Distrust
- Lack of commitment
- Insufficient time
- Inappropriate group size
- Foregone conclusion





**Self-Check 2 - Written Test**

**Direction:** Write/List down the following. Use the answer sheet for your answer

1. What is Consulting? — (3 point)
2. What is Directing? — (3 point)
3. List down 4(four) Different Elements of Directing. (4 point)

**Note: Satisfactory rating – 10 points**

**Unsatisfactory - below 10 points**

Score = _____
Rating: _____

**Answer Sheet**

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. \_\_\_\_\_  
\_\_\_\_\_  
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2. \_\_\_\_\_  
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3. \_\_\_\_\_  
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## Information Sheet 3 - Developing evaluation and work plans.

### 3.1. Work Plan

A work plan is essentially a project management plan by another name. When done properly, your work plan will clearly articulate and outline the steps needed to achieve a department-level or company-level end goal by baking in milestones, deliverables, resources, budgetary requirements and a timeline to weave it all together.

It's usually best suited for large projects and initiatives, but can really be used on any level. Before beginning your work plan, consider using SMART goals: create goals that are Specific, Measurable, Achievable, Relevant and Time-related. This should help you start your plan off on the right foot.

#### How to Make a Work Plan

Creating a work plan is a very involved process and requires as many established details as possible before you present to stakeholders. Here's what you'll need to focus on.

#### 1. Identify the Project Name, Purpose and General Timeline

By doing this you can tell your project approvers that your project will take one quarter, six months or one year given the purpose of the project, as well as the rest of the information you will fill in after this step.

You should also tell your project approver the purpose of your project. Will your project be to better meet customer needs? Maybe your competitor released an upgraded version of a product you have, and you need to scale up to meet market demands. Whatever the ultimate purpose is, make sure that it's stated right off the bat.

#### 2. Put Your Work Plan into Context

Write an introduction and background to better outline why you need this project to happen and what made you consider trying to meet that ultimate goal in the first place. Creating context and establishing the problem helps explain why you need the solution.

#### 3. Establish Your Goals and Objectives

Your goals might sound like your purpose, but they're a little more specific in that they're more long-term oriented — i.e., your team learned more about the process of launching a bug fix or how to respond more directly to customer/market feedback.

Similarly, your project objectives should be measurable. For example, the objective of this project after launch is to create an increase of xx% of active monthly subscribers, or a certain dollar amount in revenue generated.

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It's best to use your SMART goals here. Build out what is specific, what is measurable, what is achievable, what is relevant and what can be done within the project time frame.

#### **4. Define and Coordinate Your Resources**

When you define and coordinate your resources, be sure to address the following questions:

How much of the budget will go towards this project?

From what department will the budget be allocated?

Which software tools (like time tracking, project management tools) will be required to streamline the project?

#### **5. Understand Your Constraints**

And especially consider the triple constraint of time, budget and resources. Because at this point, you've already listed out all three in previous steps, you can now factor in risks that might hamper those processes.

Maybe your staff takes a few sick days during this period of time; maybe one of your key department liaisons has to tend to a family emergency; maybe some of your tools crash that require more money pulled from the budget. Whatever your constraints may be, factor in anything that might feel like a risk that can lead to a full-blown constraint.

#### **6. Discuss Risks and Accountability**

Risks need to be assessed from as many corners as possible. Consider paid time off, vacation time that staff has accrued, and company holidays. Consider any freak accidents that might affect your budget or timeline directly. And then appoint someone to take charge in case the environment becomes favorable for those risks to become reality. Create a sense of accountability so that all team members can have an active stake in the successful outcome of the project and to minimize the possibility of error.

Cover not just the basics, but every detail in your work plan with a fine-toothed comb. With every potential question or red flag already covered, you'll be able to get sign off from stakeholders and start your project with the right expectations in mind.

### **3.2. Evaluation plan**

There are two types of evaluation typically requested by funders--formative and summative—and which you use is largely dictated by the purpose of the evaluation. Do you want to prove that you achieved the outcomes as intended (summative) or are you doing evaluation to monitor if you are doing what you said you would in your grant application (formative)? Or both? We can help you prepare and review both types of evaluations outlined below.

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**Formative or Process Evaluation does the following:**

- Assesses initial and ongoing project activities
- Begins during project development and continues through implementation
- Provides new and sometimes unanticipated insights into improving the outcomes of the project
- Involves review by the principal investigator, the steering or governance committee, and either an internal or external evaluator (depending on grant requirements)

**Summative or Outcomes Evaluation does the following:**

- Assesses the quality and success of a project in reaching stated goals
- Presents the information collected for project activities and outcomes
- Takes place after the completion of the project
- Involves review by the principal investigator, the steering or governance committee, either an internal or external evaluator, and the program director of the funding agency
- All evaluation plans should identify both participants (those directly involved in the project) and stakeholders (those otherwise invested by credibility, control or other capital), and should include the relevant items developed in the evaluation process.

(Writing an Evaluation Plan | Research at Brown | Brown University n.d.)



**Self-Check 3 -- Written Test**

**Direction:** Write/List down the following. Use the answer sheet for your answer.

- 1. What is Maintenance program? (2 point)
- 2. Write the preventive maintenance checklists? (2 point)
- 3. Write down the Maintenance program responsibilities include? (2 point for each)

**Note: Satisfactory rating – 10 points**

**Unsatisfactory - below 10 points**

Score = _____
Rating: _____

**Answer Sheet**

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. \_\_\_\_\_  
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2. \_\_\_\_\_  
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3. \_\_\_\_\_  
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<b>LG #15</b>	<b>LO2: Evaluate technical problems.</b>
<b>Instruction Sheet</b>	

This learning guide is developed to provide you the necessary information regarding the following ~~content coverage~~ and topics:

- ~~Establishing inventory system.~~
- ~~Using labels/tags.~~
- ~~Conducting equipment inventory regularly.~~
- ~~Completing and submit inventory records and reports properly.~~
- ~~Categorizing and file manuals in an accessible manner.~~
- ~~Establishing data base system.~~

This guide will also assist you to attain the learning outcome stated in the cover page. Specifically, upon completion of this Learning Guide, you will be able to:

- ~~Establish inventory system.~~
- ~~Use labels/tags.~~
- ~~Conduct equipment inventory regularly.~~
- ~~Complete and submit inventory records and reports properly.~~
- ~~Categorize and file manuals in an accessible manner.~~
- ~~Establish data base system.~~

**Learning Instructions:**

5. ~~Read the specific objectives of this Learning Guide.~~
6. ~~Follow the instructions described below 3 to 4.~~
7. ~~Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.~~
8. ~~Accomplish the “Self-check 1, Self-check t 2, Self-check 3 and Self-check 4” in page -5, 10, 13 and 17 respectively.~~



## Information Sheet 1 - Identifying, evaluating and creating systematic solution for Technical problems.

### 1.2. Technical problems.

Technical Difficulties are unforeseen equipment problems such as hardware failures or software bugs that make it difficult or impossible to perform a desired action.

There are two important things to remember about problems and conflicts: they happen all the time and they are opportunities to improve the system and the relationships. They are actually providing us with information that we can use to fix what needs fixing and do a better job. Looked at in this way, we can almost begin to welcome problems! (Well, almost.)

(Seven Steps for Effective Problem Solving in the Workplace n.d.)

**Here are seven-steps for an effective problem-solving process.**

#### 1. Identify the issues.

- Be clear about what the problem is.
- Remember that different people might have different views of what the issues are.
- Separate the listing of issues from the identification of interests (that's the next step!).

#### 2. Understand everyone's interests.

- This is a critical step that is usually missing.
- Interests are the needs that you want satisfied by any given solution. We often ignore our true interests as we become attached to one particular solution.
- The best solution is the one that satisfies everyone's interests.
- This is the time for active listening. Put down your differences for awhile and listen to each other with the intention to understand.
- Separate the naming of interests from the listing of solutions.

#### 3. List the possible solutions (options)

- This is the time to do some brainstorming. There may be lots of room for creativity.
- Separate the listing of options from the evaluation of the options.

#### 4. Evaluate the options.

- What are the pluses and minuses? Honestly!
- Separate the evaluation of options from the selection of options.

#### 5. Select an option or options.

- What's the best option, in the balance?



- Is there a way to "bundle" a number of options together for a more satisfactory solution?

#### **6. Document the agreement(s).**

- Don't rely on memory.
- Writing it down will help you think through all the details and implications.

#### **7. Agree on contingencies, monitoring, and evaluation.**

- Conditions may change. Make contingency agreements about foreseeable future circumstances (If-then!).
- How will you monitor compliance and follow-through?
- Create opportunities to evaluate the agreements and their implementation. ("Let's try it this way for three months and then look at it.")

Effective problem solving does take some time and attention more of the latter than the former. But less time and attention than is required by a problem not well solved. What it really takes is a willingness to slow down. A problem is like a curve in the road. Take it right and you'll find yourself in good shape for the straightaway that follows. Take it too fast and you may not be in as good shape.





### Self-Check 1 – Multiple choice

*Directions:* choose the best answer from then following equation. Use the answer sheet for your answer.

1. ~~\_\_\_\_\_ well designed location names and clearly label all locations where items may be stored.~~  
A. ~~Keep~~                      B. ~~Create~~                      C. ~~Make~~                      D. ~~Use~~
2. ~~Use well organized, consistent, and unique descriptions of your items, starting with nouns.~~  
A. ~~Keep~~                      B. ~~Create~~                      C. ~~Make~~                      D. ~~Use~~
3. ~~Keep item identifiers (e.g. part numbers) shortly, consistently formatted, unique, and avoid common pitfalls.~~  
A. ~~Keep~~                      B. ~~Create~~                      C. ~~Make~~                      D. ~~Use~~
4. ~~Make sure you have a good starting count of all your items, their locations, and any other relevant inventory data~~  
A. ~~Keep~~                      B. ~~Create~~                      C. ~~Make~~                      D. ~~Use~~
5. ~~Use an inventory tracking software like Clearly Inventory. Spreadsheets or written lists do not work well in the long term.~~  
A. ~~Keep~~                      B. ~~Create~~                      C. ~~Make~~                      D. ~~Use~~
6. ~~Create solid inventory management policies and train your people to follow them~~  
A. ~~Keep~~                      B. ~~Create~~                      C. ~~Make~~                      D. ~~Use~~

**Note: Satisfactory rating – 7 points**

**Unsatisfactory - below 7 points**

Score = \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

Rating: \_\_\_\_\_

#### Answer Sheet

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

4. \_\_\_\_\_ 5. \_\_\_\_\_ 6. \_\_\_\_\_ 7. \_\_\_\_\_



## Information Sheet 2 - Allocating require resources.

### “Resource allocation is the process of assigning assets in a manner that supports your team’s goals”

In practice, it means having what you need to get the job done on time. Resources come in many different shapes. Here are some common examples:

- **People:** Team members, often with different skill sets, who contribute to the project.
- **Equipment/Tools:** Anything from computer software to a chainsaw, depending on the organization.
- **Facilities:** The environment needed to do work, most commonly office/meeting room space.
- **Materials:** Consumables to create your outputs. Think paper, pens, or even fuel for travel.
- **Budget:** The actual cash you’ll need to purchase any of the above resources.

Our focus in this article is on managing people resources. But the same concepts apply when managing other types of resources.

#### 2.1. 4 Tips For Effective Resource Allocation

##### I. Know your resources and their capabilities

When planning your project, you should understand the capability of your team and the quality of resources you have at your disposal. For example, if your project involves designing a very complex website, you may have to assign your top web developers to it.

That’s why, for efficient allocation, project managers need to know their resources as well as chefs know their Michelin-star dishes!

##### II. Expect scope changes and have a backup plan.

Similarly, most projects don’t always go perfectly according to the original plan. For example, let’s say your team is working on a web development project and suddenly, the client wants an additional feature added. To handle such changes, project managers should always have a backup resource allocation plan for the project.



### III. Never over allocate resources

Sure, underutilization of resources can be bad for business since you're not using your resources to their full capacity. However, overutilization of any project resource can be just as bad.

Remember, you can't add one cup of flour to the cake when you only need half a cup!

Overusing resources could result in:

Early resource burnout due to excessive usage

Lowering the overall effectiveness of the resource itself

Reducing the usefulness of the other resources

Unfortunately, overutilization is more common than you think because managers always want to add whatever they can to ensure that everything proceeds smoothly.

Don't do that.

Use a good resource utilization plan for optimal allocation of resources to ensure that you always have just what you need.

~~This applies to your projects too.~~ Perform an in-depth analysis of your projects after it's complete to analyze various factors like:

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Utilization rate

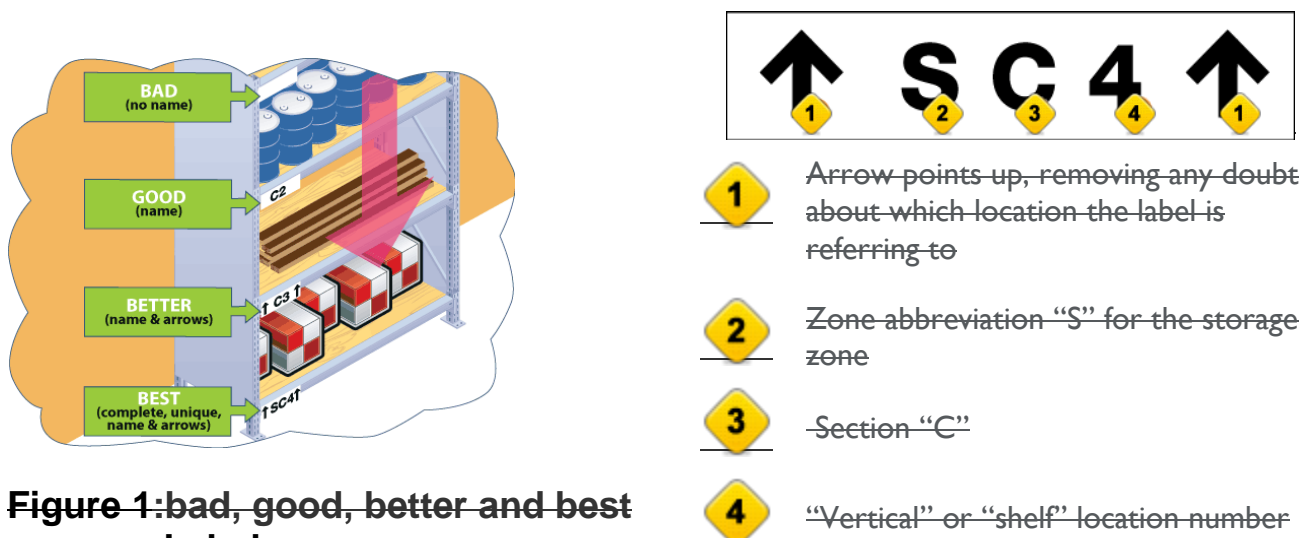
Resource allocation

Whether you were able to meet deadlines or not

Determine what went well in the project and what didn't. Then use this information to improve your resource allocation strategy for future projects.

## 2.2. Tips on Applying Labels:

- Before you apply your label, make sure that the surface is clean. If you have any doubts about whether or not the label will stick over the long term, cover the label with clear packing tape.
- If you are trying to apply a label to a wire rack, use the duct tape on one side of the wire so that the sticky side of the label and the sticky side of the tape will stick together with the wires in between.
- If your label maker can't print arrows, or it's too difficult, print a sheet of arrows using a word processor and then cut and tape the arrows on either side of your labels.
- If you're applying a lot of labels, use the roller we describe under "Labeling Supplies" above. It's great for firmly pressing labels and getting rid of air bubbles. If you do this with your fingers, they will get sore, and chances are that you'll go through more than a few labels when you try to smooth them out and deform them by mistake.



**Figure 1: bad, good, better and best Labels**

### Self-Check 2 – Matching

Directions: Match from column A to B

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\_\_\_\_\_ A

1. **C**  
3

2. **S**  
2

3. **4**  
4

4. **↑**  
1

B

A. \_\_\_\_\_ points up, removing any doubt about which location the label is referring to

B. Zone abbreviation “\_\_\_\_\_” for the storage zone

C. Section “\_\_\_\_\_”

D. “Vertical” or “shelf” location number

**Note: Satisfactory rating – 4 points**

**Unsatisfactory - below 4 points**

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

### Answer Sheet

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

4. \_\_\_\_\_



<b>LG #16</b>	<b>LO3: Prepare technical recommendation.</b>
<b>Instruction Sheet</b>	

This learning guide is developed to provide you the necessary information regarding the following content coverage and topics:

- ~~Ascertaining and detail normal function of biomedical equipment.~~
- ~~Using mechanisms to measure and record report progress of activities.~~
- ~~Managing and monitoring servicing and maintenance system.~~
- ~~Respond to unplanned events or conditions.~~
- ~~Maintaining records and making documentation of servicing and maintenance activities.~~
- ~~Monitoring results of routine maintenance activities.~~
- ~~Acting shortfalls in quality outcomes.~~

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, you will be able to:

- ~~Ascertain and detail normal function of biomedical equipment.~~
- ~~Use mechanisms to measure and record report progress of activities.~~
- ~~Manage and monitoring servicing and maintenance system.~~
- ~~Respond to unplanned events or conditions.~~
- ~~Maintain records and making documentation of servicing and maintenance activities.~~
- ~~Monitor results of routine maintenance activities.~~
- ~~Act shortfalls in quality outcomes.~~

#### **Learning Instructions:**

**9. Read the specific objectives of this Learning Guide.**

**10. Follow the instructions described below 3 to 4.**

**11. Read the information written in the information “Sheet 1, Sheet 2, Sheet 3 and Sheet 4”.**

**12. Accomplish the “Self-check 1, Self-check 2, Self-check 3 and Self-check 4” in page 5, 10, 13 and 17 respectively.**



## Information Sheet 1 – **Establishing inventory system.**

### **2.2. Inventory System**

A correct inventory of medical equipment is the first and most critical step in implementing management processes for monitoring and control of medical equipment. Inventory management is an attempt to have the right stock, in the right place, at the right time, and at the right cost. The goal is to minimize cost by helping facilities know when to purchase more inventory based on normal usage rates.

The way you define inventory depends on your industry. For a retail store, inventory is the products the store is trying to sell customers, like suits or dresses. When it comes to maintenance, inventory is the parts used to make assets function properly, like motors, bearings, fans or filters. The aim for maintenance teams is to have the right inventory on hand in the right amounts to repair or improve assets, while also considering the space available in their budgets and storerooms. (What is Maintenance Inventory Management? | Fix n.d.)

### **2.3. The following are the key elements to a well-organized inventory tracking system.**

- Create well designed location names and clearly label all locations where items may be stored.
- Use well organized, consistent, and unique descriptions of your items, starting with nouns.
- Keep item identifiers (e.g. part numbers) shortly, consistently formatted, unique, and avoid common pitfalls.
- Decide if you will need to use units of measure, and if so, make sure they are formatted consistently and used properly.
- Make sure you have a good starting count of all your items, their locations, and any other relevant inventory data
- Use an inventory tracking software like Clearly Inventory. Spreadsheets or written lists do not work well in the long term.
- Create solid inventory management policies and train your people to follow them.



**Self-Check 1 - Written Test**

*Directions:* Answer all the questions listed below. Use the Answer sheet provided in the next page:

- 3. What is Maintenance management?
- 4. What is Maintenance planning?
- 5. Write some types of PPE?

**Note:** Satisfactory rating – 6 points

Unsatisfactory - below 3 points

**Answer Sheet**

Score = _____
Rating: _____

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

3. \_\_\_\_\_  
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<b>Information Sheet 2</b> <del>Using mechanisms to measure and record report progress of activities.</del>
---

### **2.3. Progress of activities**

One of the most important aspects of a Manage/monitor job is measuring progress on each task. It helps employees stay focused and meets goals, and it helps maintenance managers stay on top of what's happening in the workplace. The first step of effective leadership is helping others stay on task, keeping team members engaged and holding everyone accountable. Here are just a few effective ways of tracking activities progress as a manager.

#### **2.3.1. Create a activities Outline**

Working with team members to create a activities outline can be a great way of tracking activities progress. Each member of the team can give input for setting up realistic goals and learn what's expected of them individually and as part of a group. Taking the time to sit down with workers and hash out a comprehensive outline—including team goals, milestones, and key activities indicators (KAIs) is a great first step.

#### **2.3.2. Establish Goals.**

When considering how to track the progress of a task, it's good to consider a worker's specific skill set first. Measuring progress can look very different from person to person and task to task. The more familiar a manager is with each employee's skills and limitations, the better sense he or she will have of how to hold them accountable. Setting up tailored goals and milestones with each member of the team also goes a long way toward team satisfaction. It's important to stress each team member's role and how it will contribute to the success of the team as a whole. Keeping the big picture in mind is always important, even while implementing smaller goals and points of progress.

#### **2.3.3. Check in Regularly**

When considering how to track the progress of a task, never underestimate the importance of checking in. Having a quick, informal chat at the beginning of each work session can establish trust between managers and workers, and help to distinguish a key difference between workers feeling cared about and checked in on versus feeling judged or checked up on. Communication is always key in making sure a activity runs smoothly. If a worker is having trouble reaching goals or performing time-sensitive tasks, it's best to check in and try to get to learn the reason why, rather than continuing to implement structures that aren't motivational or helpful.



#### **2.3.4. Ask How You Can Help**

There are many ways a manager can help workers feel less stressed or overwhelmed by tasks. For example, suggesting tools that are available to help workers with their organization skills is always a great option. Project/task management software can be a great way to show individual workers how to track the progress of a project and work collaboratively without getting caught up in a lot of confusing details.

#### **2.3.5. Establish Clear Deadlines**

Keeping the end goal in sight is always helpful for measuring progress. Being clear about deadlines can help workers stay on track and complete tasks without getting overly stressed or overwhelmed. Tracking activity progress becomes far easier once everyone knows what the tasks timeline is. Some managers prefer to work with one final deadline, while others like to establish a deadline per milestone or goal. Whatever the preferred method, so long as each deadline is clearly set and team members have a sense of what they're working towards, keeping track of each task should be a simple matter of sticking to the schedule.



## Self-Check 2 - list

**Direction :** Write/List down the following. Use the answer sheet for your answer.

1. Write/List down effective ways of tracking activities progress as a manager?

**Note: Satisfactory rating – 5 points**

**Unsatisfactory - below 5 points**

Score = \_\_\_\_\_

Rating: \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

### Answer Sheet

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_



### **3.3. Servicing and maintenance system.**

System maintenance is an ongoing activity, which covers a wide variety of activities, including removing program and design errors, updating documentation and test data and updating user support. For the purpose of convenience, maintenance may be categorized into three classes, namely:

- **Corrective Maintenance:** This type of maintenance implies removing errors in a program, which might have crept in the system due to faulty design or wrong assumptions. Thus, in corrective maintenance, processing or performance failures are repaired.
- **Adaptive Maintenance:** In adaptive maintenance, program functions are changed to enable the information system to satisfy the information needs of the user. This type of maintenance may become necessary because of organizational changes which may include:
  - ✓ Change in the organizational procedures,
  - ✓ Change in organizational objectives, goals, policies, etc.
  - ✓ Change in forms,
  - ✓ Change in information needs of managers.
  - ✓ Change in system controls and security needs, etc..
- **Perfective Maintenance:** Perfective maintenance means adding new programs or modifying the existing programs to enhance the performance of the information system. This type of maintenance undertaken to respond to user's additional needs which may be due to the changes within or outside of the organization. Outside changes are primarily environmental changes, which may in the absence of system maintenance, render the information system ineffective and inefficient. These environmental changes include:
  - ✓ Changes in governmental policies, laws, etc.,
  - ✓ Economic and competitive conditions, and
  - ✓ New technology.

(What is system maintenance? What are its different types – Computer Notes n.d.)



**Self-Check 3 – Written Test**

**Direction :** Write down the description of the following categorize of maintenance.

1. **Corrective Maintenance**
2. **Adaptive Maintenance**
3. **Perfective Maintenance**

**Note: Satisfactory rating – 3 points**

**Unsatisfactory - below 3 points**

Score = _____
Rating: _____

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

**Answer Sheet**

1. \_\_\_\_\_  
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## Information Sheet 4- Respond to unplanned events or conditions.

### 4.1. Unplanned Events or Conditions.

Unplanned work could refer to anything from support escalations, to emergency outages, to feature requests coming in sideways, or stakeholder demands. This type of work can present several challenges to maintenance managers and their cross-functional teams.

- Unexpected Events or Conditions can impact the team's ability to deliver on planned activity.
- It can be difficult to communicate the impact of unplanned work to stakeholders.
- In some cases, unplanned work can lead to unsustainable work practices and an unhealthy culture.

What can product teams do about this? The short answer: don't just expect the unexpected, embrace it. First, get in the habit of thinking not all unplanned work is inherently bad. And rather than feeling as though you're at the beck and call of unplanned work, you can establish a structure for handling it. let we'll discuss a series of tried and true tactics for this.

#### I. Assess and Prioritize.

Before you figure out how you're getting the work done, it's wise to ask yourself why. Otherwise, you risk spending too much. In many situations, you can easily apply one of the commonly used plans to prioritize unplanned work. The caveat, however, is that these frameworks are only a starting point. At the end of the day, you need to tap into your maintenance manager's intuition when it comes time to make decisions about how to proceed.

#### II. Tactics for Tackling Unplanned Work

After you've assessed the importance of new work, you can decide how to actually get it done. There are a handful of different ways to handle unplanned.

- Squeeze it in to the current sprint.
- Throw it into the backlog.
- Carry it in to the next sprint.
- One item in, one item out.
- Tackle it in a pre-planned buffer
- Establish a dedicated team for reactive work.



~~Each of the methods above for dealing with unplanned work come with their own set of pros and cons. And there is no single “best” approach to tackling reactive work. Often, you can make these decisions on a case-by-case basis. However, establishing a pre-planned buffer within your development cycles is one smart way to keep unplanned work’s impact on delivery of planned work at a minimum. Of course, there are some situations where unplanned work needs to be handled immediately, and in those cases, you’ll need to do some shuffling to accommodate it.(4 Steps to Managing Unplanned Work – n.d.)~~



**Self-Check 4 – Written Test**

*Directions:* Answer all the questions listed below. Use the Answer sheet provided in the next page:

- 1. ~~What is Unplanned Events or Conditions?~~
- 2. ~~What is **Assess and Prioritize**?~~
- 3. ~~What is Tactics for Tackling Unplanned Work?~~

**Note: Satisfactory rating – 3 points**

**Unsatisfactory - below 3 points**

Score = _____
Rating: _____

**Answer Sheet**

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. \_\_\_\_\_  
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## Information Sheet 5— **Maintaining records and making documentation of servicing and maintenance activities.**

### 5.1. **Maintaining records**

You know maintenance is an essential aspect of your organization, but do you know record-keeping is a vital aspect of maintenance? In this lesson, we'll discuss just how crucial proper documentation is for keeping track of equipment's maintenance history and for making future determinations based on that data. Maintenance alone is helpful, but without consistent record-keeping, maintenance activities may get needlessly repeated, forgotten or occur at random intervals. (Why Record-Keeping Should Be A Top Maintenance Priority n.d.)

As we will see, proper maintenance record-keeping can save your company time, money and headaches. The record for each device should include identifying data such as a brief description, manufacturer, model, serial number, and location. It is helpful to also include data regarding the time and expense of providing scheduled and unscheduled maintenance services for the device.

These data are typically contained in work order records that provide documentation of every maintenance task performed on the device. (Medical equipment maintenance programme overview WHO Medical device technical series n.d.)

The equipment maintenance log is a simple document that shows all maintenance actions that have been performed on a specific asset. While the information it contains varies depending on the type of equipment/asset in question, a standard equipment maintenance log is often split into 2 distinct sections:

- **General information used to identify the asset**
- **List of performed maintenance actions on the asset and who performed them**

#### **General information usually covers:**

(Name of equipment, Model, Serial Number, Location) In some cases, the general info will also include Purchase date and Purchase price.

#### **List of performed actions usually covers the following information:**

- **Date** (when a certain action was performed)
- **Action description** (what was done)
- **Person performing said actions** (who performed it)



There are various free templates of equipment maintenance logs you can download if you are still using pen and paper to track your maintenance records.

***Here are a couple of examples of such equipment maintenance log templates:***

Equipment Maintenance Log						
Name of Equipment				Manufacturer's Contact Details		
Label:				Date of purchase:		
Serial Number:				Person responsible for equipment		
Manufacturer:				Date put into Service:		
Date	Maintenance Description	Maintenance performed by	Date of validation before put into service	Validation performed by	Next Maintenance planned on(date)	Remarks

Equipment Maintenance Log		
Equipment description: _____		
Serial Number: _____ Model Number: _____		
Date:	Action Taken/Comments:	Initials



**Self-Check 5 - Written Test**

*Directions:* Answer all the questions listed below. Use the Answer sheet provided in the next page:

- 1. What is Maintaining records ?
- 2. What are General information usually cover?
- 3. List of performed actions usually covers the following information?

**Note: Satisfactory rating – 3 points**

**Unsatisfactory - below 3 points**

Score = _____
Rating: _____

**Answer Sheet**

Name: \_\_\_\_\_ Date: \_\_\_\_/\_\_\_\_/\_\_\_\_

1. \_\_\_\_\_  
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3. \_\_\_\_\_  
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## Information Sheet 6 – Monitoring results of routine maintenance activities.

### 6.1. What is routine maintenance?

Routine maintenance refers to any maintenance task that is done on a planned and ongoing basis to identify and prevent problems before they result in equipment failure. Some common routine maintenance includes regular inspections or service work. These can be carried out on a time-based schedule or on a usage-based schedule. Typical examples of routine maintenance include:

- Lubricating, cleaning, or adjusting machinery
- Inspecting equipment to ensure proper operation and safety
- Replacing parts that show deterioration
- Checking, testing, and maintaining safety equipment, such as safety barriers, fire extinguishers, or alarm systems
- Checking for and replacing damaged signage or utilities, like light bulbs
- General workplace maintenance, such as cleaning floors, replacing HVAC filters, and washing windows, trash removal, and landscaping

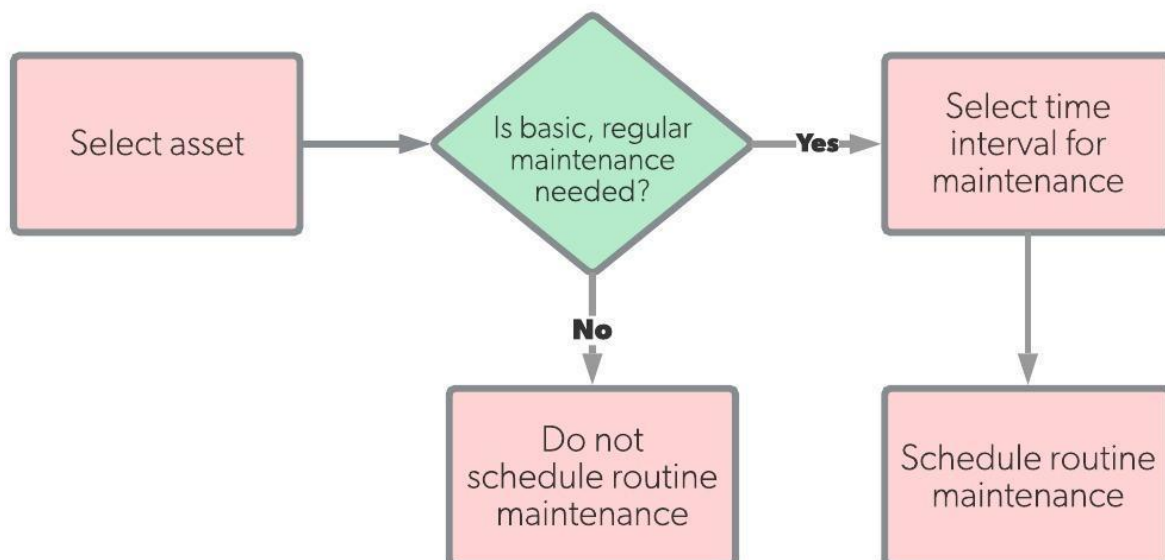


Figure 3: flow chart of routine maintenance?





## Information Sheet 7 – Acting shortfalls in quality outcomes.

Many maintenance departments today instead of approaching their problems systematically. Prevention is a far better goal than trying to solve problems as they arise. While this strategy may be a little costly at first, it is not nearly as expensive as allowing problems to occur.

Maintenance problem-solving is primarily concerned with four areas: maintaining critical systems, fixing the problem quickly and faster than the last time, determining what is causing the breakdown to happen so frequently, and identifying the 20 percent of breakdowns that are consuming 80 percent of your resources.

This information sheet focuses on the four common types of maintenance problems with the ultimate goal of helping you to prevent or at least minimize each type. The four common types of maintenance problems can be categorized as identification, cause/effect, means and ends. Let's discuss each of these in turn.

### Identification

When you don't understand a natural phenomenon, a question or a method of doing things, your natural inclination is one of curiosity. Industrial maintenance is the same way. You must identify (understand) everything in your department or plant or have someone on staff who does. When a problem occurs, you need to identify where and when it happened as well as where and when it did not. More importantly, you need to identify why you do things a certain way while always on the hunt for a better approach.



## Self-Check 7 - Written Test



## Operation Sheet 1

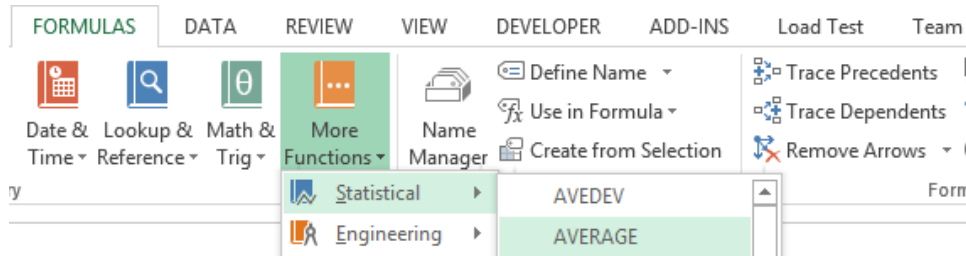
**NB:** before you start this operation sheet need to know BCO(basic computer operation)

### OPERATION SHEET #01

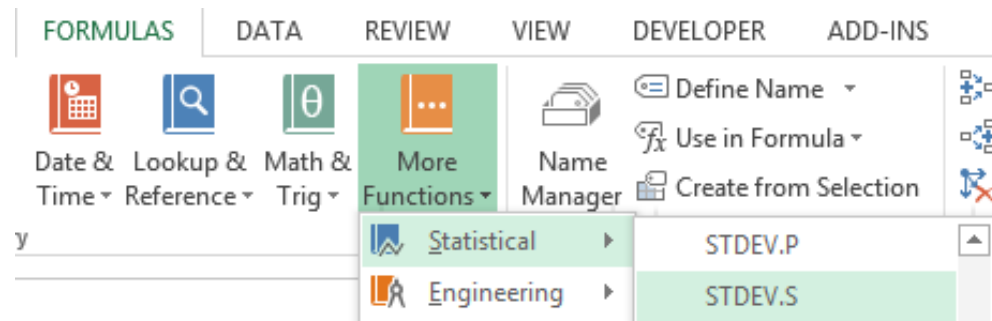
Operation title	Prepare Process Control Chart
Operation number	#01
Purpose	In This Operation Sheet You Will Learn How To Create Statistical Process Control Chart.
Equipment, tools and materials	<ul style="list-style-type: none"> <li>• Personal computer</li> <li>• Excel (software)</li> <li>• Printer</li> <li>• Paper</li> </ul>
Conditions or situations for the operations	Clean environment.

#### Procedures

1. First we are going to find the mean and standard.
2. Deviation. To find the mean click on the Formula tab, click on More Function select Statistical and then Average from the dropdown menu. Select cells B2 to B20 and press okay.



Click on the Formula tab, click on More Function select Statistical and then STDEV.S from the dropdown menu. Select cells B2 to B20 and press okay.



3. Type the following on work sheet
  - Select cell C1 and type "Mean (CL)" in it. Select C2 and type "=I\$1". Move your mouse to the bottom right of the cell until a black plus sign appear. Drag the plus sign all the way to cell C20





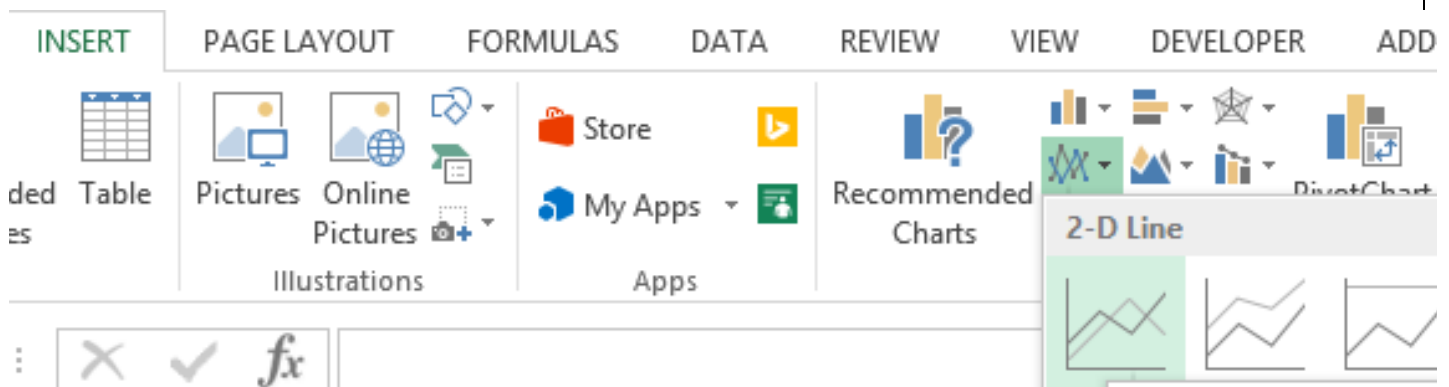
to copy the mean.

- Select cell D1 and type "UCL" in it.  
Select D2 and type "=\$I1+ (I\$2\*3)".  
Move your mouse to the bottom right of the cell until a black plus sign appear.  
Drag the plus sign all the way to cell D20 to copy the mean.
  - Note: UCL= upper control limit and is mean+3 times the standard deviation
- Select cell D1 and type "LCL" in it. Select

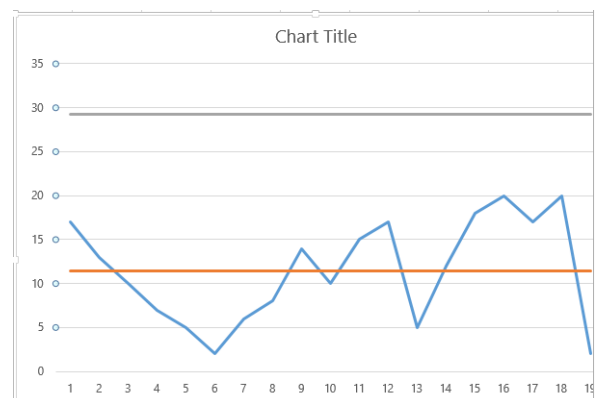
	B	C	D	E
	Sample Measures	Mean(CL)	UCL	LCL
	17	11.47368	29.2323	-6.28493
	13	11.47368	29.2323	-6.28493
	10	11.47368	29.2323	-6.28493
	7	11.47368	29.2323	-6.28493
	5	11.47368	29.2323	-6.28493
	2	11.47368	29.2323	-6.28493
	6	11.47368	29.2323	-6.28493
	8	11.47368	29.2323	-6.28493
	14	11.47368	29.2323	-6.28493

E2 and type "=\$I1+ (I\$2\*3)". Move your mouse to the bottom right

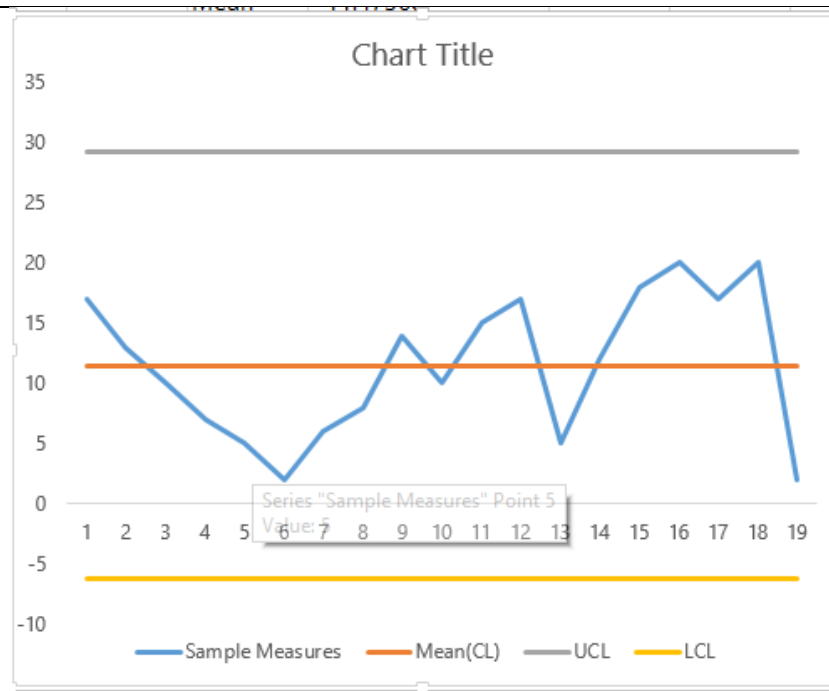
4. Click on Insert tab, click on [Line Chart](#) and then Click on Line.



- You have created your chart. Resize it. Remove the small black lines by double clicking on them and pressing Delete. That's it, you're done



5. This is what your final chart will look like.



Your Statistical process control chart is ready.

Precautions	<ul style="list-style-type: none"> <li>● Save your file D:\your Name" after each stapes</li> </ul>
Quality criteria	The final chart same like in the graph.

**LAP TEST 1**

1. Create Statistical Process Control Chart?



## Reference

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**BASIC BIOMEDICAL EQUIPMENT SERVICING Level IV**

**This TTLM is developed from respective EOS by: ↓↓↓↓**

No	Name of trainer	Qualification	Region	E-mail
1	MELESE RORESA	Electronics and communication technology management lecturer <b>(M.Sc.)</b>	Ethio-Italy Poly Technic College	<a href="mailto:melese.r2003@gmail.com">melese.r2003@gmail.com</a>
2	WONDIMU ZEYEDE	Biomedical Engineering Instructor <b>(B.Sc.)</b>	Addis Ababa Tegbared Polytechnic College	<a href="mailto:wondimzeyu336@gmail.com">wondimzeyu336@gmail.com</a>
3	TEBEJE BEYENE	Biomedical Engineering Instructor <b>(B.Sc.)</b>	Addis Ababa Tegbared Polytechnic College	<a href="mailto:tebejebme@gmail.com">tebejebme@gmail.com</a>
4	DECHASA AMDISA	Biomedical Engineering Instructor <b>(B.Sc.)</b>	Addis Ababa Tegbared Polytechnic College	<a href="mailto:amdissad@gmail.com">amdissad@gmail.com</a>