To: IE 366 Students
From: Dr. Ken Funk, Instructor
Subject: Time Study Lab Instructions
Date: 28 Feb 2012

This memo gives instructions for completing the time study lab.

Background

The task to be timed will be a circuit board assembly task. Figure 1 illustrates the work unit before and after assembly.

The class will be divided into pairs, each pair consisting of a time study Engineer and a Worker. Each pair will be provided with the work unit base board, parts, and a stopwatch.

![Figure 1: Circuit board assembly, input and output work units.]

Procedure

Use the following procedure to do the lab. Read the procedure in its entirety before beginning.

1. **Design the standard method.**
   
   **Both W & E** Work together to determine the “one best way” to assemble the unit.
   
   - Break the task down into work elements, following the guidelines given in lecture (see below).
   - Don’t forget to include one or more work elements to disassemble the unit for the next cycle.

2. **Define and document the standard method.**
   
   **2.1.** E Fill out a Time Study Sheet, including
   
   - Operation
   - Operator
   - Sketch of Workplace
   - Date of Study
   - Observer
   - Drawing of part [unit]

   **2.2.** E Record the work elements of the task on the back side of the Time Study Sheet.
3. **Time the task.**
   3.1. **W** Practice assembling the unit several times.
        **E** Practice operating the stopwatch:
        - If you have a No. 215 Meylan stopwatch, use the continuous method.
        - Otherwise, you may use the snapback method.
   3.2. **W** Complete at least six assembly cycles.
        **E** Time the work elements and record the times.
   3.3. **E** Assign a performance rating to each element.

4. **Compute Normal Time.** Show your work.
   4.1. **E** If continuous timing was used, calculate element times by subtraction.
   4.2. **E** Determine and record the minimum time for each element.
   4.3. **E** Calculate the average time for each element.
   4.4. **E** Compute the normal time for each element.
   4.5. **E** Compute the Normal Time for the task by summing element normal times.

5. **Compute Standard Time.** Show your work.
   **E** Compute the Standard Time for the task using an allowance of 15%.

6. **Switch roles and repeat steps 2 - 5.**

7. **Compare results.**
   **Both** Compare the results from the two timings. Explain any major discrepancies in the “Foreign Elements” block of each Time Study Sheet.

8. **Paper clip the two Time Study Sheets together and turn them in.**

**Note:** You may do the two instances of steps 4 and 5 (one for each pass) concurrently to save time.

**Supplementary Information**

**Work Element Guidelines (from lecture)**

- Each work element should consist of a logical group of motion elements.
  - e.g., reach, grasp, move, place
- Beginning point of one element should be end of previous.
  - No time gap between elements.
- Each element should have readily identifiable end point.
  - i.e., easily detected, no ambiguity
- Work elements should not be too long.
  - < “several” min
- Work elements should not be too short.
  - ≥ 3 sec
- Irregular elements should be identified & distinguished.
  - i.e., not every cycle
- Manual elements should be separated from machine elements.
  - generally constant values
- Internal elements should be separated from external elements.
  - i.e., performed by operator during machine cycle