

Comp. Lab. Session NO. 11

Subj.: Basic Graphical and Statistical Analysis of Experimental Data

DATE: Dec. 02, '15

Objectives: Using Excel and Mathematica to:

- i) Obtain graphical display of experimental data using dot frequency diagram, bar charts, frequency histogram;
- ii) Obtain the relative frequency function, and the cumulative frequency function

The data given in **Table-1** (given below) were obtained from an **experimental** tensile-strength testing of a steel-sheet.

Table-1: Experimental tensile-strengths of 30 test-specimen of a steel-sheet

Tensile strength x_i (kg/mm^2)														
44	43	41	41	34	44	43	44	42	45	43	35	44	45	46
42	45	41	44	44	43	44	46	41	43	45	45	42	44	37

Denoting the tensile strength as a discrete variable x_i , group the experimental data and build the frequency Table. Then, also use an EXCEL-sheet and Mathematica software to:

- plot experimental data histogram
- determine sample mean μ_x ,
- determine sample variance σ_x^2 and
- determine standard deviation σ_x .

Question:

1. Explain the importance of the statistical data obtained as regards determining the most probable strength of the sheet. .
2. Determine the probability P of x_i being less than 40 (that is: $P(x_i) \leq 40$ kg/mm^2).

Procedure for Lab.-Report Evaluation:

1. Start working in the assigned session, then complete your computer works preferably within the session or shortly afterwards using the same computing machine on which you may save your work for future use (if necessary).
2. Submit for evaluation your summary of organized computer work assignment in the beginning of the next lab.
3. Your report should include: i) **Introduction** explaining the work undertaken and its main objectives; ii) Clear outline of the numerical procedure(s) used; iii) **Print-out** of the work completed; and iv) **Summary** and conclusions.