

## TRANSFORMER DESIGN LAB – REVISED GUIDELINES

1. You need to design, manufacture and test **only one transformer**. The other two designs are not required.

The report needs to have the following points:

- a) the design logic you used for the target transformer including calculations, the measuring connection and facilities, and measurement results
  - b) comparison between measured and calculated results
  - c) correction factors defined by measurements, if any
  - d) the technical data of the transformer:
    - i. At no-load and at rated voltage: the secondary voltage, the primary current and power.
    - ii. At rated load and at rated primary voltage: the secondary voltage, output power, the primary current and power, efficiency, power factor, and the temperature rise using thermocouples and resistance measurement.
    - iii. At short-circuit and at rated secondary current: the primary voltage, current, and power, and the short-circuit impedance of transformer.
    - iv. Machine factor = power / volume.
    - v. The thermal model of transformer – Make the thermal network of the transformer at no-load operation, and **calculate the thermal resistances involved**.
2. After completion of transformer construction, each team makes a short 15 minutes presentation (5-8 slides) summarizing your work (5-7 min presentation and 5 minutes discussion and Q&A session). There will be two dates available for presentation that you can choose from.
  3. The grading of the lab is equally divided for:
    - The design and manufacturing of the transformer
    - The final report
    - The presentation/discussion.