Upload the e-record for:

Experiment #6: Taylor Series as a tool in fluid flow and heat transfer problems

Keep in mind the following points:

- Use different (unique) examples to make your e-record worthy of good grades.
- Do not upload pictures of the monitor screen containing the output instead save the figure in MatLab in an appropriate format and include it in the doc file.
- **The final submission must be in pdf format only.**
- Include the solution of the following problem(s) at the end of the e-record.

Exercise Problem:

In the case of transient heat conduction problems (such as quenching of the hot metal bodies in water) the temperature $T(x,t)$ is a function of time and spatial coordinate and satisfies the differential equation:

$$\frac{\partial T}{\partial t} = \kappa \frac{\partial^2 T}{\partial x^2}, \quad t > 0.$$

where κ is thermal diffusivity. Compare this problem with Stoke's first problem and verify that

$$T(x,t) = \text{erf}\left(\frac{x}{2\sqrt{\kappa\, t}}\right),$$

is a solution of the problem. Are all the multiples, derivatives and integrals also a solution of the equation? Plot the solution with respect to x for different values of t.