**AERO 430 – Assignment 1**

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1) Formulate the problem of heat conduction in a rod assuming convective boundary condition at x=0, following the Bradshaw Assignment 1 Report. **Everything is given to you are only asked to study it, understand and describe it in your own report.**

**Determine an Analytical Expression for the Exact Solution and use it to compute the Errors in all the Quantities Computed via FDM in Questions 2 & 3 below.**

2) Formulate and solve the Finite Difference Equations. Use the Bradshaw Assignment 2 report and the code provided in that report. Are you able to reproduce the numbers given in the Tables of the report?

3) Compute the Heat-Loss in two ways:

 a) By computing the heat entering the domain at x=L;

 b) By computing the total heat flux exiting the domain through Newton Cooling from the lateral surface and the cross-section at x=0. Present your results in the same way as Bradshaw using Tables & Graphs and report the Convergence Rates

**Note: The only new aspect is the calculation of the heat loss from the Newton Cooling** **surfaces, everything else is given in the Bradshaw report.** **Your goal is to understand them, REPEAT THE COMPUTATIONS, and** **include them in your report.** **PLUS to also compute the heat loss by integrating over the Newton Cooling Surfaces** **and to compare your answers, convergence curves with the ones in the attached reports.**