MEE 340 Project: Steady-State Heat Conduction Due 4:35 PM, Wednesday TBA

Submit a hardcopy for the following:

1. Study Ch. 4 on steady-state heat conduction using finite-difference method, in particular material included and pertaining to Table 4.2.

2. Do ONE of the following problems: 4.58, 4.60 or 4.62.

3. Create your own geometry for <u>heat conduction</u>, and set up appropriate boundary conditions. Solve for the temperature distributions, and present the results in a table and also in a contour plot.

4. Vary at least two thermal parameters, such as the wall temperature and ambient temperature, or heat transfer coefficient. Then, plot the heat flux variations at the "edge" surfaces in line plots at various parameter values.

5. Attach copies of the MATLAB program used to obtain the results. Briefly discuss the method, relevance and applications of the geometry that you used, and understanding of heat transfer that can be inferred from the results.

This is a "project" work, so it is open-ended (particularly Part 3). Therefore, details of the work is left to your own initiatives and interpretations. Try to resolve all questions on your own, and present the results in your own creative manner. The geometry and boundary conditions for Part 3 are up to you to create, and the more interesting and complex the better the evaluation will be. But of course, you have to generate accurate results, regardless of the geometry to get full credit.

Although discussions with peers are ok, individual work is required of the final product including the MATLAB programs and reports. This is a very small section, so identical or unusually similar MATLAB programs are highly unlikely. In such occurence, the credits will be divived among the "participants", and alternate, additional problems will be given to verify authenticity of the work.