# Department of Mathematics and Computer Science
# South Dakota School of Mines and Technology

Math 373 15_Explicit_PDQ

1. Solve a 1D USS HT problem on a spreadsheet using Saul'yev and DuFort-Frankel Methods. Use a zero flux BC at x=0 and a convection BC at x=L.

2. Solve a 1D USS HT problem with MATLAB using Saul'yev and DuFort-Frankel Methods. Use a zero flux BC at x=0 and a convection BC at x=L.

3. Write a MATLAB function that solves a tridiagonal matrix given columns containing the coefficients of a, b, c, and d. Create a variable n that equals the size of the matrix. Note that the values of a, b, and c are called the *coefficient matrix* and the d values comprise the *RHS matrix*. In many engineering problems the coefficient matrix depends on physical properties of the system and remains unchanged while the RHS matrix varies with the system's state such as temperatures or external applied stresses. Crank-Nicolson Method is an example of this. You may elect to write the function for invariant a, b, and c values as for Crank-Nicolson or make it more useful by accounting for different a values, b values, and c values.

4. Use the above routine to solve a 1D USS HC problem of your choice using MATLAB.