Introduction To Heat Transfer, 5th Edition Incropera, DeWitt ....pdf

a two-dimensional model for simulating the temperature distribution inside a microchannel heat exchanger with two single microchannels and two double microchannels is presented. the model consists of an analytical model for the thermal conductivity of fluids, heat transfer equations and the one-dimensional transient heat transfer equation. the solution to the transient heat transfer equation is obtained by numerical methods. in this exercise, you will model and analyze a static, loaded, spring system. the problem is adapted from the finite element textbook by daryl l. logan, a first course in the finite element method, third edition, copyright 2002, by wadsworth group, a division of thomson learning, inc. this exercise uses ansys to solve for the deflections and reaction forces for the system of problem 2.7 in that textbook. a simple model has been developed for the study of turbulent film condensation from downward flowing vapors onto a horizontal circular tube with variable wall temperature. the interfacial shear at the vapor condensate film is evaluated with the help of colburn analogy. the condensate film flow and local/or mean heat transfer characteristics from a horizontal tube with non-uniform temperature variation under the effect of froude number, sub-cooling parameter and system pressure parameter has been conducted. although the non-uniform wall temperature variation has an appreciable influence on the local film flow and heat transfer; however, the dependence of mean heat transfer on the non-uniform wall temperature variation is almost negligible.

the thermal conductivity of gas and liquid phase of a two-phase mixture is computed using molecular dynamic simulations for various volume fractions of the two-phase mixture. the thermal conductivity of the mixture is determined by computing the fourier’s law of heat transfer across the mixture. the thermal conductivity of the mixture is found to increase with the increase in volume

fraction of the liquid phase. the heat transfer between two parallel plates exposed to a flowing and mixed two-phase fluid is evaluated using the theory of thermal convection. the governing equations are solved with the help of finite difference method (fdm) and the second order central scheme. the effects of the film thickness, the density difference between the two phases, the heat and mass transfer coefficients and the temperature difference between the two plates on the heat transfer are investigated.

the numerical results are compared with the existing numerical solutions reported in the literature. the computational results show that the heat transfer increases with increase in the film thickness and also with increase in the difference in density between the two phases. however, the heat transfer decreases with increase in the heat and mass transfer coefficients. an experimental study was conducted to investigate the local and mean heat transfer coefficient at the vapor-liquid

interface of a bubble film flowing in a porous medium. the porous medium had a wide range of effective thermal conductivity, and the liquid flow was assumed to be steady. a bubble film of uniform temperature was forced to flow in the porous medium. the average heat transfer coefficient was found to decrease with increase in the effective thermal conductivity of the porous medium. the heat transfer rate was found to decrease with an increase in the froude number. the temperature field

was found to develop a hollow bubble shape at higher froude numbers, and the temperature at the film-porous medium interface was found to be different from the temperature of the film flow. 5ec8ef588b