

ECE299 Extra Credit Assignment

(Due next Monday.)

An unheated house has an effective overall thermal resistance $R_T = 0.001^\circ\text{F}\cdot\text{h}/\text{Btu}$. The effective overall thermal capacitance of the contents of the house is $C_p = 6000\text{Btu}/^\circ\text{F}$. The outside temperature varies approximately sinusoidally from 100°F at 2pm to 50°F at 2am. Predict the minimum temperature of the interior and the time at which it will occur.