

CE 890 Graduate Seminar

SPEAKER: Md. Sarwar Siddiqui (Advisor: Dr. Kyle A. Riding)

TOPIC: “Effects of Methods and Calculation Techniques on the Apparent Activation Energy (E_a) of Cementitious Materials”

DATE: March 31, 2010

TIME: 4:00 p.m. (refreshments at 3:45 p.m.)

PLACE: 2144 Fiedler Hall

ABSTRACT

The apparent activation energy (E_a) for cementitious materials represents the effect of temperature on the property development. There are several methods currently used to calculate the E_a of concrete. These methods vary in the properties measured, applicability, and ease of use. The E_a value also varies depending on the measurement technique used and calculation procedure. In this study, the time of set, chemical shrinkage, mortar strength, and isothermal calorimetry have been used to quantify E_a for 10 different cement binder systems using several different measurement and calculation techniques. The influence of aggregate on the measurement techniques and calculated E_a values have also been explored. This presentation will document the importance of E_a in concrete technology and construction, variation of E_a depending on various methods and calculation techniques, sensitivity of common calculations such as temperature modeling and strength prediction to E_a , and chemical shrinkage as a potential method for E_a calculation.