College of Engineering  
Summer Research Experience for Undergraduates Program  
Request for an Engineering Student for Summer 2013 Research

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Brief description of Summer Research Project (please explain the interdisciplinary nature of this project).

Cement-based materials, such as concrete, mortars, and fiber reinforced cement composites, are widely used in the construction of various civil infrastructure components. To improve the durability of structural components subjected to extreme exposure conditions, an in-depth knowledge of the chemical and physical characteristics of solid-water systems is required to understand the interactions of water and ionic species with the cement matrix. Through this interdisciplinary research project, we will work on the modeling of the diffusion of aqueous ions in the hydrated cement paste. The outcome of this study will improve the existing life-cycle prediction models by taking into account the major structural, environmental, and chemical aspects of the problem.

Brief description of what the student will be doing:

The student will be expected to complete the following tasks:
  1. A comprehensive literature study
  2. Identification of the major water-solid interaction mechanisms
  3. Simulation of the diffusion of aqueous ions in the cement matrix
  4. Write a final report on the completed activities, prepare a poster, and present the results.

Is this a CASA-related project? Yes ___ No x

Preferred background of student (major(s), class, GPA, pre-requisites, etc.):

A CEE or CHE student at junior or senior level
Must have a GPA of 3.2 or higher

Did you mentor a student last summer in the College REU Program?  
Yes____ No x

If yes, please describe the outcomes for that student (i.e. Honor’s thesis, conference presentations, manuscripts, papers, etc. Describe accomplishments to date as well as plans for the spring semester if the work has continued):

N/A

Please return this form to: lrobidou@ecs.umass.edu by February 1, 2013