Research Experience for Undergraduates (REU) in Structural Engineering

Summer 2012 and Academic Year 2012-2013

A 10-week REU program supported by the National Science Foundation’s (NSF) George E. Brown, Jr. Network for Earthquake Engineering Simulation (NEES) is planned for Summer 2012 (May 29 – August 3*) and Academic Year 2012-2013.

The REU program is focused on the fields of structural and earthquake engineering and will contribute to the goals of an ongoing large multi-institutional research project.

Applications should be submitted by Monday, March 5th 2012 to receive full consideration.

See the following link for application materials and Prof. Pollino for more details.

https://sites.google.com/a/case.edu/michael-pollino/srcrehab

Participants must be undergraduates in good academic standing majoring in Civil Engineering or a related field who have not yet completed their degree. NSF limits support for the program to U.S. citizens or permanent residents only.

Underrepresented students in engineering fields are particularly encouraged to apply.

A research stipend of $4800 will be provided.

*Summer dates of participation are somewhat flexible.

Research Project 1:
This project will evaluate the nonlinear force-deformation behavior of special steel members subjected to seismic loading. The research will first require review of existing literature for replaceable steel yielding devices, possibly consisting of yielding shear panels or short reduced beam section (RBS) links. Experimental testing of the device will be performed in the Structural Engineering Laboratory at CWRU to evaluate its behavior for seismic design. Advanced computer analysis will also be performed for comparison.

Research Project 2:
This project includes performance assessment and rehabilitation of selected seismically sub-standard demonstration buildings. The researcher will calculate existing capacity and performance of building frames utilizing SEI/ASCE 41 guidelines and analytical models. The buildings will be retrofitted with a new approach for seismic rehabilitation utilizing stiff rocking cores (SRC) and also using buckling-restrained braces for comparison. Use of an SRC for rehabilitation will be qualitatively compared and contrasted in terms of architectural impact, constructability, and cost. Seismic performance will be evaluated through computational analyses.