



**Presented By:**  
**Dimitris Pitilakis, Ph.D.**  
**Assistant Professor**  
*Department of Civil Engineering*  
Aristotle University of Thessaloniki, Greece

# Civil Engineering *Seminar Series*

*Thursday, February 11th, 2016*  
**MDEA**  
**2:00PM - 3:00PM**

## Elastic Seismic Demand Of Soil-Foundation Structure Systems

Soil-foundation-structure interaction modifies the foundation response of a system, and therefore its elastic seismic demand. Typically, in design codes seismic demand is calculated by the intersection of the free-field demand spectrum with the fixed-base structure's period. More elaborate approximations use the intersection of the free-field with the effective period of the coupled system. FEMA440 and NIST2012 go one step further and propose use of the "foundation input motion" instead of the free-field motion, accounting for kinematic interaction, whereas inertial interaction is considered in a subsequent step. An alternative approximation will be presented based on appropriate modification factors of the free-field demand, to evaluate the actual demand of typical bridge piers considering SFSI.



Dimitris Pitilakis is Assistant Professor in the Department of Civil Engineering of Aristotle University of Thessaloniki, Greece (M.Sc. University of California, Berkeley, Ph.D. in earthquake engineering from Ecole Centrale Paris, France). He

is an expert in geotechnical earthquake engineering, with emphasis on soil – foundation – structure interaction, dynamics of foundations and performance-based geotechnical design. He is member of national and international scientific societies on Earthquake Engineering and reviewer of international scientific journals. He has developed scientific software for the simulation of the soil- foundation-structure interaction, with emphasis on nonlinear soil behavior, as well as software for estimating surface foundation bearing capacity and settlements. He has significant experience in experimental soil-foundation-structure interaction in small-scale (shaking table and centrifuge) and full-scale (EuroProteas in Euroseistest <http://euroseisdb.civil.auth.gr/sfsis>).

