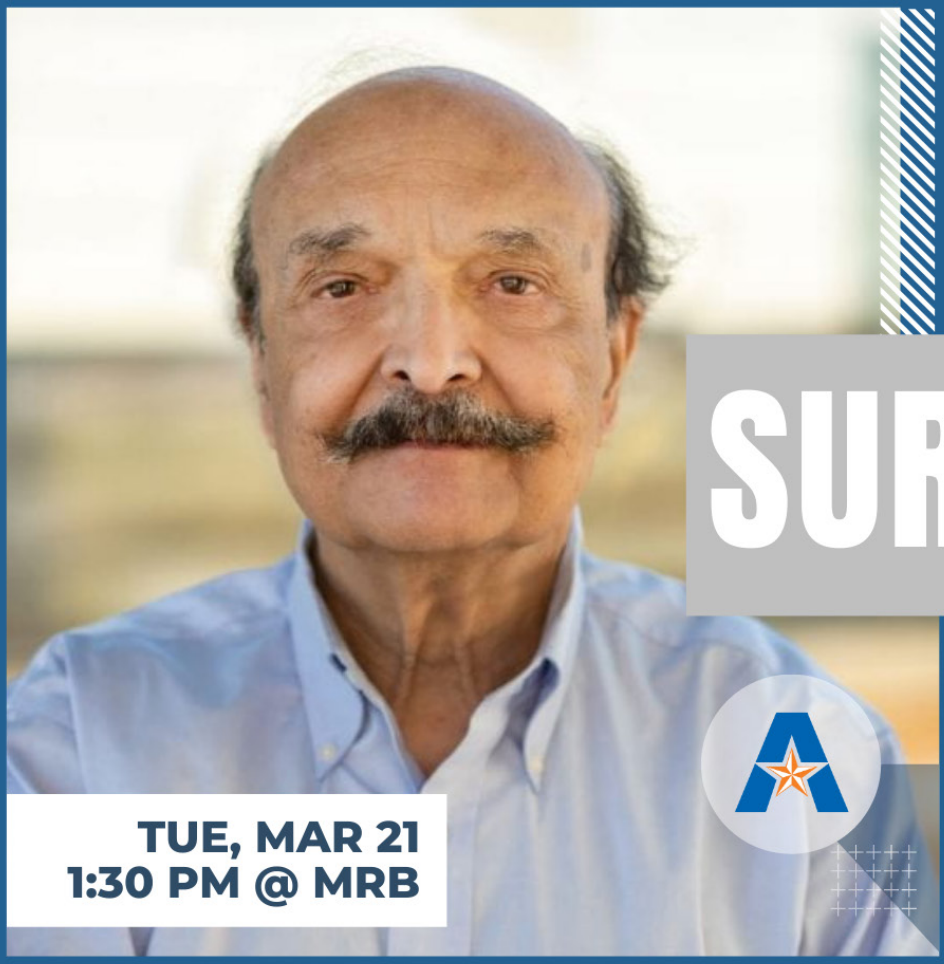

FAMU-FSU College of Engineering

DISTINGUISHED SEMINAR SERIES

SURENDRA SHAH

TUE, MAR 21
1:30 PM @ MRB

WALTER P. MURPHY EMERITUS PROFESSOR
NATIONAL ACADEMY OF ENGINEERING
NATIONAL ACADEMY OF INVENTORS
CIVIL & ENVIRONMENTAL ENGINEERING
UNIVERSITY OF TEXAS AT ARLINGTON

"Nanotechnology in Construction: A Way Toward Sustainability"

AS CONCRETE IS ONE OF THE most used construction materials, lowering its environmental impacts is crucial for a more sustainable built environment. Advancements in nanotechnology over the past decade have paved the way for the creation of novel material compositions that have opened several avenues for the applicability of nano-engineered concrete. Extensive research on the use of nanomaterials has shown remarkable improvement in strength, durability, thermal-electrical properties, self-healing, and self-cleaning of concrete due to their nanoscopic functionalities. Effective dispersion of nanomaterials plays an important role in altering the concrete properties at nanoscale, which directly improves the micro and macro-scale performance of concrete. This talk will focus on the wide applications of nanomaterials in concrete from their synthesis to performance enhancement to environmental impact. Literature suggests the effective and systematic study of nanomaterials is not only limited to mechanical and durability property improvement but also promotes the reduction of cement content, which might result in a reduction of CO_2 emissions.

According to recent research, nanomaterials (such as graphene, nanoplatelets, CNTs/CNF, and nano-TiO_2) have the potential for enhancing concrete's ability to capture carbon under accelerated conditions and fostering carbonate mineralization. Carbon sequestration enhances the mechanical properties of concrete while lowering cement volume requirements. Most importantly, it permanently removes CO_2 from the atmosphere, significantly reducing the environmental effect of producing concrete.

DR. SURENDRA SHAH is distinguished for his seminal research on synthesizing engineering mechanics and material science. Professor Shah has made unique, original and extensive contributions to better understand and define properties of cement-based materials and developing new advanced materials which has become a world standard in these fields. He is responsible for developing high performance concrete, fibre reinforced concrete, self-consolidating concrete, shrinkage reducing admixtures, carbon nano-tube reinforced cement based composites and extrusion processing of concrete. These have revolutionized the way modern concretes are used worldwide. Dr. Shah has been recognized with many awards and honors, notably he is a member of the National Academy of Inventors, National Academy of Engineering, Academy of Athens, Chinese Academy of Engineering, Indian Academy of Engineering, and the Russian Academy of Engineering. Dr. Shah is currently the Director of the Center for Advanced Construction Materials and Presidential Distinguished Professor at the University of Texas at Arlington and Emeritus Professor at Northwestern University.