Bharatiya Vidya Bhavan's
SARDAR PATEL COLLEGE OF ENGINEERING
(Government Aided Autonomous Institute)
Munshi Nagar, Andheri (W) Mumbai – 400058

NOTICE

All faculty and students are invited for interdisciplinary guest lecture by SPCE alumnus, Dr. Sushrut Vaidya (Civil Dept. Batch 2005). Faculty and students from all departments are encouraged to attend.

Date: 17th February 2023

Time: 3:30 pm

Venue: Room 119

Bio of the speaker and abstract of the talk is attached.

Principal

From Fuel Cells to Lunar Habitats: Exploring the Versatility of Applied Mechanics Through Interdisciplinary Research

Sushrut Vaidya, Ph.D.
Former Postdoctoral Research Associate, Department of Civil and Environmental Engineering, University of Connecticut, Storrs, USA

Abstract

Applied mechanics is the cornerstone of several engineering disciplines, including civil engineering, mechanical engineering, and aerospace engineering. The traditional undergraduate curriculum in these engineering disciplines typically provides instruction in the basic branches and applications of mechanics (e.g., solid mechanics and structural design) but does not include much discussion of the interdisciplinary aspects of mechanics (e.g., biomechanics, aeroelasticity, etc.); such topics are usually discussed in specialized postgraduate courses. However, most real-world problems involving engineering analysis and design are interdisciplinary in nature and require application of concepts drawn from various areas of scientific and engineering knowledge. Thus, this talk has two main aims: (a) to introduce engineering undergraduates to the idea of interdisciplinarity; and (b) to demonstrate the versatility and wide applicability of the concepts of mechanics. This is achieved by discussing the analysis of two interdisciplinary research problems in computational mechanics using a combination of basic and advanced ideas drawn from several fields of science and engineering, including solid mechanics, numerical simulation, materials science, and image processing. The first problem involves computational analysis of thermal stresses in the microstructures of fuel cell components, while the second investigates computational modeling of lunar habitats under meteoroid impact loading. The methods and models employed in the analyses are summarized, and important results are discussed. Emphasis is placed on highlighting the application of principles of mechanics to the analysis of interdisciplinary research problems.

Presenter's Biographical Sketch

Sushrut Vaidya is a researcher and educator in the field of Applied Mechanics. An alumnus of Sardar Patel College of Engineering, Sushrut earned his B.E. (2005) in Civil Engineering from the University of Mumbai. He holds an M.Tech. (2008) in Ocean Engineering and Naval Architecture from the Indian Institute of Technology Kharagpur and a Ph.D. (2013) in Civil Engineering, with an Applied Mechanics concentration, from the University of Connecticut, Storrs, USA. Dr. Vaidya has several years of interdisciplinary research experience in various areas of computational and analytical mechanics. He has worked on modeling and simulation projects funded by U.S. agencies such as the National Science Foundation (NSF), National Aeronautics and Space Administration (NASA), and Department of Homeland Security (DHS), through grants awarded to his research supervisors. During his tenure as a researcher at IIT Bombay, he worked on a self-initiated research project and also briefly served as a Project Research Scientist at National Centre for Aerospace Innovation and Research (NCAIR, IIT Bombay). The above-mentioned projects have ranged over a number of topics, from thermal stresses in material microstructures and analytical modeling of aircraft collision avoidance systems to meteoroid impact loads on lunar habitat structures. In collaboration with his research supervisors and colleagues, he has published several peer-reviewed papers in international journals and conferences.