

INFORMATION ON THE NEW CONTRIBUTIONS OF THE DOCTORAL DISSERTATION

Title of the doctoral dissertation: **Static and dynamic analysis of functionally graded doubly curved microshell**

Academic discipline : Mechanical Engineering

Code : 9.52.01.03

Full name of PhD candidate : Khuat Duc Duong

The doctoral supervision team consists of:

1. Assoc. Prof. Dr. Nguyen Tuan Linh – Hanoi University of Industry
2. Assoc. Prof. Dr. Dao Nhu Mai – Institute of Mechanics, Vietnam Academy of Science and Technology

Name of training institution: Hanoi University of Industry

NEW CONTRIBUTIONS OF THE DISSERTATION

The thesis covers a wide range of topics, including static bending, free vibration, stability, dynamics, and optimization, all organized in a logical structure. It is grounded in first-order shear deformation theory, modified couple stress theory, and the isogeometric analysis method. These aspects of the research are reflected in publications appearing in prestigious international and national journals.

The thesis models and analyzes the static bending, free vibration, static and dynamic stability, and forced vibration responses of doubly curved microshells made of functionally graded materials (varying in two directions) and resting on an elastic foundation.

The doubly curved microshell model is constructed using materials with properties varying along both the length and thickness, while also accounting for small-scale size effects.

The thesis employs classical shear deformation theory and first-order shear deformation theory—integrated with modified couple stress theory—to comprehensively analyze the mechanical behavior of microshell structures, addressing static bending, free vibration, stability, and forced vibration.

It formulates the fundamental problems for microshell structures and develops corresponding flowcharts to facilitate computational implementation using MATLAB.

It also applies optimization techniques to identify suitable parameter sets, thereby reducing computational time for practical applications.

Supervisor 2

Supervisor 1

Graduate Student