

CERTIFICATE



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ICAENS 2025



**8th International Conference on Applied Engineering and
Natural Sciences ICAENS 2025**

August 22-23, 2025: Konya, Turkey

Abstract Book

ABSTRACT BOOK OF 8TH INTERNATIONAL CONFERENCE ON APPLIED ENGINEERING AND NATURAL SCIENCES ICAENS 2025

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INTRODUCTION

We had the great honor of 8th International Conference on Applied Engineering and Natural Sciences ICAENS 2025. It was truly a great pleasure for us to greet a lot of participants from many different countries attending ICAENS 2025! We firmly believe that the conference will become an important international event in the field of cross-industry discussion about innovations in Academic Studies.

Three cooperating organizations supported the two-day conference. There were 216 papers accepted for presentation at ICAENS 2025, contributed from different countries. We had plenary speeches and several well-known scientists and experts, to give invited talks at different sessions.

The purpose of ICAENS 2025 was to provide a forum for the participants to report and review innovative ideas, with up-to-date progress and developments, and discuss novel approaches to the application in the field of their own research areas and discuss challenges of doing science.

We sincerely hope that the exchange of ideas on doing research, science and improving education will help the participants, and international cooperation sharing the common interest will be enhanced.

On behalf the Organization Committee of ICAENS 2025, we would like to heartily thank our cooperating organizations for all they have done for the conference. We would also like to thank the authors for their contribution to the proceedings; the participants and friends of ICAENS 2025, for their interest and efforts in helping us to make the conference possible; and the Editorial boards for their effective work and valuable advice, especially the ICAENS 2025 secretariat and the ICAENS 2025 staff, for their tireless efforts and outstanding services in preparing the conference and publishing the Proceedings.

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Strain-based finite element formulation for the analysis and modelling of structures

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Abstract – This work introduces a novel four-node quadrilateral finite element based on the strain approach and the first-order shear deformation theory for the static analysis of homogeneous isotropic and linear elastic Reissner–Mindlin plates.

The developed element possesses six essential degrees of freedom per node. This element is obtained by the superposition of two strain-based elements where the first is a membrane SBREDR (Strain Based Rectangular Element with Drilling Rotation).

This rectangular finite element has the three degrees of freedom at each of the four corner nodes (the two translations U_i , V_i , and the in-plane rotation B_i) and the displacement functions of the developed element satisfy the exact representation of the rigid body modes. And the second is a Reissner–Mindlin plate that has three degrees of freedom per node. The displacements field of the proposed element which contains higher-order terms is based on assumed strain functions satisfying compatibility equations. The performance of the suggested element is evaluated through several tests and the obtained results are compared with available solutions from the literature. The results of the present element have proved excellent accuracy and efficiency in predicting bending and free vibration of homogeneous isotropic Reissner–Mindlin plates.

Keywords – Finite Element; First-Order Shear Deformation Theory; Reissner–Mindlin; Strain-Based;

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