

Dr. Shashank Pandey

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Research Interests:

Computational Structural Mechanics, Finite Element Method, Composite and Sandwich Structures, Functionally Graded Materials, Plates and Shell Theories.

Educational Qualification:

Ph.D. (2017): Applied Mechanics, Indian Institute of Technology Delhi, New Delhi, India.

Thesis Title: Static and Dynamic Analyses of Laminated and Functionally Graded Sandwich Panels using a Layerwise Theory.

M. Tech. (2012): Design and Production Engineering, NIT Durgapur, West Bengal, India.

Thesis Title: Attitude Control of an Inverted Pendulum System using Fuzzy Logic Controller.

B. Tech. (2008): Mechanical Engineering, Dr. A.P.J. Abdul Kalam Technical University.

Professional Experience:

Assistant Professor (24th -May-2018-Till Date): Department of Mechanical Engineering, NIT Jamshedpur, Jamshedpur-831014, (AGP 6000/-).

Senior Project Engineer (01st -November-2017-12th –May-2018): Department of Mechanical Engineering, IIT Kanpur, Kanpur-208016.

Lecturer (1st –August-2008-08th –June-2009): Maharana Institute of Professional Studies, Kanpur-208017.

List of Journal Publications

1. A. Karakoti, P. Mahesh, Shashank Pandey, V. R. Kar. Effect of porosity and skew edges on transient response of functionally graded sandwich plates. **The Journal of Strain Analysis for Engineering Design** (Accepted, 2021).
2. A. Karakoti, Shashank Pandey, V. R. Kar. Dynamic response analysis of P and S FGM sandwich cylindrical shell panels using a new layerwise method. **Structural Engineering and Mechanics: An International Journal** (<https://doi.org/10.12989/sem.2021.80.4.000>), 2021.
3. Shashank Pandey, S. Pradyumna. Thermal shock analysis of functionally graded sandwich curved beams using a new layerwise theory. **ZAMM-Journal of Applied Mathematics and Mechanics** (<https://doi.org/10.1002/zamm.202100020>), 2021.
4. Shashank Pandey, S. Pradyumna. Thermal shock response of porous functionally graded sandwich curved beam using a new layerwise theory. **Mechanics Based Design of Structures and Machines** (<https://doi.org/10.1080/15397734.2021.1888297>), 2021.
5. Shashank Pandey, S. Pradyumna. S.S. Gupta. Static and dynamic analyses of functionally graded sandwich skew shell panels. **Journal of Sandwich Structures and Materials** (<https://journals.sagepub.com/doi/full/10.1177/1099636220983653>), 2021.
6. Shashank Pandey, S. Pradyumna: Analysis of functionally graded sandwich plates using a higher-order layerwise theory. **Composites Part B: Engineering** 153, 325-336, 2018.
7. Shashank Pandey, S. Pradyumna: Transient stress analysis of sandwich plate and shell Panels with functionally graded material core under thermal shock, **Journal of Thermal Stresses** 41, 543-567, 2018.
8. Shashank Pandey, S. Pradyumna. A finite element formulation for thermally induced vibrations of functionally graded material sandwich plates and shell panels. **Composite Structures** 160, 877–886, 2017.
9. Shashank Pandey, S. Pradyumna. A layerwise finite element formulation for free vibration analysis of functionally graded material sandwich shells. **Composite Structures** 133, 438-450, 2015.

10. Shashank Pandey, S. Pradyumna. A new C_0 higher-order layerwise finite element formulation for the analysis of laminated and sandwich plates. **Composite Structures** 131, 1-16, 2015.
11. Shashank Pandey, S. Pradyumna. Free vibration of functionally graded sandwich plates in thermal environment using a layerwise theory. **European Journal of Mechanics-A/Solids** 51, 55- 66, 2015.

List of Conference Publications:

1. A. Karakoti, Shashank Pandey, V. R. Kar. Blast analysis of functionally graded sandwich plates. **Material todays Proceedings** 46(17), 7871-7874, 2021.
2. A. Karakoti, Shashank Pandey, V. R. Kar. Nonlinear transient analysis of porous functionally graded material plates under blast loading. **Material todays Proceedings** 46(17), 8111-8113, 2021.
3. A. Karakoti, Shashank Pandey, V. R. Kar. Transient analyses of FGM sandwich cylindrical shell panels under air-blast load. **AIP Conference Proceedings** 2341, 1, 020014, 2021.
4. A. Karakoti, Shashank Pandey, V. R. Kar. Free vibration response of P-FGM and S-FGM sandwich shell panels: A comparison, **Materials Today: Proceedings** 28(3), 1701-1705, 2020.
5. A. Karakoti, Shashank Pandey, V. R. Kar. Bending analysis of sandwich shell panels with exponentially graded core, **Materials Today: Proceedings** 28(3), 1706-1708, 2020.
6. Shashank Pandey, S. Pradyumna. Transient stress analysis of skew sandwich shell panels with FGM core subjected to thermal shock. 7th International Congress on Computational Mechanics and Simulation, **IIT Mandi**, 11th -13th December 2019.
7. Shashank Pandey, S. Pradyumna. Transient stress analysis of skew sandwich plate with FGM core subjected to thermal shock. Engineering Mechanics Institute Conference 2019, **California Institute of Technology, USA**, 18th -21st June 2019.

8. Shashank Pandey. Thermally induced vibration analysis of skew functional graded sandwich shell panels. 4th Indian Conference on Applied Mechanics (INCAM 2019), **IISc. Bangalore**, 3rd -5th July 2019.
9. Shashank Pandey, S. Pradyumna. Transient analysis of skew FGM plate under thermal shock, 25th Annual International Conference on Composite Nano Engineering (ICCE 25), **Rome, Italy**, 16th -22nd July 2017.
10. Shashank Pandey, S. Pradyumna. Thermally-induced vibration analysis of functionally graded sandwich beams. 3rd Indian Conference on Applied Mechanics (INCAM 2017), **MNNIT Allahabad**, 5th -7th July 2017.
11. Shashank Pandey, S. Pradyumna, Stress analysis of functionally graded sandwich beams subjected to thermal shock. **Procedia Engineering** (*special issue of IMPLAST 2016*), 173, 837-843, 2017.
12. Shashank Pandey, S. Pradyumna. Analysis of laminated and sandwich shells using a higher-order layerwise theory. Structural Engineering Convention (SEC 2016), **CSIR-Structural Engineering Research Centre, Chennai**, 21st -24th, December 2016.
13. Shashank Pandey, S. Pradyumna. A finite element formulation for rapid heating of functionally graded material shells. 11th International Congress on Thermal Stresses 2016 (TS 2016), **Salerno, Italy**, 5th -9th, June 2016.
14. Shashank Pandey, S. Pradyumna. A layerwise finite element formulation for free vibration analysis of sandwich shells with functionally graded core. 2nd Indian Conference on Applied Mechanics (INCAM 2015), **IIT Delhi**, 13th -15th, July 2015.
15. H.K. Sahu, Shashank Pandey, S. Pradyumna. Dynamic stability analysis of sandwich plates using a layerwise theory. 2nd Indian Conference on Applied Mechanics (INCAM 2015), **IIT Delhi**, 13th -15th, July 2015.
16. Shashank Pandey, S. Pradyumna. An accurate prediction of natural frequencies of sandwich plates with functionally graded material core in thermal environment using a layerwise

theory. Structural Engineering Convention (SEC 2014), **IIT Delhi**, 22nd -24th, December 2014. (Published in Advances in Structural Engineering 171-180, Springer, India).

17. **Shashank Pandey**, S. Pradyumna. Analysis of sandwich shells with functionally graded material core using a layerwise C_0 finite element formulation. The Fourth Asian Conference on Mechanics of Functional Materials and Structures (ACMFMS 2014), **Osaka Institute of Technology, Nara, Japan**, 10th -13th, October 2014.
18. **Shashank Pandey**, S. Pradyumna. Static analysis of functionally graded sandwich shells using a layerwise theory. 5th International Congress on Computational Mechanics and Simulation (ICCMS 2014), **Structural Engineering Research Centre, Chennai**, 10th -13th, December 2014.
19. **Shashank Pandey**, S. Pradyumna. Analysis of sandwich plates with a new layerwise higher-order C_0 finite element formulation, International Conference on Theoretical, Applied, Computational and Experimental Mechanics (ICTACEM IV), **IIT Kharagpur**, 29th -31st, December 2014.
20. **Shashank Pandey**, S. Pradyumna. Finite element analysis of sandwich plates with functionally graded material core using a layerwise theory. International Conference on Structural Engineering and Mechanics (ICSEM 2013), **NIT Rourkela**, 20th – 22nd, December 2013.

Research Project Details:

1. Blast Analysis of Functionally Graded Material Plate and Shell Panels (Ongoing), Principal Investigator, Funding Agency: **Science and Engineering Research Board (SERB)**, Gov. of India; Duration: March 2019-March 2022. (Sanctioned Amount: 17.36 Lakh).

Courses Taught:

UG Courses:

1. Mechanics of Solids
2. Engineering Mechanics
3. Operational Research

PG Courses:

1. Advanced Mechanics of Solids
2. Mechanics of Composite Materials

Group Members

Ph.D.:

1. Abhilash Karakoti. Continuing July 2019 Onwards
Title: Blast Analysis of Functionally Graded Material Plate and Shell Panels (Co-Supervisor: Dr. V. R. Kar).

M. Tech.:

1. P. Mahesh, Graduated in June 2020
Title: Dynamic Analysis Functionally Graded Material Sandwich Plates.
2. Ashok Kumar, Graduated in June 2020
Title: Effect of Thickness Stretching on Static and Dynamic Analysis of Laminated Composites and Softcore Sandwich Plates.
3. Devanand Giri, Graduated in June 2021
Title: A refined Higher-Order Shear Deformation Theory for Analyses of Sandwich and FGM Plates.
4. Md. Amir Amber, Continuing May 2021
Title: Dynamic Analysis of Smart Composite Materials.