Curriculum Vitae

Prasun Jana

Assistant Professor
Department of Aerospace Engineering
Indian Institute of Technology Kharagpur
Kharagpur-721302, India.

E-mail: prasun@aero.iitkgp.ac.in; prasunjana@gmail.com
Google scholar page: Click this link.

Research Interests

- Aerospace structures
- Vibration analysis
- Elastic stability of structures
- Finite Element analysis
- Composite structures
- Functionally graded plates
- Structural optimization

Education

Qualification	*Department*	*Institute*
PhD	Mechanical Engineering	IIT Kharagpur
MS	Aerospace Engineering	IIT Madras
BE	Mechanical Engineering	IIEST, Shibpur

Employment

Organization	*Position held*	*Duration*
IIT Kharagpur	Assistant Professor	June 2018 - present
IIT Dhanbad	Assistant Professor	Nov 2015 - May 2018
IIT Mandi	Assistant Professor	Feb 2014 - Nov 2015
IIT Kanpur	Consultant (DST Project)	Sep 2013 - Jan 2014
GE, Bangalore	Engineer	Jul 2007 - Jan 2010
ISRO, Trivandrum	Scientist C	Jan 2005 - Jul 2007

Journal Publications

Refereed International Journals

25. Mahapatra, B.P., Sinha, V., Maiti, D.K., **Jana, P.**, Active vibration suppression of tetrachiral auxetic core sandwich panel with CFRP skin: An RVE homogenization-assisted finite element approach, ***European Journal of Mechanics/A Solids***, 106, 105282, 2024. Download link

24. Das, S., **Jana, P.**, Buckling analysis of non-uniformly compressed rectangular FG-CNT reinforced laminated composite plate resting on elastic foundation: An analytical solution, ***Mechanics of Advanced Materials and Structures***, 2024. Download link

23. Kumar, R., **Jana, P.**, Dynamic stiffness method for exact modal analysis of sigmoid functionally graded rectangular plate resting on elastic foundation, ***Archive of Applied Mechanics***, 1-30, 2023. Download link

22. Kumar, R., **Jana, P.**, Comments on "Sigmoid functionally graded plates embedded on Winkler-Pasternak foundation: Free vibration analysis by dynamic stiffness method" [Compos. Struct. 288 (2022) 115400], ***Composite Structures***, 325: 117619, 2023. Download link

21. Kumar, R., **Jana, P.**, Vibration response of FG-CNTRC plate resting on non-homogeneous elastic foundation via a closed-form dynamic stiffness formulation, ***Structures***, 57, 105203, 2023. Download link

20. Das, S., **Jana, P.**, Rigorous plane-stress solution and buckling analysis of rectangular functionally graded plates subjected to non-uniform edge loads, ***Mechanics Based Design of Structures and Machines***, 2023. Download link

19. Kumar, S., **Jana, P.**, Accurate solution for free vibration behaviour of stepped FGM plates implementing the dynamic stiffness method, ***Structures***, 45, 1971-1989, 2022. Download link

18. Kumar, R., **Jana, P.**, Exact modal analysis of multilayered FGCNT plate assemblies using the dynamic stiffness method, ***Mechanics of Advanced Materials and Structures***, 2022. Download link

17. Kumar, R., **Jana, P.**, Free vibration analysis of uniform thickness and stepped P-FGM plates: A FSDT-based dynamic stiffness approach, ***Mechanics Based Design of Structures and Machines***, 2022. Download link

16. Choudhary, P.K., Mahato, P.K. and **Jana, P.**, Optimization of surface-profile of orthotropic cylindrical shell for maximizing its ultimate strength, ***Mechanics of Advanced Materials and Structures***, 2021. Download link

15. Choudhary, P.K., Mahato, P.K. and **Jana, P.**, Cross-section optimization of thin-walled open-section composite column for maximizing its ultimate strength, ***Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications***, 2021. Download link

14. Kumar, S. and **Jana, P.**, Application of dynamic stiffness method for accurate free vibration analysis of sigmoid and exponential functionally graded rectangular plates, ***International Journal of Mechanical Sciences***, 163, 2019. Download link

13. Alam, I., Kanagarajan, B. and **Jana, P.**, Optimal design of thin-walled open cross-section column for maximum buckling load, ***Thin-Walled Structures***, 141, 423–434, 2019. Download link

12. Ranjan, R., Mallick, A. and **Jana, P.**, Thermoelastic study of a functionally graded annular fin with variable thermal parameters using semiexact solution, ***Journal of Thermal Stresses***, 42, 1272–1297, 2019. Download link

11. Choudhary, P.K. and **Jana, P.**, Position optimization of circular/elliptical cutout within an orthotropic rectangular plate for maximum buckling load, ***Steel and Composite Structures***, 29(1),39–51, 2018. Download link

10. Kumar, S., Ranjan, V. and **Jana, P.**, Free vibration analysis of thin functionally graded rectangular plates using the dynamic stiffness method, ***Composite Structures***, 197, 39–53, 2018. Download link

9. **Jana, P.**, Elastic-plastic behavior of an ellipsoidal inclusion embedded in an elastic matrix, ***Procedia Engineering***, 173, 1116-1121, 2017. Download link

8. **Jana, P.**, Optimal design of uniaxially compressed perforated rectangular plate for maximum buckling load, ***Thin-Walled Structures***, 103, 225–230, 2016. Download link

7. Biswas, S., **Jana P.** and Chatterjee, A., Hysteretic damping in an elastic body with frictional microcracks, ***International Journal of Mechanical Sciences***, 108–109, 61–71, 2016. Download link

6. **Jana, P.** and Chatterjee, A., Computational prediction of modal damping ratios in thin-walled structures, ***Journal of Sound and Vibration***, 333, 7125–7134, 2014. Download link

5. **Jana, P.** and Chatterjee, A., Power-law damping from dispersed elasto-plastic flaws with Weibull-distributed strengths, ***International Journal of Mechanical Sciences***, 87, 137–149, 2014. Download link

4. **Jana, P.** and Chatterjee, A., Modal damping in vibrating objects *via* dissipation from dispersed frictional microcracks, ***Proceedings of the Royal Society* A**, 469: 20120685, 2013. Download link

3. **Jana, P.** and Bhaskar, K., Analytical solutions for buckling of simply supported rectangular plates under non-uniform biaxial compression or uniaxial compression with lateral restraint, ***International Journal of Mechanical Sciences***, 49(10), 1104–1112, 2007. Download link

2. **Jana, P.** and Bhaskar, K., Analytical solutions for buckling of simply supported rectangular plates due to non-linearly distributed in-plane bending stresses, ***Structural Engineering and Mechanics***, 26(2), 151–162, 2007. Download link

1. **Jana, P.** and Bhaskar, K., Stability analysis of simply supported rectangular plates under non-uniform uniaxial compression using approximate plane stress solution, ***Thin-Walled Structures***, 44, 507–516, 2006. Download link

Edited Volumes

2. Maiti D. K., **Jana, P.** , Mistry C. S., Ghoshal R. , Afzal M. S., Patra P. K., Maity D., ***Recent Advances in Computational and Experimental Mechanics- Vol II***, Published by: Springer, 2022. Download link

1. Maity D., Patra P. K., Afzal M. S., Ghoshal R. , Mistry C. S., **Jana, P.** , Maiti D. K., ***Recent Advances in Computational and Experimental Mechanics- Vol I***, Published by: Springer, 2021. Download link

Book Chapters

3. Das S., **Jana, P.**, Analytical solution for buckling of rectangular plate subjected to non-uniform uniaxial compression using FSDT, ***Recent Advances in Computational and Experimental Mechanics- Vol II***, Published by: Springer, 2022

2. Kumar R., **Jana, P.**, Dynamic stiffness method for free vibration analysis of stepped plate using the first-order shear deformation theory, ***Recent Advances in Computational and Experimental Mechanics-Vol II***, Published by: Springer, 2022

1. Jayswal S., **Jana, P.**, Stress behavior of an elasto-plastic ellipsoidal inhomogeneity embedded in an elastic matrix under sinusoidal loading, ***Recent Advances in Computational and Experimental Mechanics-Vol II***, Published by: Springer, 2022

Conference Publications

16. Kumar R., **Jana, P.**, Modal analysis of pre-stressed rectangular plate using the dynamic stiffness method, Proceedings of ICSV-29, 2023.

15. Kumar R., Chaudhary KN., **Jana, P.**, Free vibration analysis of functionally graded plate with arbitrarily shaped cutout, Proceedings of ICSV-29, 2023.

14. Adithya T., **Jana, P.**, Buckling analysis of corrugated sandwich structures: a RVE based multi-scale approach, 6th International Conference on Structural Integrity and Durability - ICSID 2022, Dubrovnik, Croatia, 2022.

13. Das S., **Jana, P.**, Analytical Solution for Buckling of Functionally Graded Sandwich Plate Subjected to Parabolically Varying Edge Load, 8th Asian Conference on Mechanics of Functional Materials Structure 2022, Guwahati, Assam, India. 2022.

12. Saha S., **Jana, P.**, Optimization of open-section columns for maximum buckling load using Genetic Algorithm technique, International Conference on Aviation Technology-Current Scenario, Kolkata, India, 2020.

11. Kumar R., **Jana, P.**, Dynamic stiffness method applied for free vibration analysis of a stepped FGM plate using shear deformation theory, International Conference on Aviation Technology-Current Scenario, Kolkata, India, 2020.

10. Choudhary P. K., Mahato P. K., **Jana, P.**, Optimal location of cutout within a cross-ply laminated cantilever beam for maximum lateral buckling load, *Journal of Physics: Conference Series*, 1240 012084, 2019.

9. Kumar S., **Jana, P.**, Free vibration analysis of thin E-FGM plates resting on elastic foundation by using the Dynamic Stiffness Method, 7th ECCOMAS Thematic Conference on the Mechanical Response of Composites: COMPOSITES 2019, Girona, Spain, 2019.

8. Choudhary, P.K., **Jana, P.**, Location optimization of circular cutout within a simply supported orthotropic rectangular plate for maximum buckling load, Conference proceedings: *International Conference on Composite Materials and Structures (ICCMS)*, IIT Hyderabad, 2017.

7. **Jana, P.**, Elastic-plastic behavior of an ellipsoidal inclusion embedded in an elastic matrix, Conference proceedings: *11th International Symposium on Plasticity and Impact Mechanics (IMPLAST)*, IIT Delhi, 2016.

6. Biswas, S., **Jana, P.**, Chatterjee, A., Frictional hysteresis in an elastic body with microcracks, Conference proceedings: *Sixth International Congress on Computational Mechanics and Simulation (ICCMS)*, IIT Bombay, 885-888, 2016.

5. **Jana, P.**, Chatterjee, A., Power-law damping from dispersed elasto-plastic flaws with Weibull-distributed strengths, Conference proceedings: *17th U.S. National Congress on Theoretical and Applied Mechanics*, Michigan State University, Michigan, USA, 2014.

4. **Jana, P.**, Chatterjee, A., Modal damping prediction for vibrating solids: constitutive models and finite element computations, Conference poster: *Nonlinear Dynamics in Engineering: Modelling, Analysis and Applications*, University of Aberdeen, Scotland, UK, 2013.

3. **Jana, P.**, Chatterjee, A., Frictional dissipation at a small crack under multiaxial periodic stresses, Conference proceedings: *15th National Conference on Machines and Mechanisms (NaCoMM)*, IIT Madras, 232–239, 2011.

2. **Jana, P.**, Bhaskar, K., Buckling of rectangular plates under non-uniform compression using rigorous plane stress solution, Conference proceedings: *International Conference on Theoretical, Analytical, Computational and Experimental Mechanics (ICTACEM)*, IIT Kharagpur, 364–366, 2004.

Invited Lecture

5. **Jana, P.**, Structural Analysis using ANSYS and MATLAB Cosimulation, Presented at the "5-Day Faculty Development Program (FDP) on Numerical and Simulation Tools for Research in Mechanical Engineering", VIT-AP University, Amaravati (AP), India, June, 2023.

4. **Jana, P.**, Application of FSDT based dynamic stiffness method for free vibration analysis of sigmoid functionally graded rectangular stepped plate, Presented at the 8th Asian Conference on Mechanics of Functional Materials Structure, IIT Guwahati, Assam, India, December 2022.

3. **Jana, P.**, Optimal design of thin walled plate/shell structures for maximum buckling load. Presented at the AICTE-ATAL workshop on Multi-Disciplinary Design Optimisation in Engineering: Advanced, IIT Kharagpur, February 2022.

2. **Jana, P.**, Buckling and vibration analysis of laminated composite plates. Presented at the Faculty Development Program, Department of Mechanical Engineering of Government College of Engineering, Kalahandi, Orissa, August 27, 2020.

1. **Jana, P.**, Modeling and analysis of composite material using FEM. Presented at the short term course on Mechanics of Composite and Functionally Graded Materials (MCFGM), NIT Durgapur, December 24–28, 2013.

Editor/Associate Editor

Associate Editor: *Noise & Vibration Worldwide*, Published by: SAGE Publications

Peer Review Experience

- Composites Part B: Engineering (Elsevier)
- Mechanics of Materials (Elsevier)
- Computational and Nonlinear Dynamics (ASME)
- Mechanics of Composite Materials (Springer)
- Noise and Vibration Worldwide (SAGE)
- Advances in Mechanical Engineering (SAGE)

Sponsored Research Project (as PI)

- **Project Title:** *Performance improvement of auxetic core based composite sandwich plates: Machine learning-based optimization studies and experimental validation*
  Sponsored: **SERB (DST)- CRG scheme**; Value: 44.147 Lakhs; Duration: 3 years (20 Mar, 2024 - ongoing)
- **Project Title:** *Modeling and Simulation of Bird Impact on PEEK Prepreg Composites and Stretched Acrylate for Aerospace Applications*
  Sponsored: **DMSRDE (DRDO) - CARS mode**; Value: 41.416 Lakhs; Duration: 1.5 years (04 Oct, 2023 - ongoing)
- **Project Title:** *Numerical and Experimental Study of the Damping Characteristics of Composite Structures*
  Sponsored: **IIT Kharagpur - ISIRD scheme**; Value: 28.000 Lakhs; Duration: 3 years (31 Oct, 2019 - 30 Oct, 2022)
- **Project Title:** *Optimal design of thin-walled beam/plate structures for maximum elasto-plastic buckling load*
  Sponsored: **SERB (DST)- ECR scheme**; Value: 20.086 Lakhs; Duration: 3.5 years (20 Sept, 2016 - 19 July, 2020)

Conference Organized

- International Conference on Recent Advances in Computational and Experimental Mechanics, at IIT Kharagpur, Duration: (06-09-2020 to 04-09-2020)

Short Term Course Organized

- Advanced Composites for Practicing Engineers, for employees of TATA Steel Limited (Research Development Division, Jamshedpur, India)
- Analysis and Design of FRP Composite Structures (AICTE-QIP), Duration: (02-09-2019 to 08-09-2019)

Teaching Experience

- **Subjects taught:**
  Applied Elasticity and Plasticity
  Introduction to Aerospace Structures
  Aerospace Structural Analysis
  Finite Element Method
  Composite Structures
  Advance Solid Mechanics
  Continuum Mechanics
  Design of Machine Elements
  Engineering Mechanics
  Engineering Graphics
  Mechanical Engineering Design
  Mechanical Vibration

PhD Students

- **PhD awarded:**
  Dr. Prashant Kumar Chowdhary, Thesis title: Optimal design of thin-walled plate and shell structures for maximum buckling load. Date of thesis defense: 09/08/2022.
  Dr. Subodh Kumar, Thesis title: Free vibration analysis of thin uniform and stepped functionally graded plates using the dynamic stiffness method. Date of thesis defense: 03/08/2020.

- **PhD ongoing:**
  Ms. Sushree Das; Area of research: Development of analytical solution for vibration and buckling analysis of advanced composite structures.
  Mr. Raj Kumar; Area of research: Implementation Dynamic Stiffness Method for Buckling and vibration analysis of advanced composite structures.
  Mr. Bibhu Prasad Mahapatra; Area of research: Vibration and control of composite structures.
  Mr. Gajjala Rahul Reddy; Area of research: Non-linear finite element analysis of composite sandwich plate structures.
  Mr. Leeladhar Rajput; Area of research: Dynamic analysis of nano composite structures

Date last updated: April 15, 2024