

Curriculum Vitae

Prasun Jana

Assistant Professor

Department of Aerospace Engineering
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Research Interests

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

Education

<i>Qualification</i>	<i>Department</i>	<i>Institute</i>
PhD	Mechanical Engineering	IIT Kharagpur
MS	Aerospace Engineering	IIT Madras
BE	Mechanical Engineering	IEST, Shibpur

Employment

<i>Organization</i>	<i>Position held</i>	<i>Duration</i>
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

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

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, 2nd International Conference on New Frontiers in Engineering, Science & Technology, Kurukshetra, India, 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.**, Optimal location of cutout within a cross-ply laminated cantilever beam for maximum lateral buckling load, *Journal of Physics: Conference Series*, 1240 012084, 2019.
7. 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.
6. **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.
5. 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.
4. **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.
3. **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.
2. **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.
1. **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

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)
- Noise and Vibration Worldwide (SAGE)
- Advances in Mechanical Engineering (SAGE)

Sponsored Research Project (as PI)

- **Project Title:** *Optimal design of thin-walled beam/plate structures for maximum elasto-plastic buckling load*
Sponsored: **SERB (DST)**; Value: 20.086 Lakhs; Duration: 3.5 years (start date- 06 Sept, 2016)
- **Project Title:** *Numerical and Experimental Study of the Damping Characteristics of Composite Structures*
Sponsored: **IIT Kharagpur**; Value: 28.000 Lakhs; Duration: 3 years (start date- 31 Oct, 2019)

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. Subodh Kumar, Thesis title: Free vibration analysis of thin uniform and stepped functionally graded plates using the dynamic stiffness method.
Dr. Prashant Kumar Chowdhary, Thesis title: Optimal design of thin-walled plate and shell structures for maximum buckling load.
- **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

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