# Dr. Rahul Kumar

Ph. D in Mechanical Engineering, with focused work on structural behaviour of functionally graded plate using radial basis collocation method. Seeking new opportunities, in research organizations and in an academic institution where I can utilize and enrich my skills. Looking to grow as a researcher, as well as boosting my skills in computational mechanics.



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## Profile Summary

• **Ph.D in Mechanical Engineering** at Sardar Vallabhbhai National Institute of Technology, Surat, Gujarat.

(JD

- Work particularly focused on structural behaviour of functionally graded plate, laminated and sandwich plate using radial basis collocation method energy.
- Skilled in bending analysis, buckling analysis, free vibration analysis, new displacement field modelling and implementation of meshfree method.
- Hard working researcher capable of channelling the energy to get fruitful outcome resulting in successful publication of number of journals.

## 💼 Work Experience

- 1) Assistant Professor : Deen Dayal Upadhyaya Gorakhpur University, Gorakhpur Duration: November 2022 Present
- 2) Teaching Assistant: Sardar Vallabhbhai National Institute of Technology, Surat Duration: January 2017 – November 2020 Role:
  - Responsible to assist in Laboratories: Finite Element method and Design of machine.

## **Publications in (SCI/Scopus) Journals**

- 1. **R. Kumar**, BN Singh, J. Singh, J. Singh, "Meshfree approach for flexure analysis of bidirectional porous FG plate subjected to I, L, and T types of transverse loading", *Aerospace Science and Technology*, vol. 129, p. 107824, Oct. 2022
- 2. **R. Kumar**, M. Bajaj, J. Singh, and K. K. Shukla, "New HSDT for Free vibration analysis of elastically supported porous bidirectional functionally graded sandwich plate using collocation method" *Proceedings of the Institution of Mechanical Engineers, Part C*, vol.236, no. 16, pp. 9109–9123, Aug. 2022.
- 3. C. Kumar, **R. Kumar**, H. K. Sharma, and S. Khare, "Simulation and Modelling for Bending Analysis of Elastically Supported Laminated Plates Under Concentrated Load: A Meshless Approach," *Int J Steel Struct*, vol. 23, no. 4, pp. 1091–1104, Aug. 2023
- 4. **R. Kumar**, B. N. Singh, and J. Singh, "Geometrically nonlinear analysis for flexure response of FGM plate under patch load", *Mechanics Based Design of Structures and Machines*, 2022(Accepted)
- 5. **R. Kumar**, J. Damania, J. Singh ,J. Singh, "A Meshfree Approach for Bending Analysis of Porous Rectangular FGM Plate Resting on Elastic Foundation", *Mechanics of advanced composite structures*, vol. 9, no. 2, pp. 303–316, Nov. 2022
- 6. **Rahul Kumar**, Jigyasa Singh, Jay Damania, Jeeoot Singh, "Assessment of Radial basis function based meshfree method for the buckling analysis of rectangular FGM plate using

- HSDT and Strong form formulation", *Journal of Computational Applied Mechanics*, vol. 53, no. 3, pp. 332–347, Sep. 2022
- 7. **R. Kumar**, A. Jain, M. Singh, J. Singh and J. Singh, "Porosity dependent buckling analysis of elastically supported FGM sandwich plate via new tangent HSDT: A meshfree approach", *International Journal of Computational Materials Science and Engineering*, vol. 12, no. 01, p. 2250013, Mar. 2023
- 8. **Rahul Kumar**, Karan K Gupta, Jigyasa Singh and Jeeoot Singh, 'Radial basis collocation method for free vibration analysis of elastically supported porous bi-directional FGM plate under various types of porosity distribution", *Advances in Materials and Processing Technologies*, vol. 9, no. 2, pp. 368–390, Apr. 2023
- 9. Dilshukh, Sumit Khare, Akhilesh Malguri, **Rahul Kumar**, "Numerical Investigation on Free Vibration Response of Bi-Directional Porous Functionally Graded Circular/Annular Plates", *Mechanics of advanced composite structures*, vol. 9, no. 2, pp. 243–262, Nov. 2022
- 10. **R. Kumar**, A. Lal, B. N. Singh, and J. Singh, "Flexural response of porous FGM plate under patch load," *Acta mechanica (Accepted)*
- 11.**R. Kumar**, and Sumit Khare, "Effect of uniform and nonuniform porosity on free vibration of functionally graded circular plate", *International Journal of Computational Materials Science and Engineering*, Vol 11, pp 225001, 2022
- 12.**R. Kumar**, A. Lal, B. N. Singh and J. Singh, "Numerical simulation of the thermomechanical buckling analysis of bidirectional porous functionally graded plate using Collocation meshfree method", *Proceedings of the Institution of Mechanical Engineers*, *Part L*, vol. 236, pp. 787-807, 2022
- 13.**R. Kumar**, A. Lal, B. N. Singh, and J. Singh, "Non-linear analysis of porous elastically supported FGM plate under various loading" *Composite Structure*, vol. 233, pp. 111721,2020
- 14.**R. Kumar**, A. Lal, B. N. Singh, and J. Singh, "Meshfree approach on buckling and free vibration analysis of porous FGM plate with proposed IHHSDT resting on the foundation", *Curved and Layered Structures*, vol. 6,pp 192–211, 2019
- 15.Jeeoot Singh, **Rahul Kumar**, Vivekanand Shukla, "Bending analysis of laminated plate via polynomial RBF Journal of Physics" Conference Series, vol. 1172(1), pp-012109 ,2019
- 16.R. Kumar, A. Lal, B. N. Singh, and J. Singh, "New transverse shear deformation theory for bending analysis of FGM plate under patch load", *Composite Structures*, vol. 208, pp. 91–100,2019
- 17.R. Kumar and J. Singh, "Assessment of higher order transverse shear deformation theories for modeling and buckling analysis of FGM plates using RBF based meshless approach," *Multidiscipline Modeling in Materials and Structures*, vol. 14, pp. 891-907, 2018
- 18.M. K. Solanki, R. Kumar, and J. Singh," Flexure Analysis of Laminated Plates Using Multiquadratic RBF Based Meshfree Method International Journal of Computational Methods, vol. 15, pp. 1850049, 2018
- 19.A Kumar, **R Kumar**, J Damania, J Singh, "Buckling Analysis of FGM Plates by thin plate spline RBF based Meshfree Approach", IOP Conference Series: *Materials Science and Engineering*, vol. 404, pp. 012037, 2018.

## **International Conferences**

- **R. Kumar**, A. Lal, and J. Singh. Meshfree Approach for the Vibration Analysis of FGM plates using Two Shear Displacement Model. Indian conference on applied mechanics, Jul 2017, MNNIT, Allahabad
- A Kumar, J Damania, **R. Kumar**, and J. Singh. Buckling Analysis of FGM Plates by thin plate spline RBF based Meshfree Approach. 1st International Conference on Contemporary

Research in Mechanical Engineering with Focus on Materials and Manufacturing, 6–7 April 2018, Lucknow, India

- **R. Kumar**, A. Lal, B. N. Singh, and J. Singh., Bending response of elastically supported FGM plate using MQ-RBF method under patch load. International Conference on Energy, Environment & Material Sciences, December 2019, MMMUT, Gorakhpur
- J. Singh, **R. Kumar**, and V. Shukla. Bending analysis of laminated plate via polynomial RBF. International Conference on Applied Physics, Power and Material Science 5–6 December 2018, Telangana, India
- A Lal, Nand Kanu, **R Kumar**., Mixed mode stress intensity of edge crack laminated composite plate in hygrothermal environment using XFEM. Indian conference on applied mechanics, Jul 2017, MNNIT, Allahabad

## **Books**

R. Kumar and J. Singh, Challenges for Analysis of FGM Plates: A Meshfree Approach: Computational Challenges Beyond FEM, LAP LAMBERT Academic Publishing, 23-Aug-2016

#### **Area of Interest**

- Computational mechanics
- Mechanical modelling of laminated, sandwich and FGM plate using radial basis function
- Linear and nonlinear bending, buckling and vibration of FGM, laminated and sandwich plate
- Radial basis function based meshfree method

#### Section Section

	Sardar Vallabhbhai National Institute of Technology, Surat
Ph.D	2021 (Full Time Research Scholar) **
	Supervisors:
	1. Dr. B. N. Singh, Professor Department of Aerospace Engineering, IIT
	Kharagpur
	2. Dr. Achchhe Lal, Assistant Professor, Department of Mechanical
	Engineering, SVNIT, Surat
	Birla Institute of Technology, Mesra
M.E	2016 (Department of Mechanical Engineering)
	Supervisors:
	1. Dr. Jeeoot Singh, Professor, MMMUT Gorakhpur
	2. Dr D. Mahto, Assistant Professor, BIT Mesra
	Percentage =85.3%
	Rajasthan Technical University
B. Tech	2012 (Mechanical Engineering)
	Percentage =65.3%

**\*\*Thesis Title:** Structural behaviour of functionally graded plate using radial basis collocation method.

Program	Title to Ph.D. Thesis	Institution	Date of	Date of	Date of
_			Registration	Submission	Award

Ph.D.	STRUCTURAL BEHAVIOUR OF	SVNIT	2017-01-02	2020-11-05	2021-06-08
	FUNCTIONALLY GRADED	Surat			
	PLATE USING RADIAL BASIS				
	COLLOCATION METHOD				

#### **References**

Referee	Designation	Institutional Affiliation	Email-ID
Name			
Prof. B. N.	Vice Chancellor	Indian Institute of Technology,	bnsingh@aero.iitkgp.ac.in
Singh	of (RGNAU)	Kharagpur	
Prof. Jeeoot	Professor	Madan Mohan Malaviya	jsme@mmmut.ac.in
Singh		University of Technology,	
		Gorakhpur	
Prof. K.K	Director, MANIT	MANIT Bhopal	kkshukla@mnnit.ac.in
Shukla	Bhopal		

### **Achievements**

- Won 3 times 1<sup>st</sup> prizes in Chess at Inter Collegiate Chess Tournament
- Won many prizes in chess, badminton carom at collage levels
- Completed youth camp for mountaineering and trekking.

## **Personal Profile**

- Father's Name
- : Vijay Verma : Single
- Marital StatusPermanent Address
- : Dr. Rahul Kumar
  - S/O Vijay Verma, Anand Bazar Shiv Mandir Road,

Danapur Cantt Patna Bihar 801503