



# Dr. Tania Bose

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## Ph.D. Thesis

Title *Mathematical modeling of steady state creep in thermally graded rotating disc of  $AlSiC_p$  composite*

## Education

- 2014–2018 **Ph.D. in Mathematics**, *Centre for Advanced Study in Mathematics, Panjab University, Chandigarh.*
- 2003–2005 **M.Sc.(Honours School) in Mathematics**, *Centre for Advanced Study in Mathematics, Panjab University, Chandigarh.*
- 2000–2003 **B.Sc.(Honours School) in Mathematics**, *Centre for Advanced Study in Mathematics, Panjab University, Chandigarh.*
- 2000 **10+2**, *Govt. Model Senior Secondary School, Sec-16, Chandigarh.*
- 1998 **10**, *Carmel Convent School, Sector - 9, Chandigarh.*

## Professional Education

- 2008–2010 **Masters in Education**, *University School of Open Learning, Panjab University, Chandigarh.*
- 2005–2006 **Bachelors of Education**, *Punjabi University, Patiala.*

## Experience

### Research

April, 2014–July, 2018 **Ph.D.**, *Centre for Advanced Study in Mathematics, Panjab University, Chandigarh.*

- 18 May–4 July 2011 **Summer Faculty Research Fellow Programme–2011**, Indian Institute of Technology, Delhi.  
Submitted a Research Report on *A comparison of various methods of Interpolation* under the supervision of **Dr. Mani Mehra**, Associate Professor, Department of Mathematics, IIT Delhi.
- Teaching**
- 2019–till date **Associate Professor.**  
Chitkara University, Punjab.
- 2018 **Guest Lecturer.**  
University Institute of Engineering and Technology, Panjab University, Chandigarh.
- 2014 **Research Scholar.**  
University Institute of Engineering and Technology, Panjab University, Chandigarh.
- 2010–2014 **Assistant Professor in Mathematics.**  
Chitkara University, Punjab.
- 2006–2010 **Lecturer in Mathematics.**  
G.G.S. College of Modern Technology, Kharar, Punjab.

## Awards

- June 2012 Qualified **CSIR–JRF (NET)** with rank 72/305 in Mathematical Sciences.
- 2014–2016 **Junior Research Fellowship** (Council of Scientific & Industrial Research).
- 2016–2018 **Senior Research Fellowship** (Council of Scientific & Industrial Research).
- March 2016 **Best Oral Presentation Award** in Chandigarh Science Congress.
- Sep 2016 **Research Award** for recognition of publishing research paper titled “Steady state creep behavior of thermally graded isotropic rotating disc of composite taking into account the thermal residual stress” in SCI/SCIE indexed *European Journal of Mechanics-A/Solids* for the year 2016 by University Institute of Engineering and Technology, Panjab University, Chandigarh, INDIA.
- May 2018 **Research Award** for recognition of publishing research paper titled “Effect of thermal gradation on steady state creep of functionally graded rotating disc” in SCI/SCIE indexed *European Journal of Mechanics-A/Solids* for the year 2017 by University Institute of Engineering and Technology, Panjab University, Chandigarh, INDIA.

## Research Publications

### SCI Journals

- 2018 **Bose, T. and Rattan, M.**, Modeling creep analysis of thermally graded anisotropic rotating composite disc, *International Journal of Applied Mechanics*. Vol. **10(6)**, pp.1850063(1-15) (World Scientific), **IMPACT FACTOR: 2.449**.
- 2018 **Bose, T. and Rattan, M.**, Effect of thermal gradation on steady state creep of functionally graded rotating disc, *European Journal of Mechanics A/Solids*. Vol. **67**, pp.169-176 (Elsevier), **IMPACT FACTOR: 3.786**.

- 2017 **Bose, T., Rattan, M. and Chamoli, N.**, Steady state creep of isotropic rotating composite disc under thermal gradation, *International Journal of Applied Mechanics*. Vol. **9(6)**, pp.1750077(1-20) (World Scientific), **IMPACT FACTOR: 2.449**.
- 2017 **Bose, T. and Rattan, M.**, Modeling creep behavior of thermally graded rotating disc of functionally graded material, *Differential Equations and Dynamical Systems*. DOI 10.1007/s12591-017-0350-1 (Springer), **IMPACT FACTOR: 0.74**.
- 2016 **Rattan, M., Kaushik, A., Chamoli, N. and Bose, T.**, Steady state creep behavior of thermally graded isotropic rotating disc of composite taking into account the thermal residual stress, *European Journal of Mechanics A/Solids*. Vol. **60**, pp.315-326 (Elsevier), **IMPACT FACTOR: 3.786**.

### Scopus Indexed Journals

- 2021 **Tania Bose, Neeraj Chamoli, Minto Rattan and Kunjan Gupta**, Effect of anisotropy on creep of rotating functionally graded disc with varying thickness, *IOP Conference Series: Materials Science and Engineering*. Vol. **1033**, pp.012061(1-12)
- 2021 **Tania Bose, Kunjan Gupta, Minto Rattan and Neeraj Chamoli**, Study of thermal gradation on creep deformation of non-linear varying functionally graded rotating disc, *IOP Conference Series: Materials Science and Engineering*. Vol. **1033**, pp.012084(1-9)

### Conference Proceedings

- 2017 **Bose, T., Rattan, M. and Chamoli, N.**, Modeling the effect of thermal gradation on steady-state creep behavior of isotropic rotating disc made of functionally graded material, *International Journal of Mechanical, Aerospace, Industrial, Mechatronic and Manufacturing Engineering*, Vol.11(5), pp.1106-1111.
- 2017 **Rattan, M., Bose, T. and Chamoli, N.**, Effect of linear thermal gradient on steady-state creep behavior of isotropic rotating disc, *International Journal of Mechanical, Aerospace, Industrial, Mechatronic and Manufacturing Engineering*, Vol.11(5), pp.978-984.
- 2016 **Bose, T., Rattan, M. and Chamoli, N.**, Creep analysis of an isotropic linearly decreasing functionally graded rotating disc at linearly increasing temperature, *International Journal of Applied Science-Research and Review*, Vol.3(1), pp.122-129.

### Patents Filed

- 2020 **Bose, T.**, Smart Clutch Tootkpick, *Filing Number: 334844-001*, filed on Nov 03, 2020.
- 2020 **Kakkar, M.K., Bhatti, J. and Bose, T.**, Door Handle, *Filing Number: TEMP/E-1/59944/2020-DEL*, filed on Dec 12, 2020.

### Papers presented in Conference

- March 2009 **ICT in Education**, Seminar on Challenges, Practices and Experiments: Distance Education, University School of Open Learning, Panjab University, Chandigarh.

- May 2010 **Mathematics Education: Demanding Change**, International Conference on Education Informatics, Chitkara Institute of Engineering and Technology, Punjab, PP, Paper Id: 0076, Pg 77-79.
- March 2011 **A Study into Transportation Problems**, National Seminar on Role of Mathematics in Scientific Research, Government College, Sec 1, Panchkula.
- Dec 2011 **Practical Approach of Operation Research in Healthcare Sector**, National Conference on Recent Trends in Mathematics and its Applications (RTMA- 11), Sant Longowal Institute of Engineering and Technology, Longowal, Punjab, OP, Paper Id: OP 17, Pg 27.
- April 2012 **Attitude of Students towards Mathematics**, EDUCON 2012, 1st World Conference of GERA on Shaping a Future Classroom: A Global Perspective, Lovely Professional University, Punjab, DP, Paper Id: 341.
- July 2012 **A Survey of Operation Research Applications in Healthcare**, National Conference on Mathematical Modelling, Simulation and Optimization (MMSO-2012), Chitkara University, Punjab, OP, Paper Id: 28.
- Dec 2012 **Mathematics Education for Engineers in the changing World**, National Seminar on Mathematics and its Applications (NSMA-2012), Punjabi University, Patiala.
- Oct 2013 **Mathematical Aspects of Material Sciences**, International Conference on Information & Mathematical Sciences (IMS-13), Baba Farid College of Engineering and Technology, Bathinda, PP, Paper Id: 17.
- Nov 2015 **Creep analysis of an isotropic linearly increasing functionally graded rotating disc at linearly increasing temperature**, Annual Research Day CYNOSURE-2015, IIT, Ropar, PP, Paper Id: 61.
- Feb 2016 **Creep analysis of an isotropic linearly decreasing functionally graded rotating disc at linearly increasing temperature**, National Conference on New Advances in Mathematics, D.A.V. College, Yamuna Nagar, OP, Paper Id: O-AB-0102-184.
- Feb 2016 **Creep analysis of an isotropic parabolically decreasing functionally graded rotating disc at linearly decreasing temperature**, National Conference on Role of Mathematics and Computer Science in Advancement of Physics, Govt. Degree College, Kathua, J&K, PP, Paper Id: 63.
- March 2016 **Creep analysis of an isotropic linearly decreasing functionally graded rotating disc at linearly increasing temperature in the presence of residual stress**, CHASCON-2016, Panjab University, Chandigarh, OP, Paper Id: 17.
- Dec 2016 **Effect of linearly decreasing temperature on steady-state creep analysis of isotropic rotating disc**, International Conference on Recent Advances in Theoretical & Computational Partial Differential Equations with Applications, Panjab University, Chandigarh, OP, Paper Id: 136.
- March 2017 **Analysis of effect of stress exponent on steady-state creep in anisotropic rotating disc**, CHASCON-2017, Panjab University, Chandigarh, OP, Paper Id: 10.
- Nov 2017 **A study on the effect of linearly decreasing temperature on creep analysis of anisotropic rotating composite disc**, 2<sup>nd</sup> National Conference on Role of Mathematics and Computer Science in Advancement of Physics, Govt. Degree College, Kathua, J & K, OP.

Sep 2020 **Investigation into steady state of AISiC cylinder on account of residual stress with internal and external pressure**, National Conference on Advances in Applied Sciences and Mathematics (NCASM-20), Chitkara University, Punjab, OP, Paper Id: 52.

## Workshops/ Webinars attended

1. **Climate Change Primer**, at Indian Habitat Center, New- Delhi, held from Oct 30-31, 2009, organized by CMS Environment.
2. **Vedic Mathematics**, at Chitkara Institute of Engineering & Technology, Punjab, held from Nov 1-2, 2010.
3. **Advanced Numerical Analysis Using MATLAB (ANAUM-2010)**, at Chitkara Institute of Engineering & Technology, Punjab, held from Nov 13-14, 2010.
4. **Designing & Setting MCQs**, at Chitkara University, Punjab, held on Jan 13, 2011.
5. **IUCEE sponsored Workshop on ABET Accreditation Process**, at Chitkara University, Himachal Pradesh, held from Feb 6-8, 2012.
6. **Faculty Development Workshop on Operational Research**, at Chitkara University, Punjab, held from June 18-22, 2012.
7. **Faculty Development Workshop on Designing MCQs on Higher Mathematics**, at Chitkara University, Punjab, held from June 25-29, 2012.
8. **National level Faculty Development Workshop on Numerical Analysis using C++**, at Chitkara University, Punjab, held from July 2-6, 2012.
9. **Faculty Development Workshop on Graphs of Functions and Inequalities**, at Department of Mathematics, Chitkara University, Himachal Pradesh, held on July 29, 2012.
10. **National Workshop on Latex**, at Department of Mathematics, Chitkara University, Punjab, held from July 8-10, 2013.
11. **Mathematical Modeling and Computational Techniques**, at Department of Mathematics, Panjab University, Chandigarh, held from September 27-28, 2013.
12. **Patent Hands-on-Training**, at School of Applied Sciences, Chitkara University, Chandigarh, held on January 25, 2014.
13. **Conservation Laws with Applications to Continuum Mechanics**, at Department of Mathematics, Panjab University, Chandigarh, held from December 2-7, 2014.
14. **Applications of Statistical Tools in Research**, at Chitkara University, Punjab, held on February 26, 2019.
15. **Applications of MATLAB in Research**, at Chitkara University, Punjab, held on April 8, 2019.
16. **Introduction to Fuzzy Logic and it's Applications**, at Chitkara University, Punjab, held on December 17, 2019.
17. **Optimization Techniques: An Introduction with Applications**, held online by Chitkara University, Punjab, from June 12-13, 2020.

18. **Covid 19: Boon or Curse**, held online by Chitkara University, Punjab, on June 14, 2020.
19. **Water Sanitation, Hygiene and Waste Management for the Covid-19 viruses**, held online by Chitkara University, Punjab, from June 15-16, 2020.
20. **The Essential Attributes and Professional Responsibilities of an Engineer for Society**, held online by Department of Applied Sciences, JIET Group of Institutions, JIET University Mogra, Jodhpur, on June 10, 2020.
21. **Fuzzy Linear Programming Problems and Its Applications in Science and Engineering**, held online by Chitkara University, Punjab, from June 17-18, 2020.
22. **One Day National Level Online Technical Workshop on MATLAB for beginners**, held online by Department of Mathematics, Government Arts and Science College, Thennangur, Tamil Nadu, on June 20, 2020.
23. **Basic Maths Workshop-BMW**, held online by Department of Applied Sciences, Chitkara University, Baddi, from June 11-20, 2020.
24. **Community and Research**, held online by Department of Applied Sciences, Chitkara University, Punjab, from June 17-18, 2020.
25. **Intellectual Property Rights**, held online by Sengunthar College of Engineering, Tiruchengode, Namakkal, Tamil Nadu, on July 3, 2020.
26. **Numerical Analysis: An Introduction with Applications**, held online by Department of Applied Sciences, Chitkara University, Punjab, on July 9, 2020.
27. **National Level Quiz on Engineering Mathematics**, held online by Department of Applied Sciences, Chitkara University, Himachal Pradesh, from July 11-12, 2020.
28. **Fractional Calculus and Applications**, held online by Department of Applied Sciences, Chitkara University, Punjab, on July 21, 2020.
29. **Workshop on Free Tools and Flipped Classrooms for Effective Teaching and Learning**, held online by Department of Applied Sciences, Chitkara University, Punjab, from July 27-31, 2020.
30. **Workshop on Mathematica for Beginners (A Technical Computing System)**, held online by Department of Applied Sciences, Chitkara University, Punjab, from August 17-19, 2020.
31. **Workshop on "Introduction to Mathematica - Basic Training with Hands on Session"**, held online by Department of Applied Sciences, Chitkara University, Punjab, on September 03, 2020.
32. **National Workshop on Some Recent Tools in Analysis under Research**, held online by Department of Applied Sciences, Chitkara University, Punjab, from October 05-10, 2020.
33. **Real Life Optimization Problems**, held online by Dr. B.R. Ambedkar National Institute of Technology, Jalandhar, on October 17, 2020.
34. **An Overview of Some Influential Emerging Technologies of 2020**, held online by Department of Applied Sciences, Chitkara University, Punjab, from December 07-11, 2020.

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## Symposia & Conference attended

1. **National Conference of AIAER on Higher Education and National Development**, organized by Jasdev Singh Sandhu College of Education, Patiala, held from May 5-6, 2006.
2. **13<sup>th</sup> Punjab Science Congress**, organized by Panjab University, Chandigarh, held from Feb 7-9, 2010.
3. **9<sup>th</sup> Chandigarh Science Congress CHASCON-2015**, held at Panjab University, Chandigarh, from Feb 25-27, 2015.
4. **National Conference on Optimization Modelling and Machine Learning Techniques**, organized at Department of Mathematics, Panjab University, Chandigarh, from March 20-21, 2015.

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## Short Term Course/Faculty Development Programme attended

1. **UGC-sponsored Short Term Course for PhD./M.Phil. Research Scholars**, organized by UGC-Human Resource Development Centre, Panjab University, Chandigarh, held from Oct 28-Nov 11, 2015.
2. **One Week Faculty Development Program on A Look into the Future**, held at Dr. S. S. Bhatnagar University Institute of Chemical Engineering & Technology, Panjab University, Chandigarh, from October 24-29, 2016.
3. **FDP on Online Teaching Learning Practices: Challenges and Solutions**, held at Department of Mathematics and Computer Sciences, Sri Guru Teg Bahadur Khalsa College, Sri Anandpur Sahib, from July 9-13, 2020.
3. **Journey from Research to Publication - JRP-20**, held at Department of Applied Sciences, Chitkara University, Punjab, from July 13-27, 2020.

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## Chapters in Book

1. **Chapter-Creep Analysis of Anisotropic Functionally Graded Rotating Disc Subject to Thermal Gradation**, in *Materials Physics and Chemistry, Applied Mathematics and Chemo-Mechanical Analysis*, ISBN:9781771888677, published by Apple Academic Press, 2020.
2. **Chapter-Vector Calculus**, in *Engineering Mathematics-I*, ISBN:978-93-82782-06-3, published by Chitkara University Publications, 2013.
3. **Chapter-Fourier Series**, in *Engineering Mathematics-II*, ISBN:978-93-82782-01-8, published by Chitkara University Publications, 2013.
4. **Chapter-Numerical Solutions of Partial Differential Equations**, in *Advanced Numerical Analysis*, ISBN:978-81-920249-1-2, published by Chitkara University Publications, 2012.

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## Resource Person/Organiser

1. **National Science Day**, organized by Department of Applied Sciences, Chitkara University, Punjab, held on February 15, 2019.

2. **Workshop on 'Writing Research paper in  $\text{\LaTeX}$** , in *Five Days National Workshop on "Innovative Techniques of Characterization, Optimization and Data Analysis(ITCOD)"*, organized by Department of Applied Sciences, Chitkara University, Punjab, held from July 8-12, 2019.
3. **Workshop on 'Getting started with  $\text{\LaTeX}$** , in *Five Days National Workshop on "Art of Writing: A Permeable for Thesis and Research paper(AWTRP-19)"*, organized by Department of Applied Sciences, Chitkara University, Punjab, held from December 18-22, 2019.
4. **Workshop on 'Hands on with  $\text{\LaTeX}$** , in *"National Hands on Workshop on Characterization Techniques and Nanomaterials Applications"*, organized by Department of Applied Sciences, Chitkara University, Punjab, held from January 20-25, 2020.
5. **Expert Talk on 'A Concise Talk on Vedic Mathematics and Logical Reasoning'**, organized by Department of Applied Sciences, Chitkara University, Punjab, held on January 30, 2020.
6. **Five-Days Live Online Workshop On MATLAB: AN INTRODUCTION WITH APPLICATIONS**, organized by Department of Applied Sciences, Chitkara University, Punjab, held from April 14-18, 2020.
7. **Live Online FDP on LATEX: An art of Writing Research Manuscript**, organized by Department of Applied Sciences, Chitkara University, Punjab, held from April 23-26, 2020.
8. **Live Online Webinar on Maths is everywhere: An Essential Part of Our Lives**, organized by Department of Applied Sciences, Chitkara University, Punjab, held on July 02, 2020.
9. **Delivered talk on 'An Insight into Research Methodology(Theoretical Approach)'**, in *Journey from Research to Publication JRP-20*, organized by Department of Applied Sciences, Chitkara University, Punjab, held on July 17, 2020.
10. **Quiz Fiesta**, organized by Department of Applied Sciences, Chitkara University, Punjab, held on November 28, 2020.
11. **Expert Talk on 'Mathematics: Building Block of Life'**, in *National Mathematics Day*, organized by Department of Applied Sciences, Chitkara University, Punjab, held on November 28, 2020.