

# CURRICULUM VITAE

## Dr. Rangoli Goyal

Assistant Professor, Mathematics

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## TEACHING EXPERIENCE

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1. **Assistant Teaching Professor, Mathematics** at Mills College, Northeastern University (Sept'2023 – Present)

- Teaching Calculus 2 and Calculus for Business and Economics in Fall'23 semester.
- Leading and mentoring readers to conduct discussion sessions and grading activities.
- Assigning students HW, lab work, journal critique activity as well as mentored them to implement a Business Project. Conducting class activities and student presentation after every lesson review.
- Participating in Faculty meetings and Collaboration activities with peer teachers.

**Adjunct Faculty, Mathematics** at Mills College, Northeastern University (Sept'2022 – Apr' 2023)

- Taught courses Calculus 1, Calculus 3 and Differential Equations and Linear Algebra in Spring 2023.
- Taught course MTH1100: College Algebra in Fall 2022.

2. **Instructor, Mathematics** at UC Berkeley Extension Campus, California (Aug'2023 – Present)

- Teaching Calculus 1A at FPF program.
- Leading and mentoring readers to conduct discussion sessions and grading activities.

3. **Independent Mathematics Tutor – Wyzant Inc. (Sept' 21 – Present).**

- Courses taught - Algebra 1, Algebra 2, Geometry, Pre-Calculus, AP Calculus AB & BC, Graph Theory, Calculus II, Multivariable Calculus, Differential Equations, Linear Algebra, Discrete Mathematics & SAT/ACT preparation.
- Collaborated with students to complete homework assignments, identify lagging skills, and correct weaknesses.
- Planned lessons for the allotted time to strengthen weak subjects and build skills.

4. **Assistant Professor** at G.D.Goneka University, Gurgaon, India (Aug' 2018 – Feb'20).

- Courses taught: Algebra, Mathematics for Economists, Calculus for Engineers, Multi-variable Calculus, Differential Equations, Discrete Mathematics, Mechanics, Mathematical Physics.
- Took attendance, graded assignments, and maintained student records along with assisting with administrative tasks and maintaining smooth daily operations.
- Applied innovative teaching methods to encourage student learning objectives.
- Revised course objectives, course materials, and instructional and assessment strategies for undergraduate and postgraduate mathematics courses.
- KVPY (Kishore Vaigyanik Protsahan Yojana) Ambassador for University. KVPY is a scholarship programme funded by the Department of Science and Technology of the Government of India. Conducted lectures to help students gain relevant life skills for better job prospects.

## ACADEMIC RECORDS

DEGREE	UNIVERSITY	YEAR	PERCENTAGE/ CGPA
Ph.D. Mathematics  Fulbright Nehru Doctoral Fellowship 2016-2017	Indian Institute of Technology, Roorkee, (IIT Roorkee) Uttarakhand, India.  University of California, Riverside, USA	July 2013- Apr 2018  Sept 2016 – May 2017	-
Master of Science (Mathematics & Scientific Computing)	MotiLal Nehru National Institute of Technology, Allahabad, India.	2011-2013	(9.4/10 CGPA)  (Gold Medallist)
Bachelor of Science [B.Sc. (Hons.)] (Mathematics)	Banasthali University, Rajasthan, India.	2008-2011	78%, First Division

## PUBLICATIONS PROFILE (Total citations – 92, h-index – 7)

1. Makkar V., Poply V., **Goyal R.**, Sharma N., (2021) Numerical investigation of MHD Casson nanofluid flow towards a nonlinear stretching sheet in presence of double-diffusive effects along with viscous and ohmic dissipation, *Journal of Thermal Engineering* ;7(2):pp1-7.
2. Makkar V., Poply V., **Goyal R.**, Sharma N., (2021) Analysis of Velocity, Thermal and Concentration MHD Slip Flow over a Non-Linear Stretching Cylinder in presence of Outer Velocity, *Heat Transfer (Wiley)*, 50(2) pp: 1-27.
3. **Goyal R.**, Makkar V., Sharma N., Bhargava R., (2021) GFEM analysis of MHD nanofluid flow toward a power-law stretching sheet in the presence of thermodiffusive effect along with regression investigation, *Heat Transfer (Wiley)*, 50(1) pp: 234-256.
4. **Goyal R.**, Bhargava R., (2018) FEM simulation of EM field effect on body tissues with bio-nanofluid(blood with nanoparticles) for nanoparticle mediated hyperthermia, *Mathematical Biosciences*, 300, pg. 76-86.
5. **Goyal R.**, Vafai K., (2017) Electromagnetic field-induced thermal management of biological materials, *Numerical Heat Transfer, Part A*, vol. 72(4).
6. **Goyal R.**, Bhargava R. (2017) Meshfree simulation of thermodiffusion effects in a nanofluid filled triangular enclosure with slanting wavy wall with application to greenhouse solar collector, *International Journal of Applied and Computational Mathematics (Springer)*, Vol. 3(1), pp 243-259.
7. Goyal M., **Goyal R.**, Bhargava R. (2017) FEM simulation of triple diffusive natural convection along inclined plate in porous medium: Prescribed surface heat, solute and nanoparticles flux, *International Journal of Applied Mechanics and Engineering*, 2017, vol.22, No.4, pp.883-90.
8. **Goyal R.**, Goyal M., Bhargava R. (2017) FEM simulation of thermo-diffusion effects on MHD flow of nanofluid over an exponentially stretching sheet with application to extrusion, *Computational Methods in Thermal-Fluid Systems - Computational Method Algorithms*, pg 2389-2401, DOI: 10.1615/TFEC2017.cma.017752
9. **Goyal R.**, Bhargava R. (2016) EFGM Simulation of Pulsating Double diffusive Effect on Transpiration Cooling in Nanofluid Filled Wavy Channel, *International Journal of Applied and Computational Mathematics (Springer)*. 3(3), 1847-1860
10. Bhargava R., **Goyal R.** (2014) Some Advanced Finite Element Techniques for the Problems of Mechanics: A Review, *Mathematical Analysis and its Applications (Springer)*, pp 715-728.

## CONFERENCE/SEMINARS ATTENDED

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### Technical:

1. Poster presentation on ‘Simulation of phase change during freezing of irregular tumor tissue’ at Indian Women in Mathematics workshop at NISER Bhubaneswar, India, October 27-28, 2018.
2. Paper presentation at ‘2nd Thermal and Fluids Engineering Conference and 4th International Workshop on Heat Transfer’, Nevada on ‘FEM simulation of thermo-diffusion effects on MHD flow of nanofluid over an exponentially stretching sheet with application to extrusion’, April 2-5, 2017.
3. Paper presentation at ‘ICMSCMA 2016’, Zurich, Switzerland on ‘FEM Simulation of Triple Diffusive Magnetohydrodynamics Effect of Nanofluid Flow over a Nonlinear Stretching Sheet’, September 15-16, 2016. Awarded the **best paper award**. Published in International Journal of Mathematical, Computational, Physical, Electrical and Computer Engineering, 10(9), pp 427-434.
4. Paper presentation at ‘IRCTMAA-2014’, I.I.T. Roorkee on ‘Some Advanced Finite Element Techniques for the Problems of Mechanics: A Review’, December 21-23, 2014.
5. Attended the National Workshop ‘Optimization Techniques and their Applications’ (NWOTA-2013) during June 5-11, 2013 at MNNIT, Allahabad.
6. Attended the National Conference ‘Advances in Mathematical Sciences’ during October 5-7, 2012 at MNNIT, Allahabad.

### Non-technical:

1. Presented a paper on ‘**Gender disparity in STEM**’ at Fulbright Association’s 39th Annual Conference, November 10-13, 2016, in Washington, D.C, USA.

## INVITED TALK

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1. Delivered an invited talk on ‘Numerical Simulation of Some Problems in Mechanics Using Advanced FE Techniques’, August 31, 2018 at TIFR Centre for Applicable Mathematics (TIFR-CAM), Bangalore, India.
2. Invited to speak at the Fulbright seminar – ‘Perceptions of the United States abroad’ at University of California, Los Angeles on April 19, 2017.

## RESEARCH/OUTREACH GRANTS

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1. Awarded 2019-2020 Fulbright-Nehru Alumni Award for proposal - “Implementation of Fruit Peel Cleaner in Delhi NCR and Visakhapatnam” by United States-India Educational Foundation (USIEF). Grant amount – INR 50,000.

## AWARDS AND HONORS

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1. Awarded Fulbright Nehru Doctoral Fellowship 2016-2017.
2. Qualified GATE-2013.
3. Gold medallist in Masters of Sciences (Mathematics and Scientific Computing) at MNNIT, Allahabad.
4. Awarded INSPIRE fellowship by Department of Science and Technology (DST), Government of India, New Delhi for pursuing doctoral studies.
5. Awarded MHRD fellowship by Government of India, New Delhi for pursuing doctoral studies.

6. Rank third in Bachelors of Sciences (Mathematics Hons.) at Banasthali University, Rajasthan.
7. Received a scholarship by D.A.V. Public School for excellent performance in class 10<sup>th</sup>.

## RESEARCH TRAINING

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1. Invited to attend the KAREMA (Kaiserslautern Research Meeting) programme at Kaiserslautern, Germany from December 02 – 10, 2017, funded by DFG (German Research Foundation).
2. Attended the fully-funded CIMPA research school on ‘Introduction to the mathematical analysis of differential equations and real-life applications’ in Vientiane, Laos from January 3 -13, 2017.
3. Attended a short-term course on ‘Meshfree Methods’ under GIAN (*Global Initiative of Academic Networks*) at the National Institute of Technology, Patna from 21.12.2015 to 25.12.2015. Lectures by Prof. G.R. Liu, University of Cincinnati, USA.
4. Attended ‘Postgraduate Level Training Programme’ under NPDE-TCA (National Program on Differential Equations: Theory, Computation and Applications) at Indian Institute of Technology, Kanpur from 18.05.2015 to 04.06.2015.
5. Worked on ‘Classification of groups up to order 25 and Representation Theory’ as a part of Master’s dissertation at MotiLal Nehru National Institute of Technology (MNNIT), Allahabad.
6. Part of the ‘Number theory Year – 2011’ at Institute of Mathematical Sciences (IMSc), Chennai. Attended lectures on transcendental number theory.
7. Selected for summer training at Harish Chandra Research Institute, Allahabad, India for two summers, 2010 & 2011.
8. Successfully completed the project related to Chandrayaan (Orbital stimulation and its MATLAB coding) as a part of an internship undertaken at Mathematical Sciences Foundation, New Delhi in summer – 2009.

## VOLUNTEER WORK

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1. **Gender Facilitator: People for Parity, New Delhi, India, May’ 2013 – July’2016**  
I worked as a volunteer gender facilitator, educating youth of age group (12 – 25) years and assisting local government institutions to tackle and prevent gender-based discrimination and sexual harassment.
2. Presented a paper on ‘**Gender disparity in STEM**’ at Fulbright Association’s 39th Annual Conference, November 10-13, 2016, in Washington, D.C, USA.
3. **Member of Senate Committee 2014-2015 at I.I.T. Roorkee**  
I worked towards improving the security of the campus and extending the girls' hostel time by an hour. Elected as the mess secretary of the girls' hostel, I worked towards improving the quality of food being provided in hostels.
4. Member of the editorial board of the university magazine ‘SRIJAN’ at Banasthali University, Rajasthan from 2009-2011.