



Contact Details:	
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Teaching Experience: 13 years & 06 Months

Courses Taught:

(i) Under Graduate and Post Graduate students:

Linear Algebra, Real Analysis, Discrete Mathematics, Ordinary and Partial Differential equations, Numerical Analysis, Fractional Differential Equations, Finite Element Analysis, Mathematical Methods.

(ii) Ph.D. Students:

Advanced Mathematical Methods, Group Analysis of Differential Equations, Hydrodynamic Stability Theory.

Fields of Interest: Fluid Dynamics, Numerical Analysis, Differential Equations

Research Area: Boundary layer theory, numerical methods, Fractional Calculus

List of Research Papers Published/Accepted:

1. **Rakesh Kumar**, Reena Koundal, Sabir Ali Shehzad, Generalized least square homotopy perturbation solution of fractional telegraph equations, **Computational and Applied Mathematics** 38(4) (2019).
2. **Rakesh Kumar**, Reena Koundal, Sabir Ali Shehzad, Least square homotopy solution to hyperbolic telegraph equations: multi-dimension analysis, **Accepted, International Journal of Applied and Computational Mathematics** (2019).
3. Z Abbas, T Mushtaq, SA Shehzad, A Rauf, **R Kumar**, Slip flow of hydromagnetic micropolar nanofluid between two disks with characterization of porous medium, **Journal of the Brazilian Society of Mechanical Sciences and Engineering** 41(10) (2019).
4. Md Faisal Md Basir, **Rakesh Kumar**, Ahmad Izani Md Ismail, G Sarojamma, PV Satya Narayana, Jawad Raza, Asad Mahmood, Exploration of Thermal-Diffusion and Diffusion-Thermal Effects on the Motion of Temperature-Dependent Viscous Fluid Conveying Microorganism, **Arabian Journal for Science and Engineering** 44(9) (2019) 8023-8033.
5. **R Kumar**, S Sood, CSK Raju, SA Shehzad, Hydromagnetic unsteady slip stagnation flow of nanofluid with suspension of mixed bio-convection, **Propulsion and Power Research** (2019) 1-11.
6. **Rakesh Kumar**, Ravinder Kumar, Reena Koundal, Sabir Ali Shehzad, Mohsen Sheikholeslami, Cubic Auto-Catalysis Reactions in Three-Dimensional Nanofluid Flow Considering Viscous and Joule Dissipations Under Thermal Jump, **Communications in**

Theoretical Physics 71(7) (2019) 779-792.

7. **Rakesh Kumar**, Ravinder Kumar, Scrutiny of stagnation region flow in a nanofluid suspended permeable medium due to inconsistent heat source/sink, **arXiv preprint arXiv:1904.01250** (2019).
8. **Rakesh Kumar**, Ravinder Kumar, M Sheikholeslami, Ali J Chamkha, Irreversibility analysis of the three dimensional flow of carbon nanotubes due to nonlinear thermal radiation and quartic chemical reactions, **Journal of Molecular Liquids** 274 (2019) 379-392.
9. M.Sheikholeslami, Sabir Ali Shehzad, **R. Kumar**, Natural Convection of Fe₃O₄-Ethylene glycol under the impact of electric field in a porous enclosure, **Communications in theoretical Physics** 69(6) (2018).
10. **R. Kumar**, Sabir Ali Shehzad, Numerical simulation of three dimensional flow of radiating gray nanofluid through porous medium subjected to vibrational rotations and slip at liquid-sheet interface, **Journal of Porous Media** Accepted (2018).
11. **R. Kumar**, Ravinder Kumar, Sabir Ali Shehzad, M Sheikholeslami, Rotating frame analysis of radiating and reacting ferro-nanofluid considering Joule heating and viscous dissipation, **International Journal of Heat and Mass Transfer** 120 (2018) 540-551.
12. **R. Kumar**, Numerical exploration of thermal radiation and rotation effects on the 3-dimensional flow of Cu-water nanofluid over an oscillating flat surface, **International Journal of Applied and Computational Mathematics**, 4 (2018).
13. **R. Kumar**, C.S.K. Raju, K.R. Sekhar, G.V. Reddy, Three dimensional MHD Ferrous nanofluid flow over a sheet of variable thickness in slip flow regime, **Journal of Mechanics**, 35(2) (2017) 255-266.
14. V. Kumar Joshi, P. Ram, **R. Kumar** C.S.K. Raju, Effect of Geothermal Viscosity on

- Unsteady Bodewadt Flow of Ferro-nanofluid Embedded in Porous Medium, **Journal of Porous Media**, Accepted (2017).
15. K.R. Sekhar, G.V. Reddy, C.S.K. Raju, B. Pullepu, **R. Kumar**, S.A. Shehzad, Aligned magnetic dipole in nonlinear radiative Falkner-Skan flow of Casson fluid over a wedge containing suspension of nanoparticles and microorganisms, **International Journal of Nanoparticles** 9(4) (2017) 213–233.
 16. **R. Kumar**, S. Sood, Unsteady MHD Nanobioconvective Stagnation Slip Flow in a Porous Medium Due to Exponentially Stretching Sheet Containing Microorganisms, In: Singh M., Kushvah B., Seth G., Prakash J. (eds) Applications of Fluid Dynamics, pp. 3–16 **Lecture Notes in Mechanical Engineering**. Springer, DOI https://doi.org/10.1007/978-981-10-5329-0_1
 17. **R. Kumar**, S. Sood, S. A. Shehzad, M. Sheikholeslami, Radiative heat transfer study for flow of non-Newtonian nanofluid past a Riga plate with variable thickness, **Journal of Molecular Liquids** 248 (2017) 143–152.
 18. **R. Kumar**, S. Sood, Combined influence of fluctuations in the temperature and stretching velocity of the sheet on MHD flow of Cu-water nanofluid through rotating porous medium with cubic auto-catalysis chemical reaction, **Journal of Molecular Liquids** 237 (2017) 347–360.
 19. **R. Kumar**, S. Sood, M. Sheikholeslami, S. A. Shehzad, Nonlinear thermal radiation and cubic autocatalysis chemical reaction effects on the flow of stretched nanofluid under rotational oscillations, **Journal of Colloid and Interface Science** 505 (2017) 253–265.
 20. **R. Kumar**, S. Sood, S. A. Shehzad, M. Sheikholeslami, Numerical modeling of time-dependent bio-convective stagnation flow of a nanofluid in slip regime, **Results in Physics**

7 (2017) 3325-3332.

21. **R. Kumar**, S. Sood, Numerical Analysis of Stagnation Point Nonlinear Convection Flow Through Porous Medium over a Shrinking Sheet, **International Journal of Applied and Computational Mathematics** 3(2) (2017) 971-985.
22. P. Ram, H. Singh, **R. Kumar**, V. Kumar, V. K. Joshi, Free Convective Boundary Layer Flow of Radiating and Reacting MHD Fluid Past a Cosinusoidally Fluctuating Heated Plate, **International Journal of Applied and Computational Mathematics** 3(1) (2017) 261-294.
23. **R. Kumar**, S. Sood, Interaction of Magnetic Field and Nonlinear Convection in the Stagnation Point Flow over a Shrinking Sheet, **Journal of Engineering**, Volume 2016, (2016) Article ID 6752520, 8 pages <http://dx.doi.org/10.1155/2016/6752520>
24. **R. Kumar**, S. Sood, Effect of Quadratic density variation on mixed convection stagnation point heat transfer and MHD fluid flow in porous medium towards a permeable shrinking sheet, **Journal of Porous Media**, 19 (12) (2016) 1083-1097.
25. **R. Kumar**, Combined effects of variable magnetic field and porous medium on the flow of MHD fluid due to exponentially shrinking sheet, **International Journal of Mathematical archive** 6(6), (2015) 218-226.
26. K. Chand, **R. Kumar**, S. Kumar, Heat transfer in oscillating hydromagnetic channel flow with arbitrary conducting walls, **Turkish Journal of Engineering and Environmental Sciences** 38 (2014) 256-265.
27. K. Chand, **R. Kumar**, S. Sharma, Rarefaction and Darcy effects on the hydromagnetic flow of radiating and reacting fluid in a vertical channel, **Turkish Journal of Engineering and Environmental Sciences** 37 (2013) 137-145.

28. K. Chand, **R. Kumar**, Hall effect on heat and mass transfer in the flow of oscillating viscoelastic fluid through porous medium with wall slip conditions, **Indian Journal of Pure and Applied Physics** 50 (2012) 149-155.
29. K. Chand, **R. Kumar**, S. Sharma, Hydromagnetic oscillatory flow through a porous medium bounded by two vertical porous plates with heat source and Soret effect, **Advances in Applied Science Research** 3(4) (2012) 2169-2178.
30. **R. Kumar** and K. D. Singh, Mathematical modeling of Soret and Hall effects on oscillatory MHD free convective flow of radiating fluid in a rotating vertical porous channel filled with porous medium, **Int. J. of Appl. Math. & Mech.**, 8 (2012) 49-68.
31. K.D. Singh and **R. Kumar**, Fluctuating Heat and Mass Transfer on Unsteady MHD Free Convection Flow of Radiating and Reacting Fluid past a Vertical Porous Plate in Slip-Flow Regime, **Journal of Applied Fluid Mechanics** 4(4) (2011) 101-106.
32. K. Chand, **R. Kumar**, Soret and Hall current effects on heat and mass transfer in MHD flow of viscoelastic fluid past a porous plate in rotating porous medium and slip flow regime, **Journal of Rajasthan Academy of Physical Sciences** 10(4) (2011) 357-371.
33. **R. Kumar**, K. Chand, Effect of slip conditions and Hall current on unsteady MHD flow of a viscoelastic fluid past an infinite vertical porous plate through porous medium, **International Journal of Engineering Science and Technology** 2011 (2011) 3124-3133.
34. **R. Kumar** and K. D. Singh, Unsteady MHD flow of radiating and reacting fluid past a vertical porous plate with cosinusoidally fluctuating temperature, **Int. J. of Appl. Math. & Mech.**, 7 (2011) 19-35.

35. K. D. Singh and R. Kumar, An exact solution of an oscillatory MHD flow through a porous medium bounded by rotating porous channel in the presence of Hall current, **Int. J. of Appl. Math. & Mech.**, 6, (2010) 28-40.
36. K.D. Singh R. Kumar, Effects of chemical reactions on unsteady MHD free convection and mass transfer for flow past a hot vertical porous plate with heat generation/absorption through porous medium, **Indian Journal of Physics** 84 (1) (2010) 93-106.
37. K.D. Singh, R. Kumar, Soret and Hall Current Effects on Heat and Mass Transfer in MHD Flow of a Viscous Fluid through Porous Medium with Variable Suction, **Proceedings-Indian National Science Academy Part A, Physical Sciences** 75(3) (2009) 119-126.
38. K.D. Singh, R. Kumar, Heat and Mass Transfer in MHD flow of a viscous fluid through porous medium with variable suction and heat source, **Proceedings-Indian National Science Academy Part A, Physical Sciences** 75(1) (2009) 7-13.
39. K.D. Singh, R. Kumar, Combined effects of Hall current and rotation on free convection MHD flow in a porous medium, **Indian Journal of Pure and Applied Physics** 47 (2009) 617-623.
40. K.D. Singh, R. Kumar, Radiation effects on the exact solution of free convective oscillatory flow through porous medium in a rotating vertical porous channel, **Journal of Rajasthan Academy of Physical Sciences** 8(3) (2009) 295-310.

Number of Papers Presented in National/International Conferences: 16

Conferences/Seminars/Workshop organised:

1. Three days workshop on “**Two faces of Analysis**” from April 21st to April 23rd , 2014 organised by Mathematical Society of CUHP.
2. One Week workshop on “**Analytical Aspects of Dynamics**” from November 11th to November 17th, 2014 organised by Mathematical Society of CUHP.
3. Two days workshop on “**Sobolev spaces**” from February 27th to February 28th , 2015 organised by Mathematical Society of CUHP.
4. One day workshop on “**Recent Trends in Continuum Mechanics**”, 18th May, 2015 organised by Mathematical Society of CUHP.
5. Two days Workshop on “**Indian Mathematics**” from 13 September to 14 September 2019 organised by Mathematical Society of CUHP.
6. Two days National Seminar on “**Analytical Aspects of Dynamics**” from 22 November to 23 November 2019 organised by Mathematical Society of CUHP.

Invited Talks/Lectures:

- | Sr.No. | Title /Theme/Institute |
|---------------|--|
| 1. | Mathematics- an interesting and useful discipline , DST INSPIRE INTERNSHIP CAMP , Department of Microbiology, College of Basic Sciences, CSK HP Krishi Vishvavidalaya, Palampur, HP, 22-26 October 2013 |
| 2. | Recent Trends in Mathematics , A Programme on Career Opportunities and Recent Trends in Mathematics , M&M Educational Services, Hamirpur HP, 1 February 2014 |
| 3. | Importance of Mathematics-I , DST INTERNSHIP SCIENCE CAMP , |

Laureate Institute of Pharmacy, Kathog, Jwalaji HP, 4-8 July 2016

4. Importance of Mathematics-II , **DST INTERNSHIP SCIENCE CAMP**,
Laureate Institute of Pharmacy, Kathog, Jwalaji HP, 19-23 December 2016
5. Importance of Mathematics-III , **DST INTERNSHIP SCIENCE CAMP**,
Laureate Institute of Pharmacy, Kathog, Jwalaji HP, 14 October 2019

Research Guidance:

S. No.	Degree	Name of Student	Title of thesis	Awarded/ Ongoing
1.	Ph. D.	Shilpa Sood	Some steady and unsteady convective boundary layer flows past deforming surfaces	Awarded 2017
2.	Ph. D.	Ravinder Kumar	Analysis of some three dimensional nanofluid flows inside boundary layer	Ongoing
3.	Ph. D.	Reena Koundal	Some analytical and numerical methods for solutions to fractional differential equations	Ongoing
4	Ph.D.	Tanya Sharma	Yet to be decided	Ongoing

Research Projects:

S. No.	Title / Subject of Research Project	Name of Sponsoring Funding Agency	Date of commencement	Date of Completion	Total Grants/ Funding Sanctioned
1.	Oscillatory Convection in Nanofluids	UGC BSR Start-Up grant vide UGC letter No. F.30-64/2014	18.02.2015	17.02.2017	6,00,000

Development of E-Learning Delivery Process/ Material:

S. No.	Name of Subject	Name of Module
1.	Fractional Differential Equations	OER in Moodle

Awards & Honours Received:

S. No.	Name of Award
1.	Gold Medal in M.A./M.Sc. Examination, 2003 from HP University Shimla
2.	Himo-Utkarsh Sahitya Academy Award for being topper in M.A./M.Sc. Examination, 2003
3.	Shyama Prasad Mukherjee Fellowship call for being among top 20% JRF awardees in June 2004