Curriculum Vitae



Dr. Rohit Kumar

Qualification- B.Tech (Mechanical Engg.), ME (Thermal Engg.),
PhD, IIT Roorkee
PDF, IIT Bombay

Email- rkumar5@me.iitr.ac.in
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EDUCATIONAL QUALIFICATION

Degree	Certificate Institution / Board	Year	Percentage
High School	H.P.B.S.E	2006	83.1
Higher Secondary	H.P.B.S.E	2008	75.8
B.Tech (Mechanical)	MMEC, Mullana	2012	76.3
M.E (Thermal)	Thapar University, Patiala	2015	86.5
Ph.D (Thermal)	IIT Roorkee (Indian Institute of Technology Roorkee)	2021	94.2
PDF (Research Scientist)	IIT Bombay	Nov. 2022 to 16th Aug. 2023	
Project Associate	IIT Mandi	17th Aug. 2023 onwards	

TECHNICAL SKILLS

CFD & Simulation Expertise

- Strong hands-on experience with **ANSYS CFD** for fluid flow and heat transfer analysis.
- Proficient in **ANSYS ICEM CFD** for generating high-quality structured and unstructured meshes for complex geometries.
- Experience with **Fluidyn NSI** for numerical simulation of fluid flow and air pollution.

- Skilled in complete CFD workflow: **geometry preparation, meshing, solver setup, convergence control, and post-processing**.

CAD & Design Integration

- Expertise in **SolidWorks** and **PRO-E (Creo)** for 3D modeling and design optimization.
- Working experience with **AutoCAD 2011 (2D & 3D)** for engineering drawings and layouts.

TRAINING

- **Sonalika Tractor LTD**
  Six-week Industrial Training at Sonalika Tractor Ltd, Hoshiarpur
- **International Cars & Motors LTD**
  Six-week industrial training at International Cars & Motors Ltd.
- Basics and Applications of CFD in August-2013 at Thapar University, Patiala.
- Hands on Training on CFD in October-2013 at Thapar University, Patiala.

PROJECTS

- **Investigation on Hydrogen Generation from a PHWR Disassembled Channel**
  (SPONSORING AGENCY: **BRNS**; Amount: 48.18 Lakh; Status: Completed;
  PI: Dr. Manish Mishra, Professor IIT Roorkee)
- **Heat up and Quenching Studies of PHWR Specific Debris Experiments for PHWR**
  (SPONSORING AGENCY: **BARC**; Amount: 8.41 Lakh; Status: Completed;
  PI: Dr. Manish Mishra, Professor IIT Roorkee)
- **CFD Simulation of a deformed reactor channel under heat up condition**
  (SPONSORING AGENCY: **BARC**; Amount: 14.95 Lakh; Status: Completed;
  PI: Dr. Manish Mishra, Professor IIT Roorkee)
- **Automated vertical car parking**, which park the vehicle according to time and weight basis automatically

THESIS TOPICS

- **ME thesis topic:** An Investigation into power losses of manual power transmission system using different viscosity oils and nanoparticles

- **Ph.D thesis topic:** Investigations on PHWR disassembled fuel channel during severe accident condition
- **PDF topic:** Smoke Tower Project at Connaught Place

AWARDS AND HONOUR

- **Merit certificate** in matriculation examination by Himachal Pradesh Board of School Education Dharamshala.
- GATE qualified in 2013 and 2014.
- Prize of Rs. 10000 for good academic performance in 2006.
- Prize of Rs. 6000 continuously three years for good academic performance in 2009-2011.
- Got certificate of merit during technical model exhibition held at March, 2010 in MMEC.
- Got certificate of honor as a member of organizing committee in Mechanical Tech Fest held at March 2011.
- Rs. 8000 TA Scholarship per month from AICTE in 2013-2015.
- Got certificate of honor as a member of organizing committee RSD 2018, IIT Roorkee.
- Got certificate of honor to participate in Poster Presentation in RSD 2018 and 2019, IIT Roorkee.
- Got certificate of appreciation in organizing the 25th National and 3rd International ISHMT-ASTEF Heat and Mass Transfer Conference held during 2019 at IIT Roorkee, India.

PUBLICATIONS

Refereed Journal

- **Kumar, R.,** Mishra, M., Gokhale, O. and Mukhopadhyay, D., 2021. Experimental and numerical study of 19-pin disassembled fuel channel under severe accident condition. *Nuclear Engineering and Design*, 380, pp. 111278. https://doi.org/10.1016/j.nucengdes.2021.111278
- **Kumar, R.,** Mishra, M., Gokhale, O. and Mukhopadhyay, D., 2021. Thermo-chemical behavior of PHWR disassembled channel during severe accident condition: Numerical and experimental investigation. *Annals of Nuclear Energy*, 160, pp. 108733.

https://doi.org/10.1016/j.anucene.2021.108733

- Kaur, G., Kainth, S., **Kumar, R.**, Sharma, P. and Pandey, O.P., 2021. Reaction kinetics during non-isothermal solid-state synthesis of boron trioxide via boric acid dehydration. *Reaction Kinetics, Mechanisms and Catalysis*, 134, pp.347-359. https://doi.org/10.1007/s11144-021-02084-8

- Patel, S., **Kumar, R**. and Kumar, P., 2024. Interaction of a Taylor bubble with the liquid–liquid interface in a notched tube. *Physics of Fluids*, 36(12). https://doi.org/10.1063/5.0242337

- Patel, S., **Kumar, R.,** Kumar, P., 2024. Thermo-hydrodynamics of a condensing Taylor bubble in a vertical tube filled with subcooled liquid. *Physics of Fluids*, 36(12). https://doi.org/10.1063/5.0244157

- Nawale, P., Sahu, M., Parikh, R., **Kumar, R.,** 2026. Performance Evaluation of Air Cleaner Filter for Ultra-Fine Particle Penetration: An Air Filtration Application. *Aerosol and Air Quality Research*. https://doi.org/10.1007/s44408-025-00070-6

- Singh, I., **Kumar, R.,** Kumar, P., Dhar, A., 2026. Low-Temperature Engine Coolant Based Organic Rankine Cycle for Variable Heat Loads. *Journal of Energy Resources Technology, Part A: Sustainable and Renewable Energy (ASME)*. 2(042101).

- Patel, M.S., **Kumar, R.,** Kumar, P., 2026. Unveiling Shear-thinning Droplet Behavior on a Superhydrophobic Surface having Cylindrical Pillar. *Physics of Fluids* 38, 042104. https://doi: 10.1063/5.0320334

- **Kumar, R.,** Tomar, S. S., Rohilla, L., Nag, S., and Kumar P., 2026. Layered Contact Line Freezing Phenomenon for Droplet Impact on a Cold Inclined Substrate. *Applied Thermal Engineering*. Under review.

- Mayank, **Kumar, R.,** Kumar, P., 2026. Interaction of an impacting cylinder with the free surface of a deep liquid pool. Physical Review Fluids. Under review.

Refereed International Conferences in India

- **Kumar, R.,** Mishra, M., Sahoo, P.K., Gokhale, O. and Mukhopadhyay, D., CFD Analysis of Post-Blowdown Thermal Behavior of a 19-Pin Fuel Bundle, Proceedings of the 24th National and 2nd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2017), pp. 507-511.
  DOI: 10.1615/IHMTC-2017.690
- **Kumar, R.,** Mishra, M., Sahoo, P.K., Gokhale, O. and Mukhopadhyay, D., Post-Test Analysis on the Nuclear Fuel Bundle with and without the Effect of

Deformation on the Pressure Tube. 45th National and 7th International Fluid Mechanics and Fluid Power Conference (2018)

- **Kumar, R.,** Kumar, P. and Mishra, M., Thermal Behaviour of the Coolant for Different Sub-channels Arrangements of the Nuclear Fuel Bundle, 45th National and 7th International Fluid Mechanics and Fluid Power Conference (2018).
- **Kumar, R.,** Mishra, M., Sahoo, P.K., Post-Blowdown CFD Simulation of 37-Pin Fuel Bundle, 25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2019).
- **Kumar, R.,** Mishra, M., Sahoo, P.K., Gokhale, O. and Mukhopadhyay, D., Thermal Behavior of a PHWR Terminal Debris during Quenching with Moderator, 25th National and 3rd International ISHMT-ASTFE Heat and Mass Transfer Conference (IHMTC-2019).
- **Kumar, R.,** Tomar, S. S., Nag, S., and Kumar P., Freezing Dynamics of Water Droplet on Cold Hydrophilic Surface. FMFP 2024.

Refereed International Conferences outside India

- **Kumar, R.,** Mishra, M., Sahoo, P.K., Gokhale, O. and Mukhopadhyay, D., Thermal and flow behavior of coolant through 19-pin fuel bundle with special emphasis on eccentricity, Proceedings of the 25th IIR International Congress of Refrigeration: Montreal, Canada, August 24-30, 2019.
  DOI: 10.188462/iir.icr.2019.910
- **Kumar, R.,** Tomar, S. S., Nag, S., and Kumar P., Effects of surface inclination on the freezing dynamics of water droplets on cold hydrophilic substrates. ICMF 2025. **Accepted**

EXTRA CURRICULAR ACTIVITIES

- **Sports coordinator** of badminton games organized during Azad Bhawan day 2016, 2017 and 2018, IIT Roorkee.
- **First position** in Men's Doubles in badminton tournament held at Azad Bhawan day 2016, IIT Roorkee.
- **Second position** in Men's Doubles in badminton tournament held at Azad Bhawan day 2017, IIT Roorkee.
- **Second position** in Men's Doubles in badminton tournament held at Azad Bhawan day 2018, IIT Roorkee.
- **First position** in football tournament held at Azad Bhawan day 2017, IIT Roorkee.
- **Second position** in volleyball tournament held at Azad Bhawan day 2018, IIT Roorkee.

- **Second position** in cricket tournament held at Azad Bhawan day 2017 and 2018, IIT Roorkee.

TEACHING PLAN AND FIELD OF INTEREST

Comfortable in teaching any subjects related to thermal Engineering and others important subjects such as

- Heat transfer
- Thermodynamics
- Refrigeration and air Conditioning
- Fluid mechanics/machines
- Computational fluid dynamics
- Internal combustion engine
- Strength of Material
- Dynamics/Theory of machines

RESEARCH PLAN

Wish to continue work in the field of **Nuclear Reactor Safety System and Environment Pollution study**. Work include

- Numerical work over the Zr-steam reaction to generate hydrogen during severe accident condition.
- Numerical work over nuclear reactor to simulate effect of LOCA condition.
- Boiling and quenching process during accident.
- Experimental/numerical, design, optimization and exergy analysis in heat exchangers.
- Effect of different nanoparticles, different ribs and slits in heat exchanger to enhance its effectiveness and performance.

PERSONAL DETAILS

Name:	Rohit Kumar
Date of Birth:	15 April 1991
Marital Status:	Married
Nationality:	Indian
Languages:	English, Hindi, Punjabi

DECLARATION

I hereby declare that the above information is correct to the best of my knowledge.

Date (Rohit Kumar)

Place