

# Curriculum Vitae

**Dr. Rajesh Katiyar**



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## Academic Qualifications:

<b>BE (Chemical Engg.)</b>	<b>Shivaji University</b>	1991	I Division with distinction (III rank in University)
<b>M. Tech. (Process Engg. &amp; Design)</b>	<b>IIT Delhi</b>	2001	8.058 CGPA
<b>Ph.D.</b>	<b>IIT Delhi</b>	2015	

**Details of service at HBTI/HBTU (Chemical Engineering Department)**

**Associate Professor since 10-10-2008**

**Professor since 30-11-2017**

**Head of Department – Served for 3-year tenure from 15-02-2020 to 14-02-2023**

Served as **Acting Director of Rajkiya Engineering College (REC), Pratapgarh** as per UP Govt. Order No- 1339/16-1-2023 dated 25<sup>th</sup> May 2023, up to **17<sup>th</sup> October, 2023**

**Process Industry experience**

Around 4 years experience in the areas of **Process Operations, Project Engineering and Application Engineering.**

Areas in which worked/received training-

- 1) Ethylene Glycol and Ethylene Oxide derivatives
- 2) Specialty lubricants as per tribological needs and anticorrosion products

**Research areas/ interest**

**Particle processing, composite materials, natural product extraction, biomass utilization and process development.**

**Interaction with external organizations during PhD**

CIMAP (CSIR Lab)

FFDC

Gogia Chemical Industries (P) Ltd.

During PhD at IIT Delhi, worked on the minor projects in the areas of:

- 1) Study on extraction of bamboo fibers for utilization in composites
- 2) Study on efficient process for essential oil extraction

**M Tech research supervised**

Twelve students have completed their M Tech so far.

Specific areas of work have been:

- Epoxy resin/ Furfuryl alcohol/ Furan resin-based polymer concrete

- Polysulfide rubber manufacturing process and application in sealants
- Modeling and application areas of conical fluidized bed
- Use of micro and nano additives in binders for application in composites
- Extraction of essential oil from *Mentha piperita* and its yield and quality analysis
- Treatment and reuse of leather industry wastewater
- Pyrolysis and co-pyrolysis studies of biomass and specific waste materials

## **Courses taught**

### **UG**

Process Design and Economics  
Plant Design and Project Engineering  
Equipment Design  
Bio System Process  
Separation Processes  
Chemical Process Safety and Risk Analysis  
Fluid Flow  
Mechanical Operations  
Heat Transfer Operations  
Mass transfer Operations

### **PG**

Design of Chemical Process Plant Piping System  
Advanced Separation Processes  
Advanced Chemical Engineering Thermodynamics  
Statistical Design of Experiments  
Safety, Hazard and Risk Analysis

## **Associations with**

Institution of Engineers, India  
Vigyan Bharti, India  
Administrative Staff College of India, Hyderabad  
IICHE

## **Publications**

- 1) Co-pyrolysis of pine-cone and chicken feathers: a study to determine kinetic parameters, thermodynamic properties, and potential synergistic effects, *Energy Sources, Part A: Recovery, Utilization, and Environmental Effects*, Volume 46, 2024 - Issue 1  
(<https://doi.org/10.1080/15567036.2023.2291447>)
- 2) A comprehensive review on synthesis and application of nanocomposites for adsorption of chromium: status and future prospective, *Applied Water Science*, (2024) 14:11  
(<https://doi.org/10.1007/s13201-023-02062-6>)
- 3) A multi-objective model for optimizing hydrogen injected-high pressure natural gas pipeline networks, *International Journal of Hydrogen Energy*, 48(76), September, 2023  
(<https://doi.org/10.1016/j.ijhydene.2023.04.133>)
- 4) Thermal and microwave-absorbing properties of doped polyaniline-epoxy nanocomposites for stealth applications, *Journal of Materials Research*, August, 2023  
(<https://doi.org/10.1557/s43578-023-01125-3>)
- 5) Structural design of radar absorber using glass fiber-epoxy composites loaded with BaU hexaferrite for defence applications, *Composite Interfaces*, February, 2023  
(<https://doi.org/10.1080/09276440.2023.2179252>)
- 6) Development of a predictive model for determining mechanical properties of nano Al<sub>2</sub>O<sub>3</sub> reinforced adhesive bonded SS304 single lap joint, *Journal of Polymer & Composites*, 10 (3), 2022
- 7) Electro-oxidation of tannery wastewater to achieve zero discharge – a step towards sustainability, *Environmental Technology*, March, 2022  
(<https://doi.org/10.1080/09593330.2022.2049887>)
- 8) Gums and Waxes, *Leather Age*, August, 2021, 8-10
- 9) Thermal kinetic and thermodynamic study of co-pyrolysis of pine needles and Styrofoam using thermogravimetric analysis, *Energy*, 218, March, 2021, 119404-431  
(<https://doi.org/10.1016/j.energy.2020.119404>)
- 10) Microwave water distillation device, Patent Application Number 202111011376, 19 March 2021(Publication date)

- 11) Dielectric and radar-absorbing properties of exfoliated graphite dispersed epoxy composites, *Journal of Electronic Materials*, 49, April, 2020, 3972–3981 (<https://doi.org/10.1007/s11664-020-08118-6>)
- 12) Study on the application of nano additives for engineering properties enhancement of bonded metal substrate, *International Journal for Research in Applied Science Engineering Technology*, 7 (X), October, 2019, 139-143 (<http://doi.org/10.22214/ijraset.2019.10023>)
- 13) Novel process for isolation of major bio-polymers from mentha arvensis distilled biomass and saccharification of the isolated cellulose to glucose, *Industrial Crops & Products*, 119, September, 2018, 1-8 (<https://doi.org/10.1016/j.indcrop.2018.03.063>)
- 14) Conical fluidized beds- Case study for gas solid system involving wheat flour and additive, *Int. Research J. in Engg. & Tech.*, 04(11), November, 2017, 1524-1528
- 15) Conical fluidized beds- Case study for gas solid system involving coarse particles, *Int. Research J. in Engg. & Tech.*, 04(10), October, 2017, 864-869
- 16) Modeling and simulation of *Mentha arvensis* L. essential oil extraction by water-steam distillation process, *Int. Research J. in Engg. & Tech.*, 04(06), June, 2017, 2793-2798
- 17) Studies on engineering properties of binders loaded with nano-fillers for better designed composites, *Int. J. of Research in Engg. & Tech.*, 06(05), May, 2017, 41-45 (<https://doi.org/10.15623/ijret.2017.0605008>)
- 18) Studies on Furan Polymer Concrete, *Int. Research J. in Engg. & Tech.*, 04(05), May, 2017, 721-727
- 19) Epoxy resin and furan resin-based polymer concrete – Alternative building construction material, *CRSYS*, 25-27 September, 2004, 193-198
- 20) Application of dyes on leather, *Journal of Indian Leather Technologists' Association*, October, 2003, 853-857

## **Conference papers**

- 1) Evaluation of kinetic and thermodynamic parameters of pinecone and chicken feathers keratin using pyrolysis and co-pyrolysis, International Conference on Technological Interventions for Sustainability, 14-16 April, 2022, MNNIT Allahabad, Prayagraj
- 2) Thermodynamic and kinetic study of pyrolysis and co-pyrolysis of sugarcane bagasse and smoked cigarette butts: A review, International Conference on Technological Interventions for Sustainability, 14-16 April, 2022, MNNIT Allahabad, Prayagraj
- 3) Valorization of tannery waste through pyrolysis: A review, National Conference on Advances in Chemical Engineering and Science (ACES-2022), 25-26 March, 2022, IISER Bhopal and UEC, Ujjain
- 4) Production of useful chemicals and fuels from co-pyrolysis of waste Biomass and Plastic: A Review, National Conference on Advances in Chemical Engineering and Science (ACES-2022), 25-26 March, 2022, IISER Bhopal and UEC, Ujjain
- 5) Removal of Chromium from Tannery Composite Wastewater using Electro-Coagulation, 2<sup>nd</sup> International Conference on Chemical Bio & Environmental Engineering, 20-22, August, 2021, NIT, Jalandhar
- 6) Electrochemical Treatment of Tannery Pre-Effluent Treatment Plant (PETP) Wastewater and its reuse, 2<sup>nd</sup> International Conference on Chemical Bio & Environmental Engineering, 20-22, August, 2021, NIT, Jalandhar
- 7) Pilot-Scale Treatment and Reuse of Leather Industry Wastewater by Electrochemical Techniques, 2<sup>nd</sup> International Conference on Emerging Trends in Science, Engineering and Management (ICETSEM, 2021), 15-16 July, 2021, GMIT, Davangere, Karnataka and IFERP (Awarded as best research paper presentation)
- 8) A sustainable Pre-Effluent Treatment of Tannery Wastewater by Electro-Coagulation, 2<sup>nd</sup> International Conference on Emerging Trends in Science, Engineering and Management (ICETSEM, 2021), 15-16 July, 2021, GMIT, Davangere, Karnataka and IFERP
- 9) Environmental Impacts of Automotive Coating Industry and their sustainable solutions: An overview, 2<sup>nd</sup> International Conference on Emerging Trends in Science, Engineering and Management (ICETSEM, 2021), 15-16 July, 2021, GMIT, Davangere, Karnataka and IFERP (Awarded as best research paper presentation)
- 10) Optimization of phosphating process in surface pretreatment, International Conference on Innovations in Smart Technology, Advanced Materials and Communication Engineering (ISTAMCE 2021), 9 June, 2021, Amity School of Engineering and Technology, Amity University, MP, Gwalior
- 11) Optimization of Painting Robots by executing design of experiments, International Conference on Innovations in Smart Technology, Advanced Materials and Communication Engineering (ISTAMCE 2021), 9 June, 2021, Amity School of Engineering and Technology, Amity University, MP, Gwalior (Received certificate of Appreciation)

- 12) Green manufacturing – Reduction of phosphating sludge in coating industry, International Conference on Recent Advances in Design, Material and Manufacturing (ICRADMM 2020), 15-16 Oct, 2020, Amity School of Engineering and Technology, Amity University, MP, Gwalior
- 13) Microwave absorbing applications of exfoliated graphite dispersed epoxy nanocomposites, International Conference on Advanced Nanomaterials, 27-29 Feb, 2020, Rama University, Kanpur (1<sup>st</sup> oral presentation award received by research scholar)
- 14) Polyfurfuryl Alcohol based Polymer Concrete, International Conference on Futuristic Materials and Emerging Trends in Chemical Sciences, 08-10 February, 2016, Deptt. Of Chemistry, DBS College Kanpur, DRDO and DST
- 15) Use and Isolation of *Mentha arvensis* l. oil for its Medicinal Properties, 6th World Ayurveda Congress & Arogya Expo, 07-09 November, 2014, Department of Ayush, MHFW, Govt. of India, New Delhi
- 16) Components and working of Gas Chromatograph in essential oil analysis, National Seminar on New Trends in Green Chemistry, 14-15 December, 2010, Deptt. of Chemistry, DAV College, Kanpur
- 17) Characterisation of *Mentha arvensis* Biomass for Synthesis of Bio-chemicals, 60th Canadian Chemical Engineering Conference, 24-27 October, 2010, University of, Saskatchewan

### **Programs/events organized and interactions**

- 1) Served as Faculty Convener of National Seminar, Interface 2002 being majorly sponsored by ONGC, SIDBI and Vam Organics along with other industry participants
- 2) FDP on **Modern Innovations in Chemical Engineering and Technology**, 09-13 August, 2021 (Jointly organized by Chemical Engineering & Food Technology Departments, HBTU)
- 3) Expert lecture by Ms. Jharna Taneja, Deputy Chief Engineer, NPCIL, Mumbai, on “**The Technology of Nuclear Power Plants**” was organized on 16<sup>th</sup> November, 2021
- 4) Expert Lecture by Mr. Vivek Singh, Senior Project Manager, GE Power India Ltd. on “**Project Management**” was organized on 24<sup>th</sup> November, 2021
- 5) National Webinar on “**Single Use Plastics: Problems, Laws and Alternatives**” was organized on 28<sup>th</sup> August, 2021 (Jointly organized by Plastic Technology & Chemical Engineering Departments, HBTU)
- 6) Under Centenary celebrations of HBTI/HBTU following talks organized:
  - Modeling- An overview with some examples
  - Role of chemical engineer in process industry
  - Bioactive components in aromatic/medicinal herbs & their extraction

- 7) Joint project supervision carried out for M Tech. students along with CSIR Lab Scientist (CLRI, Regional Centre, Kanpur) during 2021, 2022
- 8) Participated and co-chaired the international workshop on “**Advances in water purification & waste water treatment**” jointly organized by Department of chemical engineering, HBTU and Indian Desalination Association (InDA) in association with IChE (KRC), UIET Kanpur (ChED) & AITH Kanpur (ChED), on 18-19 November, 2022.
- 9) Served as Convenor (Organizing team member) for CHEMCON at HBTU, Kanpur during December, 2022.

### **Other assignments carried out**

- 1) Served as member for various committees like guest faculty recruitment and M. Tech., PhD admissions
- 2) Served as Board of Studies Expert Member for Chemical Engineering Department, UIET, CSJMU, Kanpur
- 3) Served as Chairman/Member of BOS Committee of Chemical Engineering and Member for Food Technology departments
- 4) Served as member of BOS Committee for chemical engineering curriculum (review and design) of UG program of UPTU during 2013, 2014
- 5) Participated in assignments of UPPSC in Chemical Engineering areas along with Technical Consultant in Interview Council for Technical Education Department by UPPSC, Prayagraj
- 6) Served as member of the committee for review of the curriculum for chemical technology- Fertilizer, Petrochemical as per NSQF model for IRDT, Department of Technical Education, UP during September, 2019
- 7) Served as committee member for stock verification of Central Library, Supervision committee member for university annual techno-cultural fest, member anti ragging committee and in organizing committees for annual Convocations
- 8) Participated in the activities of election of CSA, sports sub council, UG and PG admission/ registration committees and member scholarship verification committee
- 9) Served as Convener/member of Chemical Engineering Department moderation committee and member for Leather Technology Department
- 10) Served as chairman/member of DPGC
- 11) Served as expert member of evaluation committee (technical evaluation) for technical bids for Automated Surface Preparation and Treatment Plant (on Turn-Key basis) for ALIMCO, Kanpur during 2021
- 12) Served as external expert member in technical staff recruitment for CLRI, Regional Centre, Kanpur



## **FDP/Workshop/MCEP/PDT participations**

- 1) Course on **Air Pollution and its Control**, 11-15 November, 2002, **IIT, Kanpur**
- 2) Refresher course on **Environmental Economics & Environmental Impact Assessment (EIA)**, 26 June- 04 July, 2003, **IIT, Kanpur**
- 3) Short term course on **CAD of Thermal Systems**, 14-19 July, 2003, **IIT, Kanpur**
- 4) SERC School on **Colloids and Interfaces: Fundamentals and Research Challenges**, 07-11 February, 2005, **IIT, Kanpur**
- 5) Course on **Recent Trends in Advanced Composites**, 10-14 October, 2005, **IIT, Kanpur**
- 6) Science Academies' Lecture Workshop on **Advances in Bio-inorganic and Nano Chemistry**, 12-13 November, 2011, DAV (PG) College, Kanpur
- 7) FDP on **Achieving Academic Excellence**, 16-21 November, 2014, **IIM Raipur**
- 8) State Level **Faculty Interaction Seminar** (under the aegis of Department of Technical Education, Govt. of UP), 08-09 June, 2015, HBTI, Kanpur
- 9) Workshop on **Chemical Engineering Curriculum review**, 10-11 June, 2015, CHED, HBTI, Kanpur
- 10) FDP on **Entrepreneurship Development**, 29 Aug - 02 September, 2016, Institute of Entrepreneurship Development, UP and SPFU, UP
- 11) Workshop on **Occupational Health and Safety Management Practices**, 03-05 October, 2016, Engineering Staff College of India
- 12) Program on **Managing Strategic Innovation**, 05-07 December, 2016, **Administrative Staff College of India, Hyderabad**
- 13) Program on **IT Enabled Knowledge Management**, 23-25 January, 2017, **Administrative Staff College of India, Hyderabad**
- 14) Program on **Strategic R&D Management**, 11-13 December, 2017, **Administrative Staff College of India, Hyderabad**
- 15) Workshop on **Outcome based accreditation for undergraduate engineering programs**, 22-23 March, 2018, UPTTI and HBTU, Kanpur
- 16) **Professional Development Training**, 14-18 May, 2018, **IIM Udaipur**
- 17) Summer Training Program on **Active Learning for Senior Faculty**, 11-15 June, 2018, **IIT Kanpur**
- 18) Workshop on **Human Values and Professional Ethics**, July 27-29, 2018, TEQIP III, HBTU, Kanpur
- 19) FDP on **Material Synthesis and Advanced Characterization Techniques**, 01-04 December, 2018, TEQIP-III, HBTU, Kanpur
- 20) **Professional Development Training Programme**, 10-14 February, 2020, **IIM Bodhgaya**
- 21) **Micro-review of program preparedness for NBA Accreditation**, 05 March, 2020, SPIU-UP, Lucknow
- 22) Online training program on **Bioenergy-Technologies & Transitions**, 13-17 May, 2020, NIT Kurukshetra & GEC, Bikaner