

Dr. Chetan M. Patel
Associate Professor
Department of Chemical Engineering
S.V.N.I.T., SURAT



Phone: 0261- 2201647
Mobile: +919825471122
E- Mail: cmp@ched.svnit.ac.in
chetan5158@yahoo.com

Personal Details:

Address: 3-A, Jalpari Apartment, B/H Ambica Niketan Mandir, Parle Point,
Surat – 395007, Gujarat
Date of Birth: 15th September, 1979
Marital Status: Married
Father's Name: Manharlal L. Patel

Educational Qualifications/ Affiliations:

| Degree | Year of Passing | Subject | University/Institution | % Marks |
|----------|-----------------|----------------------------|--|--------------------------------------|
| B.E. | 2001 | Chemical Engineering | South Gujarat University S. V. National Institute of Technology, Surat. (Formerly S. V.R.C.E.T, Surat) | 71.11% 64.85 % (Aggregate) |
| M. Tech. | 2009 | Process Engineering Design | IIT-Delhi | 8.067 CGPA |
| Ph. D. | 2014 | Chemical Engineering | S. V. National Institute of Technology, Surat. | - |

10. Work Experience (in chronological order)

- **Total Teaching Experience: 17 Years 6 months.**
- **Courses Taught:**
 - ❖ Process Calculations, Chemical Engineering Materials (B. Tech. II)
 - ❖ Mechanical Operations, Fluid flow operations, Mass Transfer, Heat Transfer (B. Tech. III)
 - ❖ Process Control (B. Tech. IV); Fertilizer Technology, Fluidization Engineering (Elective Courses B. Tech. IV).
 - ❖ Advanced Transport Phenomena (M. Tech. I)

- Appointed Visiting Faculty twice for **M. Sc. (Industrial Chemistry)** in the **Department of Chemistry, South Gujarat University, Surat.**

| S. No | Position Held | Name of the Institute | From | To | Pay scale |
|-------|---------------------|--|------------|------------|-------------------------|
| 1 | Adhoc-Lecturer | S. V. National Institute of Technology, Surat. | 15-01-2002 | 30-06-2002 | 13,700/- |
| 2 | Adhoc-Lecturer | S. V. National Institute of Technology, Surat. | 22-07-2002 | 30-03-2004 | 13,700/- |
| 3 | Assistant Professor | S. V. National Institute of Technology, Surat. | 01-04-2004 | 05-01-2012 | 15600-39100 AGP-6000 |
| 4 | Assistant Professor | S. V. National Institute of Technology, Surat. | 05-01-2012 | 26-01-2019 | 15600-39100 AGP-7000 |
| 5 | Associate Professor | S. V. National Institute of Technology, Surat. | 27-01-2019 | Till date | 37400-67000 AGP-9500 |

Computer Skills

- ❖ MS Office, Basics of C/ C ++, Aspen plus, MATLAB
- ❖ Statistical software MINITAB, ORIGIN, STATISTICA
- ❖ Artificial neural network (Multiple Back Propagation Software), Genetic algorithm, Excel Solver and Analysis Tool pack, Python.
- ❖ Simulation by Discrete Element Method (DEM) using LIGGGHTS.
- ❖ Molecular Dynamics Simulation by LAMMPS.
- ❖ X-ray line broadening analysis and microstructural analysis: XFIT, WINFIT, BREADTH.

Research areas of interest

- ❖ Nanoparticles production and processing by nanomilling/wet media milling in stirred media mills. (Paints, pigments, inks, pesticides, ceramic materials, pharmaceutical drugs, biomaterials, nanofluids)
- ❖ Liquid phase exfoliation to 2D materials, ultrasonication and sonochemistry.
- ❖ Preparation of Nanostructured materials for lithium ion batteries and Supercapacitors.
- ❖ Stability and rheological characterization of nanosuspension.
- ❖ Characterization and Handling of particulate/powder/bulk solids.
- ❖ Modeling & Simulation of Particulate processes by Discrete element method (DEM)
- ❖ Molecular Simulation of Nanocomposites.
- ❖ Optimization of chemical processes by soft computing techniques. (Use of Statistical design of experiments, Artificial neural network, Genetic algorithm, Multivariate data analysis)

M. Tech. Dissertation Guided:

| Student Name | Title of Dissertation / Project | Year | Remarks |
|-------------------------------|--|-----------|--|
| Jhaveri Jainesh Hareshbhai | Preparation, modification, characterization and application of polymeric membranes for anti-fouling and enhanced performance. | 2014-2015 | Guide: Dr. Z. V. P. Murthy Co- Guide: Dr. Chetan M. Patel |
| Gautam K. P. | Preparation and performance analysis of nanomaterials for lithium ion battery and supercapacitor | 2015-2016 | |
| Vijay Kumar Singh | Preparation of 2D materials by liquid phase exfoliation in stirred media mills and their applications | 2016-2017 | - |
| Rahul Jaijan | Preparation of Curcumin Nanoparticles and Nanogel By Stirred Media Mills | 2017-2018 | - |
| Nishtha Roy | Synthesis of MnO ₂ Nanoparticles/Graphene Oxide based Nanocomposite as an Electrode Material for Supercapacitor Application | 2018-2019 | - |
| Kanika Meena | Preparation of nanomaterials by nanomilling | Ongoing | - |

Ph. D. Students Supervised:

| Student Name | Title of Thesis | Status | Remarks |
|----------------|---|---------------------------|---|
| Raj Kumar | DEM simulation of powder flow and storage in silo. | Pre-synopsis Submission | Supervisor: Dr. Chetan M. Patel Co-Supervisor: Dr. A. K. Jana |
| Sanjay Krishna | Molecular simulation to predict the properties of Nanocomposites. | Sixth Semester completed | Supervisor: Dr. Chetan M. Patel |
| Ashwin Kamble | Separation of gas mixture by nanocomposite membranes | Fifth Semester completed | Supervisor: Dr. Z. V. P. Murthy Co-Supervisor: Dr. Chetan M. Patel |
| Suhas Doke | Applications of nanoparticles in micro fluidic applications | Fourth Semester completed | Supervisor: Dr. V. N. Lad Co-Supervisor: Dr. Chetan M. Patel |
| Santosh Barik | DEM simulation of particle coating | First Semester | Supervisor: Dr. Chetan M. Patel Co-Supervisor: Dr. V. N. Lad |

Research Publications in International Journals (20)

1. **Chetan M. Patel**, Z.V.P. Murthy* and Mousumi Chakraborty, Effects of Operating Parameters on the Production of Barium Sulfate Nanoparticles in Stirred Media Mill, *Journal of Industrial and Engineering Chemistry*, Vol.18 (No.4) (2012) 1450-1457. DOI: 10.1016/j.jiec.2012.02.005 (Elsevier Scientific Publication, USA) (Impact Factor: 2.145/2012)
2. **Chetan M. Patel**, Mousumi Chakraborty and Z.V.P. Murthy*, Study on the Stability and Microstructural Properties of Barium Sulfate Nanoparticles Produced by Nanomilling, *Advanced Powder Technology*, Vol. 25 (No.1) (2014) 226-235. DOI: 10.1016/j.appt.2013.04.003 (Elsevier Scientific Publication, The Netherlands) (Impact Factor: 1.642/2013)
3. **Chetan M. Patel**, Mousumi Chakraborty and **Z.V.P. Murthy***, Preparation of Fenofibrate Nanoparticles by Combined Stirred Media Milling and Ultrasonication Method, *Ultrasonics Sonochemistry*, Vol. 21 (No.3) (2014) 1100-1107. DOI: 10.1016/j.ultsonch.2013.12.001 ((Elsevier Scientific Publication, The Netherlands) (Impact Factor: 3.816/2012)
4. **Chetan M. Patel**, Mousumi Chakraborty and **Z.V.P. Murthy***, Enhancement of Stirred Media Mill Performance by a New Mixed Media Grinding Strategy, *Journal of Industrial and Engineering Chemistry*, Vol. 20 (No.4) (2014) 2111-2118. DOI: 10.1016/j.jiec.2013.09.040 (Elsevier Scientific Publication, USA) (Impact Factor: 3.512/2013)
5. **Chetan M. Patel**, Mousumi Chakraborty, and Z.V.P. Murthy, Influence of pH on the Stability of Alumina and Silica Nanosuspension Produced by Wet Grinding, *Particulate Science and Technology*, Vol.33 (3) (2015) 240-245. DOI: 10.1080/02726351.2014.978425 (Taylor & Francis Group Publication, USA) (Impact Factor: 0.523/2014)
6. **Chetan M. Patel**, Mousumi Chakraborty, and Z.V.P. Murthy, Fast and scalable preparation of starch nanoparticles by stirred media milling, *Advanced Powder Technology*, Vol. 27 (4), (2016) 1287-1294 (Elsevier Scientific Publication, The Netherlands) DOI: 10.1016/j.appt.2016.04.021 (Impact Factor: 2.638/2014-15)
7. J. H. Jhaveri, **C. M. Patel**, Z.V.P. Murthy, Preparation, characterization and application of GO TiO₂/PVC mixed matrix membranes for improvement in performance. *Journal of Industrial and Engineering Chemistry* 52 (2017), 138-146. (Elsevier Scientific Publication, USA) DOI: <https://doi.org/10.1016/j.jiec.2017.03.035> (Impact Factor: 4.421/2016)
8. **Patel Chetan M.**, Preparation of Lamotrigine Drug Nanoparticles by Nanomilling, *Research Journal of Chemistry and Environment*, Vol. 22 (2018), 7-11. (World Research Journals,India)
9. Raj Kumar, **Chetan M. Patel**, Arun K. Jana, Srikanth R. Gopireddy, Prediction of hopper discharge rate using combined discrete element method and artificial neural network. *Advanced Powder Technology* 29 (2018) 2822–2834. (Elsevier Scientific Publication, The Netherlands) <https://doi.org/10.1016/j.appt.2018.08.002> (Impact Factor: 2.943/2018)
10. Jainesh H. Jhaveri, **Chetan M. Patel**, Z. V. P. Murthy, Reactive Modification of PVC Membranes for the Improved Performance, *Membrane Water Treatment*, 9 (6) (2018) 385-392. <https://doi.org/10.12989/mwt.2018.9.6.385> (Techno-Press, Korea) (Impact Factor: 1.167/2017)
11. Vijay Kumar Singh, **Chetan M. Patel**, A novel method to prepare two-dimensional manganese dioxide and its potential application as a sensor to detect hydrogen peroxide and L-ascorbic acid in water. *Separation Science and Engineering*, 54 (2019) 258-264. (Taylor and Francis Publications. USA) <https://doi.org/10.1080/01496395.2018.1437181>(Impact Factor: 1.2/2017)

12. Ashwin R. Kamble, **Chetan M. Patel**, and Z. V. P. Murthy, Modification of PVDF membrane by two-dimensional inorganic additive for improving gas permeation. *Separation Science and Technology*, 54(3) (2019) 311–328. (Taylor and Francis Publications, USA) <https://doi.org/10.1080/01496395.2018.149611>. (Impact Factor: 1.2/2017)
13. Ashwin R. Kamble, **Chetan M. Patel**, and Z. V. P. Murthy, Effects of inorganic additive of two-dimensional hexagonal boron nitride on the gas separation/permeation for PVDF derived membranes. *Separation Science and Technology*, 54 (9) (2019) 1489–150 (Taylor and Francis Publications, USA) <https://doi.org/10.1080/01496395.2019.1577451> (Impact Factor: 1.2/2017)
14. **Chetan M. Patel**, Particle Size Characterization and Analysis, **Chemical Engineering**, 126 (7) (2019) 54-60. (Chemical Week Associates Publishers)
15. Raj Kumar, Srikanth R. Gopireddy, Arun K. Jana, **Chetan M. Patel**, Study of the discharge behavior of Rosin-Rammer particle-size distributions from hopper by discrete element method: A systematic analysis of mass flow rate, segregation and velocity profiles, *Powder Technology* 360 (2020) 818-834. <https://doi.org/10.1016/j.powtec.2019.09.044> (Elsevier Scientific Publication, USA) (Impact Factor: 3.413/2018)
16. Sanjay Krishna, **Chetan M. Patel**, "Preparation of Coconut Shell Nanoparticles by Wet-Stirred Media Milling". *Materials Letters* 257 (2019) 126738. <https://doi.org/10.1016/j.matlet.2019.126738> (Elsevier Scientific Publication, USA) (Impact Factor: 3.019/2018)
17. Ashwin R. Kamble, **Chetan M. Patel**, and Z. V. P. Murthy, Different 2D materials based polyetherimide mixed matrix membranes for CO₂/N₂ Separation, *Journal of Industrial and Engineering Chemistry*, 81(2020) 451-463. <https://doi.org/10.1016/j.jiec.2019.09.035> (Elsevier Scientific Publication, USA) (Impact Factor: 4.978/2019)
18. Sanjay Krishna, **Chetan M. Patel**, Computational and Experimental Study of Mechanical Properties of Nylon 6 Nanocomposites reinforced with Nanomilled Cellulose. *Mechanics of Materials*, 143 (2020) 103318. <https://doi.org/10.1016/j.mechmat.2020.103318> (Elsevier Scientific Publication, USA) (Impact Factor: 2.958/2018)
19. Raj Kumar, Srikanth R. Gopireddy, Arun K. Jana, **Chetan M. Patel**, Effect of horizontal vibrations on mass flow rate and segregation during hopper discharge: Discrete Element Method Approach, Accepted for publication in *Sadhna*.
20. **Chetan M. Patel**, Preparation of Nanoparticles of Poorly Water Soluble Drugs (PWSDs) by Nanomilling. Accepted for Publication in **Research Journal of Biotechnology** 22(2018), 7-11 (World Research Journals, India)

Papers Presented & Published In International Conferences Proceedings

1. Paper presented on "Effect of bed porosity on shape of particles", at Fourth Asian Particle Technology Symposium during September 14-16, 2009, New Delhi.
2. Paper presented on "Influence of pH on the Stability of Alumina and Silica Nanosuspension Produced by wet grinding", at PGBSIA-2013 during November 28-30, 2013, Patiala.

3. Paper presentation: "Simulations of Nylon-6/Starch Nanocomposites to Analyze the Mechanical Behaviour" at 5th International Conference on "Nanotechnology and Materials Science" on October 14th-16th 2017.
4. Raj Kumar, Chetan M. Patel, Arun K. Jana Srikanth R. Gopireddy, Numerical Study of the Effects of Vibration on Segregation and Mass Discharge Rate From a Conical Hopper, presented at Asian Particle Technology Symposium, July 30- August 3, 2017, Taoyuan, Taiwan.
5. Sanjay Krishna¹ and Dr. Chetan M. Patel., MD Simulations of Mechanical behaviour of Nylon-6/Nano-Starch Nanocomposites, proceedings of 3rd International World Research Journals, 2018, Bangalore, 10th to 12th January.
6. Sanjay Krishna¹ and Dr. Chetan M. Patel, Mechanical Simulations of Nylon6/nano-Alumina Nanocomposites, proceedings of 3rd International World Research Journals, 2018, Bangalore, 10th to 12th January.
7. Chetan M. Patel, Optimization and Preparation of Calcium Carbonate Nanoparticles using Taguchi and Artificial Neural Networks at 3rd International World Research Journals Congress during 10th to 12th January, 2018, Bangalore.
8. Raj Kumar, Chetan M. Patel, Arun K. Jana Srikanth R. Gopireddy, Investigation of Mass Discharge Rate and Segregation from Hopper by Discrete Element Method, Proceedings of the "V International Conference on Particle-Based Methods. Fundamentals and Applications (PARTICLES 2017)", Hannover, Germany, September 26-28, 2017, pp. 351.
9. Raj Kumar, Chetan M. Patel, Arun K. Jana Srikanth R. Gopireddy, The relationship between flow density, hopper angle and particle-size distribution during conical hopper discharge: Experimental and Numerical Analysis. Proceedings of the "9th International Conference on Conveying and Handling of Particulate Solids (CHoPS-2018)", London, UK, September 10-14, 2018.
10. Ashwin R. Kamble, Chetan M. Patel & Z. V. P. Murthy, Modification of PVDF membrane by two dimensional inorganic additive for improving gas separation, *Presented at the National Conference on "Recent Trends on Membranes & Separation Technology" (RTMST-17), Organized by CSIR-Central Salt and Marine Chemicals Research Institute, Bhavnagar, November 22-23, 2017.*
11. Ashwin R. Kamble, Chetan M. Patel & Z. V. P. Murthy, Effects of inorganic additive of two-dimensional hexagonal boron nitride on the gas separation / permeation for PVDF derived membranes, *Presented at the DAE – BRNS Biennial Symposium on Emerging Trends in Separation Science and Technology, (SESTEC – 2018), BITS Pilani, K.K. Birla Goa campus, Goa, India, May 23-26, 2018.*
12. Ashwin R. Kamble, Chetan M. Patel & Z. V. P. Murthy, Recent development in the polymer-inorganic composite membranes for gas separation: A review, *Presented at the 6th IWA Regional Membrane Technology Conference (IWA-RMTC2018) Vadodara, Gujarat, India, December 10-12, 2018.*

Research Project

1. "Fabrication of cathode nanocomposites for applications in supercapacitor and lithium-ion battery by nanogrinding" granted under the research grant to Assistant professor of SVNIT-Surat.
2. Dr. Z.V.P. Murthy, Dr. V. N. Lad, Dr. C. M. Patel, Development of Course "Mechanical Operations" Project of Ministry of Human Resource Development, Government of India for Pedagogy Research Project. 2013-2017.

Reviewed/reviewing technical papers for the following Journals/conferences:

Advanced Powder Technology (6)
Powder Technology (2)
Particulate Science and Technology (1)
Chemical Engineering & Technology (1)
Chemical product and process modeling (1)
Review of two Paper in "Proceedings of the 7th International and 45th National Conference on Fluid Mechanics and Fluid Power (FMFP)"

Editorial Board Member:

One of the Guest Editors for "Separation Science and Technology" (Taylor & Francis Group Publication, USA) Vol.54 (No.2) (2019)

Memberships in Professional Bodies:

- (1) Indian Institute of Chemical Engineers (IChE), LM.
- (2) Indian Society for Technical Education (ISTE), M
- (3) International Congress on Chemistry and Environment (ICCE), M

Expert Lectures

1. 4 hrs of expert lecturers were delivered on Ammonia & Urea Production Technology in "L & T Young Hydrocarbon Professionals Engineering Domain Training Programme" conducted by SPT, Pandit Dindayal Petroleum University, Gandhinagar on 21st april 2011.
2. Modeling and optimization using artificial neural network, ChED, SVNIT-Surat 7th August, 2014.
3. ANN: Theory and Concepts and ANN using STATISTICA, ChED, SVNIT-Surat 26th June, 2015 in STTP on Design of Experiment for Artificial neural network
4. Preparation of Nanomaterials by Nanomilling, ChED, SVNIT-Surat 13th August , 2015 in STTP on Interfacial Engineering and Nanotechnology for Sustainable Environment
5. Fundamentals of Artificial Neural Network, ChED, SVNIT-Surat 9th June, 2016 in STTP on Design of Experiment for process optimization.
6. Dispersion and Preparation of Nano-materials, ChED, SVNIT-Surat 14th July, 2016 in STTP on Recent trends in Chemical Engineering.
7. 3 hrs of expert lecture on Particle and Shape Characterization, ChED, SVNIT-Surat, 1st August, 2016 in STTP on Particle Technology: Characterization and Modeling of Particulate Materials (PT-CMPT-2016).
8. Particle Size Measurement by Dynamic Light Scattering (DLS), ChED, SVNIT-Surat, 2nd August, 2016 in STTP on Particle Technology: Characterization and Modeling of Particulate Materials (PT-CMPT-2016).
9. X-Ray Line Broadening Analysis, ChED, SVNIT-Surat, 3rd August, 2016 in STTP on Particle Technology: Characterization and Modeling of Particulate Materials (PT-CMPT-2016).
10. Image processing by ImageJ for Nano materials Characterization, ChED, SVNIT-Surat, 4th August, 2016 in STTP on Particle Technology: Characterization and Modeling of Particulate Materials (PT-CMPT-2016).
11. Particle Size Measurement by DLS, Applied Chemistry Department, SVNIT-Surat, 21st September, 2016 in STTP on Sophisticated Analytical Techniques in Surface Chemistry
12. Energy Efficient methods for production of Nanomaterials, ChED, SVNIT-Surat, 14th December, 2016 in STTP on Green concepts in engineering and Chemistry
13. Nanosizing-Versatile Technique for Nanoparticles production , Applied Chemistry Department, SVNIT-Surat, 7th October, 2016 in STTP on Micro- & Macro-chemistry Meets Technological Developments.
14. Particle Size Measurement by Dynamic Light Scattering, Applied Chemistry Department, SVNIT-Surat, 20th December, 2016 in STTP on Journey of Analytical Techniques in Chemical and Biological Sciences (JATCBS-2016)

15. Optimization of Nanomilling Process by Artificial Neural Network, ChED, SVNIT-Surat, 10th February, 2017 In STTP on Process Intensification in Chemical Industries

Seminar/ Workshop/Short Term Training Organized:

- ❖ Organized and worked as Faculty Coordinator in Workshop on “**FEM and Artificial Neural Network based modeling and simulations**” on 07/08/2014 Organized at SVNIT-Surat.
- ❖ Organized and worked as Faculty Coordinator “**B. Tech. Course revision workshop**”, on 17/10/2014 Organized at SVNIT-Surat.
- ❖ Organized TEQIP-II Sponsored Short Term Training Programme on “**Particle Technology: Characterization and Modeling of Particulate Materials (PT-CMPT-2016)**”, during 1st August to 5th August, 2016 Organized at SVNIT-Surat.
- ❖ Organized and worked as Faculty Coordinator in TEQIP-II Sponsored International Conference on “**Nanotechnology Applications: Chemical, Energy and Environment (NACEE-2017)**” during 22nd to 23rd March, 2017 Organized at SVNIT-Surat.
- ❖ Organized and worked as Faculty Coordinator in TEQIP-III Sponsored Workshop on “**Workshop on Curriculum and Syllabus Revision Workshop for B.Tech and M.Tech Programme** “ on January 02, 2019 at SVNIT-Surat.
- ❖ Organized and worked as Faculty Coordinator in TEQIP-III Sponsored Workshop on “**Industry Institute Interaction for Higher Education and Entrepreneurship**“ on March 16, 2019 at SVNIT-Surat.
- ❖ Organized and worked as Faculty Coordinator in TEQIP-III Sponsored Short Term Training Programme on “**Research Methodology, Innovation and Academic Administration in Engineering (RMIAAE-2019)**”, during 1st July to 5th July, 2019 Organized at SVNIT-Surat.

Seminar/ Workshop/Short Term Training Programme Attended:

- ❖ “ Introductory Fluent & GAMBIT Training ”, Fluent India Pvt. Ltd., Pune, 12th to 15th Dec, 2005
- ❖ “Gasification of Carbonaceous Feed stocks & SYNGAS Generation”, IIP Dehradun, 19-20 Dec, 2005 at Delhi.
- ❖ “ Energy Conservation in Various Industry ”, SCET, Surat, 26th to 30th Dec, 2005
- ❖ “ Modeling & Optimization of Bio & Environmental Processes ”, IIT Bombay, 10th to 11th Feb, 2006
- ❖ “ Introduction to Computational Fluid Dynamics ”, MED, SVNIT, Surat, 10th to 12th May, 2006
- ❖ “ Faculty Development Programme ”, VNIT, Nagpur, 19th to 30th June, 2006.
- ❖ “ Treatment and Disposal of Wastewaters”, SVNIT, Surat, 05th -09th October, 2009.
- ❖ “Soft Computing Techniques for Optimization”, ABV-IITM, March 04 -09, 2013.
- ❖ “Outcome based education systems”, Equate-Gudgaon, July 02-05, 2014.

Awards/Achievements:

Awarded International Travel grant by SERB, New Delhi

to attend 9th International Workshop on “**Conveying and Handling of Particulate Solids CHoPS (2018)**” during 10-09-2018 to 14-09-2018 at University of Greenwich, London, UK

Responsibilities/ Activities:

- ❖ Actively involved in different Department & Institute level committee
- ❖ Member-Secretary, Department Academic Advisory Committee (DAAC), ChED since inception till 28/01/2019
- ❖ Ph. D. Coordinator, ChED.
- ❖ PG In charge, ChED.
- ❖ Appointed Departmental TEQIP (Phase –I) Coordinator.
- ❖ Worked as CAD Lab in charge, MO Lab in charge.

- ❖ Lab in charge Analytical Laboratory, in charge of DLS
- ❖ Member of Institute Information Management Committee
- ❖ Served as member of Institute Gymkhana committee
- ❖ Member of Departmental Board of Under Graduate studies (**DBUGS**)
- ❖ Served as Factotum in the final examination, invigilator In different national level competitive exam

CHETAN M. PATEL