

Prashant Kumar Bhattacharya

Former Professor Department of Chemical Engineering Indian Institute of Technology Kanpur Kanpur-208016, UP, India www.iitk.ac.in/ChE	Present Contact Address <u>Residence</u> 54, Navsheel Dham Bithoor Road, Singhpur Kalyanpur, Kanpur – 208 017 Mobile: 9839085360/ 8601862800 pkbhatta@iitk.ac.in	Former Director Rajiv Gandhi Institute of Technology Bahadurpur, Mukhetia More, Near Jais Railway Station, Amethi - 229 304 (U.P.), India
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Date of Birth and Place : July 09, 1949 at Kanpur (U.P.)

PROFESSIONAL EXPERIENCE

Director (January 16, 2016 - July 8, 2019):

Rajiv Gandhi Institute of Petroleum Technology (RGIPT)

Main Institute (www.rgipt.ac.in)

Bahadurpur, Mukhetia More, Post: Harbanshgan

Near Jais Railway Station, Amethi - 229 304 (U.P.)

Along with TWO Centres

1) *Bangalore Center (Energy Institute, Bangalore)*

Post Box No. 6429, BSF Campus, Yelahanka

Bengaluru – 560064, Karnataka, India

2) *Assam Energy Institute, Sivasagar*

Gohain Gaon, Akhoiphutia, Dhaili Road

Sivasagar – 785697, Assam

Designation	Period	Organization
Director	January 16, 2016 to July 8, 2019	Rajiv Gandhi Institute of Petroleum Technology, Bahadurpur, Mukhetia More, Post: Harbanshgan Near Jais Railway Station, Amethi - 229 304 (U.P.)
Adjunct Professor	February 22, 2016 to February 21, 2018	Department of Chemical Engineering Indian Institute of Technology, Kanpur–208 016
Emeritus Fellow (On leave last month)	July 1, 2015 to February 16, 2016	- do -

Professor (Re-employed)	August 1, 2014 to June 30, 2015	- do -
Professor (HAG Scale)	January 1, 2009 to July 31, 2014	- do -
Professor	March 1991 to July 31, 2014	- do -
Visiting Professor	May 1992 to July 1992	School of Chemical Engineering University of Bath, UK
Visiting Scientist	Sept. 1987 to July 1988	Seperem spa, Italy (Associates: Prof. E. Drioli and Dr. S. N. Gaeta)
Assistant Professor	Feb. 1979 to Feb. 1991	Department of Chemical Engineering Indian Institute of Technology, Kanpur
Lecturer	October 1977 to January 1979	- do -
Lecturer	July 1977 to October 1977	Department of Environmental Science & Engineering Indian Institute of Technology, Bombay
Sr. Research Assistant	July 1976 to October 1977	Indian Institute of Technology, Bombay Department of Chemical Engineering

ACADEMIC QUALIFICATIONS

Education	Institution/College/School	Period	Subject
Ph. D.	Indian Institute of Technology, BOMBAY	1973 - 1976	Chemical Engineering
M. Tech.	Indian Institute of Technology, BOMBAY	1971 - 1973	Chemical Engineering
B. Sc. (Engg.) in Chem. Engg.	Harcourt Butler Technological Institute, KANPUR	1966 - 1970	Chemical Engineering
Intermediate (10+2)	B. N. S. D. Inter College, Kanpur	1964 - 1970	Physics, Maths, Chemistry
Schooling 6 th to 10 th	Ram Krishna Mission Higher Secondary School, Kanpur	1959 - 1964	All subjects

AREAS OF RESEARCH INTERESTS

Membranes, Membrane Separations; Environmental Pollution; Design and Pulping

- ◆ Dissolved gas removals, reactive extraction of carboxylic acids, using membrane contactors, process modelling, simulation, etc.
- ◆ Functional foods synthesis, bio-desulphurization, metal ion removals using novel bioconjugate reactor, immobilized enzymatic membrane reactor, design and kinetics, etc.

- ◆ Fuel Cell: synthesis & characterization of proton exchange membrane (PEM), water permeation modelling across PEM
- ◆ Pervaporation: dense membrane casting & characterization, liquid mixtures separations including organic-organic, effluent treatment, process modelling, etc.
- ◆ Pressure Driven Membrane Separations (RO/NF/UF/MF): limiting flux phenomena, fouling, mass transfer; design, optimization & process modelling
- ◆ Effluent treatment & process development: for industrial effluents such as paper & pulp, brewery, tannery, etc. development of sugar juice processing, biological treatment of effluent, etc.
- ◆ Electro-dialysis: aqueous stream separations & process analysis, modelling
- ◆ Pulping & Bleaching: its kinetics, process modelling, waste liquor treatment, etc.

AWARDS

- **CSMCRI Chemcon Distinguished Speaker Award for 2016**, A Gold medal, Citation and Rs. 10,000/-. Lecture titled: “Ways to efficiently produce galacto-oligosaccharides from lactose: immobilized enzyme membrane reactor, bioconjugation and development of kinetic models”, at Chennai, December 28, 2016.
- **"Hiyoshi Think of Ecology Award - 2009"** of Hiyoshi Corporation, Japan for Outstanding contribution to applied study for Environmental Conservation and Protection. The Annual Prestigious Award is given to one person and comprises of a memento, cash prize and a citation.
- **"Herdillia Award - 1998"** of **"Indian Institute of Chemical Engineers"** for *"Excellence in basic research in chemical engineering"*. Award carries a memento, citation & cash.
- **"Chemical Engineering R & D Award - 1996"** by **Institution of Engineers (India)**, UP State Centre for "Significant contributions in Membrane Separations". The award carries a memento, citation and cash.
- **Best Research Paper Awards:**
 - Mathematical Analysis of Removal of dissolved Acidic Gases from Aqueous Stream Using Membrane Contactor, Ashutosh Rawat, Gunjan K Agrahari, Niharika Pandey and Prashant K Bhattacharya, 4th International Conference on Chemical Engineering and Applications (CCEA 2013) Paris, France, October 12-13, 2013.

- Prediction of Partial Fluxes during Pervaporative Separation of Toluene-Water, S.V. Satyanarayana, A. Sharma and P.K. Bhattacharya, Chemcon-2001, CLRI, Chennai, 18-21, Dec.2001.

HONOURS

- **Member - Editorial Board**, Indian Journal of Chemical Technology, National Institute of Science Communication and Information Resources (NISCAIR), January 2015-December 2017.
- **Member - Editorial Board** (from 1998 -) for Journal of “Nature, Environment and Pollution Technology”, Techno-science Publications, India.
- **Member – Advisory Committee, Council of Science & Technology**, U.P., Lucknow (2000-2003).
- **“Member – Technical Advisory Panel” of “Centre for Science and Environment – New Delhi”** for “Green Rating of Pulp and Paper Industries”, (Refer to www.cseindia.org → Down to Earth, July 31, 1999 issue).
- **Excellence in Teaching**: Commendation letters from Director, IIT-Kanpur on several times for several courses.

ADMINISTRATIVE RESPONSIBILITIES

- **Director**, Rajiv Gandhi Institute of Petroleum Technology, Jais, January 16, 2016
To July 8, 2019 (attained the age of 70 years; hence superannuated)
- **Chairman, JEE-2010** – I.I.T.-Kanpur: 25th August 2009 to 24th August, 2010
- **Head, Chemical Engineering Department**, I. I. T. – Kanpur from 4th January, 2006 to 9th January, 2009.
- **Chairman, Staff Training Unit**, I.I.T.-Kanpur (2007 -).
- **Chairman - Students Training & Placement Committee** (1993-95):
- **Chairman - Council of Wardens** (1983-84).
- **Advisor - Foreign students** (1990-92).
- **Honorary Secretary – I.I.Ch.E.**, Kanpur Regional Centre (1988-91).
- **Chairman - Hall Constitution Committee** (1981-85).
- **Warden - Hall of Residence I** (1980-85).

TEACHING

Core Course Instructor

- Introduction to Design (TA101)

Undergraduate Course Instructor

- Mass Transfer Operations: Continuous Contact (ChE 313)
- Momentum Transfer Operations and Mechanical separations (ChE 415)
- Chemical Process Calculations (ChE 251)
- Chemical Process Industries (ChE 261A)
- Chemical Process Technology (ChE 361)
- Introduction to Profession (ChE100)

Undergraduate Laboratory Course Instructor

- Unit Operations Laboratory (ChE 391)
- Unit Operations Laboratory (ChE 492)
- Unit Operations Laboratory (ChE 493)

Graduate Course Instructor

- Membrane Separations: Principles, Design and Applications (New Separation Processes - ChE 618)
- Pulp and Paper Science and Technology (ChE 665)

Core Course Tutor (1st & 2nd year UG)

- Engineering graphics (TA 102)
- Introduction to Design (TA101)
- Thermodynamics (ESO 202)
- Introduction to Computer Application (TA 203)
- Fluid Mechanics (ESO 212)

COURSE CONDUCTED:

- 'Recent Advances in Membrane Separation Processes': Course organized and conducted under QIP & continuation programme for engineering faculties and industry personnel, 6-18 Dec.1982. A 600 pages monograph has been prepared.

PATENT

- "Process for the Recovery of Inorganic Compounds from Kraft Liquor"- Director - IIT KANPUR, P. K. Bhattacharya and Sirshendu De. Patent No. (India) 189310; approved on Feb 08, 2003. (<http://ipindia.nic.in/ipirs1/PatentSearch.htm>)

RESEARCH PUBLICATIONS

General Article

- DIRECTIONS@ I.I.T.K, September 2015: Article: Issue: Space Science and Technology, IIT Kanpur publications, Volume 15, No. 1, September 2015. Title of Paper: 'Water flooding in the proton exchange membrane fuel cell', by PK Bhattacharya
- DIRECTIONS@ I.I.T.K, September 2015: Article: Issue: Space Science and Technology, IIT Kanpur publications, Volume 15, No. 1, September 2015. Title of Paper: New insight of proton exchange membranes', by Rajaram K. Nagarale and P. K. Bhattacharya.
- DIRECTIONS@ I.I.T.K, November, 2013. Article: Issue: Industrial Collaborations, IIT Kanpur publications, Volume 13, No. 1. Title of Paper: Adoption of Membrane Technology in Indian Fertilizer, Pulp and Paper, and Textile Industries.

Book Chapter

- "Application of membrane separation technology for recovery of water and inorganics from Kraft paper mill black liquor" - a chapter in the book "Advances in Waste Water Treatment Technologies", Ed., P.K. Goel, Technoscience Publications, Jaipur (1998).

Monograph

- "Recent Advances in Membrane Separation Processes" - a 600 page Lecture Notes was brought-out in connection with a course organized and conducted for engineering faculties and industry personnel in Dec. 2-16, 1982.

Refereed Journals (Separations, Design, Analysis and Modelling)

Published

1. Tapas Palai and Prashant K. Bhattacharya, Enzyme immobilization/bioconjugation in producing galactio-oligosaccharidies from lactose: developments of kinetic models and bio-reactors, Materials Today: Proceedings 3 (2016) 3568–3586.
2. Vinay K. Sachan, A. Michael Rajesh, Rajaram K. Nagarale and P. K. Bhattacharya, "Synthesis and characterization of proton exchange membrane prepared from poly (phenylene oxide) and poly (vinyl alcohol)." *JOURNAL OF THE INDIAN CHEMICAL SOCIETY* 93.7 (2016): 693-702. (Special Issue in the honour Professor M C. Chattopadhyay, former President of Indian Chemical society.).
3. Vinay K Sachan, A Michael Rajesh, Niharika Panday, Rajaram K Nagarale and Prashant K. Bhattacharya, "Basicity Based Screening of Aniline Derivative for Composite Proton Exchange Membranes", *Journal of Applied Polymer Science*, 133 (39), Article Number: 43978, OCT 15 2016.

4. Rahul Kashyap, Tapas Palai and Prashant K. Bhattacharya, Kinetics and model development for enzymatic synthesis of fructo-oligosaccharides using fructosyltransferase, *Bioprocess and Biosystems Engineering*, *Bioprocess Biosyst Eng (Bioprocess and Biosystems Engineering)*, 38(12), (2015) 2417-2426; DOI 10.1007/s00449-015-1478-4.
5. Tapas Palai, Ashok Kumar and Prashant K. Bhattacharya, Kinetic studies and model development for the formation of galacto-oligosaccharides from lactose using synthesized thermo-responsive bioconjugate, *Enzyme and Microbial Technology*, 70 (2015) 42–49.
6. Shivesh Chaudhary, Vinay K Sachan and Prashant K. Bhattacharya, Two Dimensional Modelling of Water Uptake in Proton Exchange Membrane Fuel Cell, *International Journal of Hydrogen Energy*, 39 (2014) 17802 - 17818.
7. Jogi Ganesh Dattatreya Tadimeteti, Shilpi Jain, Sujay Chattopadhyay, and Prashant Kumar Bhattacharya, "Selection of the Best Process Stream to Remove Ca²⁺ Ion Using Electrodialysis from Sugar Solution," *International Journal of Electrochemistry*, vol. 2014, Article ID 304296, 12 pages, 2014. doi:10.1155/2014/304296.
8. Rajaram K. Nagarale, Vinay K Sachan, Avaneesh K. Singh, Kousar Jahan, Sangamesh G. Kumbar and P. K. Bhattacharya, Development of Redox-conducting Polymer Electrodes for Non-Gassing Electro-Osmotic Pumps: A Novel Approach, *Journal of the Electrochemical Society*, 161 (13) H3029-3034, 2014.
9. Roshan James, Rajaram K. Nagarale, Vinay K. Sachan, Christopher Badalucco, Prashant K. Bhattacharya, and Sangamesh G. Kumbar, Synthesis and Characterization of Sulfonated Polymeric Ionic Membranes for Regenerative Engineering Application, *Polymers for Advanced Technologies*, Volume 25, 1439-1445, Issue 12, Article first published online: 5 SEP 2014. DOI: 10.1002/pat.3385_AUG 2014
10. Deepa C. Khandekar, Tapas Palai, Aman Agarwal and Prashant K. Bhattacharya, Kinetics of sucrose conversion to fructo-oligosaccharides using enzyme (invertase) under free condition, *Bioprocess and Biosystems Engineering*, (2014) 37:2529–2537.
11. Vinay K Sachan, Aruna Devi, Ratna S Katiyar, Rajaram K Nagarale and Prashant K Bhattacharya, Proton Transport Properties of Sulphanilic Acid Tethered Poly(Methyl Vinyl Ether-alt-Maleic Anhydride)-PVA Blend Membranes, *European Polymer Journal* 56 (2014) 45–58.
12. Tapas Palai, Avaneesh K. Singh and Prashant K. Bhattacharya, Enzyme, β -galactosidase immobilized on membrane surface for galacto-oligosaccharides formation from lactose: kinetic study with feed flow under recirculation loop, *Biochemical Engineering Journal*, 88 (2014) 68–76.

13. Gunjan K. Agrahari, Niharika Pandey, Nishith Verma, Prashant K. Bhattacharya, Membrane contactor for reactive extraction of succinic acid from aqueous solution by tertiary amine, *Chemical Engineering Research and Design*, 92 (2014) 2705–2714.
14. Gunjan K. Agrahari, Nishith Verma and Prashant K. Bhattacharya, Removal of benzoic acid from water by reactive extraction using hollow fiber membrane contactor: experiment and modelling, *Clean – Soil, Air, Water*, 42 (7) (July 2014) 901–908.
15. Tapas Palai, Ashok Kumar and Prashant K. Bhattacharya, Synthesis and characterization of thermo-responsive poly-N-isopropylacrylamide bioconjugates for application in the formation of galacto-oligosaccharides, *Enzyme and Microbial Technology* 55 (2014) 40– 49.
16. A Rawat, GK Agrahari, N Pandey, PK Bhattacharya, Mathematical Analysis of Removal of Dissolved Acidic Gases from Aqueous Stream Using Membrane Contactor, *International Journal of Chemical Engineering and Applications* 4 (5), 290 (2013)
17. R. Mahendran and P. K. Bhattacharya, Preparation and Characterization of Positively Charged Polysulfone Nano-filtration Membranes, *Journal of Polymer Engineering*, 33(4) (July 2013) 369-376.
18. Gunjan K. Agrahari, Ashutosh Rawat, Nishith Verma and Prashant IK. Bhattacharya, Removal of dissolved H₂S from wastewater using hollow fiber membrane contactor: experimental and mathematical analysis, *Desalination* 314 (2013) 34–42.
19. Tapas Palai and Prashant K. Bhattacharya, Kinetics of lactose conversion to galacto-oligosaccharides by β -galactosidase immobilized on PVDF membrane, *Journal of Bioscience and Bioengineering*, 115, No. 6 (June, 2013), 668-673.
20. Tapas Palai, Shubhrajyoti Mitra and Prashant K. Bhattacharya, Kinetics and design relation for enzymatic conversion of lactose into galacto-oligosaccharides using commercial grade β -galactosidase, *Journal of Bioscience and Bioengineering*, 114 (4) (2012) 418-423.
21. Gunjan K. Agrahari, Sajal K. Shukla, Nishith Verma and Prashant K. Bhattacharya, Model prediction and experimental studies on the removal of dissolved NH₃ from water applying hollow fiber membrane contactor, *Journal of Membrane Science*, 390– 391 (2012) 164– 174.
22. Ravi Thiyagarajan, Siddana Ravi and Prashant K. Bhattacharya, Pervaporation of methyl-ethyl ketone and water mixture: determination of concentration profile, *Desalination*, 277 (2011) 178–186.
23. Dwaipayan Sen, Ankur Sarkar, Aaron Gosling, Sally L. Gras, Geoff W. Stevens, Sandra E. Kentish, P.K. Bhattacharya, Andrew R. Barber, Chiranjib Bhattacharjee, Feasibility study of enzyme immobilization on polymeric membrane: A case study with enzymatically galacto-oligosaccharides production from lactose, *Journal of Membrane Science*, 378 (2011) 471– 478.

24. Gunjan Kumar Agrahari, Nishith Verma and Prashant K. Bhattacharya, Application of hollow fiber membrane contactor for the removal of carbon dioxide from water under liquid-liquid extraction mode, *Journal of Membrane Science*, 375 (2011) 323–333.
25. Dwaipayan Sen, Aaron Gosling, Geoff W. Stevens, Prashant K. Bhattacharya, Andrew R. Barber, Sandra E. Kentish, Chiranjib Bhattacharjee, Sally L. Gras, Galactosyl oligosaccharide purification by ethanol, *Precipitation, Food Chemistry*, 128 (2011) 773–777.
26. Mrinal Kanti Mandal, Sudhindra B. Sant and P. K. Bhattacharya, “Dehydration of aqueous acetonitrile solution by pervaporation using PVA-iron oxide nanocomposite membrane”, *Colloids and Surfaces A: Physicochemical & Engineering Aspects*, 373 (2011) 11–21.
27. Amish Mandowara and Prashant K. Bhattacharya, “Simulation studies of ammonia removal from water in a membrane contactor under liquid-liquid extraction mode”, *Journal of Environmental Management*, 92 (2011) 121-130.
28. Smita Dixit, Ashok Khanna, Yamini Sudha S., Sulekha Mukhopadhyay and Prashant K. Bhattacharya, “Modelling and prediction of removal of metal ions from aqueous solution through facilitated transport”, *International Journal of Environmental Engineering* 2 (1-3), 73-91 (2010).
29. Amish Mandowara and Prashant K. Bhattacharya, “Membrane contactor as degasser operated under vacuum for ammonia removal from water: A numerical simulation of mass transfer under laminar flow conditions”, *Computers & Chemical Engineering*, 33, 1123–1131 (2009).
30. Gopal R. Nemmani, Satyanarayana V. Suggala and Prashant K. Bhattacharya, “NSGA-II for Multiobjective Optimization of Pervaporation Process: Removal of Volatile organics from Water”, *Industrial Engineering Chemistry Research* 48 (3) 1543-1550 (2009).
31. Chiranjib Bhattacharjee, Dwaipayan Sen, Projjwal Sarkar, S. Datta, P.K. Bhattacharya, Studies on the application of different ANNs in prediction of permeate flux in rotating disk membrane module: A case study with MATLAB™, *Desalination and Water Treatment*, 2, 170 –184 (2009).
32. Mrinal K. Mandal and P. K. Bhattacharya, “Poly (vinyl acetal) membrane for pervaporation of benzene-isooctane solution”, *Separation & Purification Technology*, 2007, 61 (2008) 332–340.
33. Purna C. Rao, Mrinal Kanti Mandal and P. K. Bhattacharya, “Pervaporation of aqueous solution present with low concentration acetic acid, using modified poly (ether-block-amide) membranes”, *Indian Chemical Engineer*, Vol. 49 No. 4 October-December 2007, pp. 311-323 (invited paper - Diamond Jubilee issue – 2007).
34. Mrinal Kanti Mandal, Sukalyan Dutta and P. K. Bhattacharya, “Characterization of Blended Polymeric Membranes for Pervaporation of Hydrazine Hydrate”, *Chemical Engineering Journal*, 138, 10–19 (2008).

35. Mrinal K. Mandal and P. K. Bhattacharya, "Poly (ether-block-amide) membrane for pervaporative separation of pyridine present in low concentration in aqueous solution", *Journal of Membrane Science*, 286, 115-124 (2006).
36. Jain S. K., M. K. Purkait, P. K. Bhattacharya, S. De, "Treatment of leather plant effluent by membrane separation processes", *Separation & Purification Technology*, 41 (15), 3329-3348, 2006.
37. Sumesh P. T. and P. K. Bhattacharya, "Analysis of Phase Change during Pervaporation with Single Component Permeation", *Colloids and Surfaces A: Physicochemical & Engineering Aspects*, 290, 263–272 (2006).
38. Gargi Ghosh and Prashant K. Bhattacharya, "Hexavalent chromium ion removal through micellar enhanced ultrafiltration", *Chemical Engineering Journal: Environmental Chemical Engineering I*, 119, 45 - 53 (2006).
39. C. Bhattacharjee, P. Sarkar, S. Datta, B. B. Gupta and P. K. Bhattacharya, "Parameter estimation and performance study during ultrafiltration of Kraft Black Liquor", *Separation & Purification Technology*, 51 (3), 247-257 (2006).
40. Chiranjib Bhattacharjee, B. B. Gupta and P. K. Bhattacharya, "Performance study on ultrafiltration of Kraft Black Liquor and membrane characterization using Spiegler-Kedem model", *Korean Journal of Chemical Engineering*, 23(4), 617-624 (2006).
41. S. V. Satyanarayana, V. S. Subrahmanyam, H. C. Verma, A. Sharma, P. K. Bhattacharya, "Application of positron annihilation: Study of pervaporation dense membranes", *Polymer*, 47, 1300-1307 (2006).
42. Chiranjib Bhattacharjee and P. K. Bhattacharya, Ultrafiltration of black liquor using rotating disk membrane module, *Separation & Purification Technology*, 49 (3) 281-290 (2006).
43. Nazish Hoda, Satyanarayana V. Suggala and Prashant K. Bhattacharya, "Pervaporation of Hydrazine – Water through Hollow Fiber Module: Modelling and Simulation", *Computers & Chemical Engineering*, 30 (2) 202-214 (2005).
44. Chandan Guria, P. K. Bhattacharya and S. K. Gupta, "Multi-objective optimization of reverse osmosis desalination units using different adaptations of the non-dominated sorting genetic algorithm (NSGA)", *Computers & Chemical Engineering*, 29 (9) 1977-1995 (2005).
45. R. Jayan, C. Bhattacharjee and P. K. Bhattacharya, "A combined biological and membrane based treatment of prehydrolysis liquor from pulp mill", *Separation & Purification Technology*, 45 (2) 119-130 (2005).
46. M. K. Purkait, S. De, P. K. Bhattacharya, "Membrane filtration of leather plant effluent: Flux decline mechanism", *Journal of Membrane Science*, 258, 85 – 96 (2005).

47. R. L. Rath, C. Bhattacharjee, Shikha Jain, P. K. Bhattacharya, "Treatment of prehydrolysis liquor from pulp mill using biological route followed by Reverse Osmosis", *Chemical Engineering & Technology*, 28 (10) 1201-1211 (2005).
48. P. K. Bhattacharya, R. K. Todi, M. Tiwari, C. Bhattacharjee, S. Bhattacharjee, S. Dutta, "Studies on UF of spent sulfite liquor (SSL) using various membranes for the recovery of lignosulphonates", *Desalination*, 174, 287 – 297 (2005).
49. S. V. Satyanarayana, P. K. Bhattacharya, "Pervaporation of Hydrazine Hydrate: Separation characteristics of membranes with hydrophilic to hydrophobic behaviour", *Journal of Membrane Science*, 238, 103 -115 (2004).
50. S. V. Satyanarayana, A. Sharma and P. K. Bhattacharya, "Composite membranes for hydrophobic pervaporation: Study with toluene-water system", *Chemical Engineering Journal*, 102, 171 -184 (2004).
51. A. Sharma, S. P. Thampi, S. V. Suggala and P. K. Bhattacharya, Pervaporation from a dense membrane: Roles of permeant – membrane interactions, Kelvin effect, and membrane swelling, *Langmuir*, 20 (2004) 4708.
52. S. Datta, P. K. Bhattacharya and N. Verma, "Removal of Aniline from Aqueous Solution in a Mixed Flow Reactor using Emulsion Liquid Membrane", *Journal of Membrane Science*, 226, 185 – 201 (2003).
53. Satyanarayana V. Suggala and Prashant K. Bhattacharya, "Real Coded Genetic Algorithm for Optimization of Pervaporation Process Parameters for Removal of Volatile Organics from Water", *Industrial Engineering Chemistry Research*, 42 (13), 3118 -3128 (2003).
54. U. V. S. RamGopal, N. Verma and P. K. Bhattacharya, "Analysis of flux decline during ultrafiltration of sugarcane juice (limed) using cross-flow cell", *Canadian Journal of Chemical Engineering*, 80(1), 105-115 (2002).
55. S. RoyChowdhury, P. Kumar, P. K. Bhattacharya and A. Kumar, "Separation characteristics of modified polysulfone ultrafiltration membranes using NO_x", *Separation & Purification Technology*, 24, 271-282 (2001).
56. S. Ralph Jadhav, N. Verma, A. Sharma and P. K. Bhattacharya, "Flux and retention analysis during micellar enhanced ultrafiltration for the removal of phenol and aniline", *Separation & Purification Technology*, 24, 541-557 (2001).
57. A.D. Sarode, N. Verma and P. K. Bhattacharya, "Analysis of retention and flux decline during ultrafiltration of limed sugarcane (clarified) juice", *Chemical Engineering Communications*, 188, 179-206 (2001).

58. P. K. Bhattacharya, Shilpi Agarwal, S. De and U.V.S. RamaGopal, "Ultrafiltration of sugar cane juice for recovery of sugar: analysis of flux and retention", *Separation & Purification Technology*, 21, 247-259 (2001).
59. S.V. Satyanarayana, P. K. Bhattacharya, S. De, "Flux decline during ultrafiltration of Kraft black liquor using different flow modules: a comparative study", *Separation & Purification Technology*, 20, 155-167 (2000).
60. S. De and P. K. Bhattacharya, "Mass transfer coefficient with suction including property variations in applications of cross-flow ultrafiltration", *Separation & Purification Technology*, 16, 61-73 (1999).
61. S. De and P. K. Bhattacharya, "Modelling of ultrafiltration process for a two component aqueous solution of low and high (gel-forming) molecular weight solutes", *Journal of Membrane Science*, 136, 57-69 (1997).
62. M. Syamal, S. De and P. K. Bhattacharya, "Phenol solubilization by cetyl pyridinium chloride micelles in micellar enhanced ultrafiltration", *Journal of Membrane Science*, 137, 99-107 (1997).
63. S. De, S. Bhattacharjee, A. Sharma and P. K. Bhattacharya, "Generalized integral and similarity solutions for concentration profiles for osmotic pressure controlled ultrafiltration", *Journal of Membrane Science*, 130, 99-121 (1997).
64. S. De and P. K. Bhattacharya, "Prediction of mass transfer coefficient with suction in the applications of reverse osmosis and ultrafiltration", *Journal of Membrane Science*, 128, 119-131 (1997).
65. S. De, J.M. Dias and P. K. Bhattacharya, "Short and long term flux decline analysis in ultrafiltration", *Chemical Engineering Communications*, 159, 67-89 (1997).
66. S. Bhattacharjee, A. Sharma and P. K. Bhattacharya, "Estimation and influence of long range solute-membrane interactions in ultrafiltration", *Industrial Engineering Chemistry Research*, 35(9), 3108-3121 (1996). [Invited paper for the special issue in honour of Prof. E. Ruckenstein].
67. S. Bhattacharjee, A. Sharma and P. K. Bhattacharya, "A unified model for flux prediction during batch cell ultrafiltration", *Journal of Membrane Science*, 111, 243-258 (1996).
68. S. De and P. K. Bhattacharya, "Flux prediction of black liquor in cross-flow ultrafiltration using low and high rejecting membranes", *Journal of Membrane Science*, 109, 109-123 (1996).
69. S. De and P. K. Bhattacharya, "Recovery of water with inorganic chemicals from Kraft black liquor using membrane separation processes", *Tappi Journal*, 79(1), 103-111 (1996).
70. S. De, S. Bhattacharjee and P. K. Bhattacharya, "Development of correlations for mass transfer coefficient in ultrafiltration systems", *Developments of. Chemical Engineering & Mineral*

- Processes, 3, 187-206 (1995). [Invited paper for special theme issue: Advances in Membrane Separation and Adsorption].
71. S. Bhattacharjee, A. Sharma and P. K. Bhattacharya, "Surface interactions in osmotic pressure controlled flux decline during ultrafiltration", *Langmuir*, 10, 4710-4720 (1994).
 72. S. Ganguly and P. K. Bhattacharya, "Development of concentration profile and prediction of flux for ultrafiltration in a radial cross flow cell", *Journal of Membrane Science*, 97, 185-198 (1994).
 73. C. Bhattacharjee and P. K. Bhattacharya, "Flux decline analysis in ultrafiltration of Kraft black liquor", *Journal of Membrane Science*, 82, 1-14 (1993).
 74. C. Bhattacharjee and P. K. Bhattacharya, "Prediction of limiting flux in ultrafiltration of kraft black liquor", *Journal of Membrane Science*, 72, 137-147 (1992).
 75. S. Bhattacharjee and P. K. Bhattacharya, "Flux decline behaviour with low molecular weight solutes during ultrafiltration in an unstirred cell", *Journal of Membrane Science*, 72, 149-161 (1992).
 76. P. K. Bhattacharya, S. De, R. Halder and R. Thakur, "Kinetic studies on soda - anthraquinone pulping of Indian mixed hardwoods", *Tappi Journal*, 75, 123-127 (1992).
 77. S. Sridhar and P. K. Bhattacharya, "Limiting flux phenomena in ultrafiltration of Kraft black liquor", *Journal of Membrane Science*, 57, 187-206 (1991).
 78. P. K. Bhattacharya, A. Ramkrishnan and R. Halder, "Comparative studies on soda-anthraquinone pulping for rice straw and Indian mixed hardwoods", *IPPTA*, 3, 1-7 (1991).
 79. S. Dasgupta and P. K. Bhattacharya, "Comparative limiting flux analysis of black liquor and polyethylene glycol in ultrafiltration", *Chemical Engineering Communications*, 93, 193-210 (1990).
 80. T.K. Poddar, R.P. Singh and P. K. Bhattacharya, "Ultrafiltration flux and rejection characteristics of black liquor and polyethylene glycol", *Chemical Engineering Communications*, 75, 39-56 (1989).
 81. A.K. Mishra and P. K. Bhattacharya, "Alkaline black liquor treatment by continuous electrodialysis", *Journal of Membrane Science*, 33, 83-95 (1987).
 82. Rajnish and P. K. Bhattacharya, "Ultrafiltrative solute rejection behaviour of black liquor", *ACS Symposium Series No. 281(24)*, 313-323 (1985).
 83. A.K. Mishra and P.K. Bhattacharya, "Alkaline black liquor treatment by batch electrodialysis", *Canadian Journal of Chemical Engineering*, 62, 723-727 (1984).
 84. Ramakrishnan and P. K. Bhattacharya, "Studies on soda-anthraquinone pulping using rice straw", *CHIMICA Oggi*, 10, 67-72 (1988).
 85. R. Halder and P. K. Bhattacharya, "Studies on Kraft and soda-anthraquinone pulping of Indian mixed hardwoods", *Tappi Journal*, 70(6), 129-132 (1987).

86. M. K. Trivedi and P. K. Bhattacharya, "Upgrading of cellulose pulps. Part 1, removal of pentosans and mineral matter", IPPTA, 11(4), 62-65 (1974).
87. N.C. Shah and P. K. Bhattacharya, "Bleach plant effluent treatment by fly-ash", CHIMICA oggi, 3, 59-63 (1988).
88. S. N. Gaeta, P. K. Bhattacharya and E. Drioli, "Caratteristiche di sporcamento durante prove di osmosi inversa con effluenti dill'industria tessile", Aqua Aria, 10, 1259-1262 (1988).
89. P. K. Bhattacharya, V. Parthiban and D. Kunzru, "Pyrolysis of black liquor solids", Industrial Engineering Chemistry: Process, Design & Developments, 25, 420-426(1986).
90. P. K. Bhattacharya, A.S. Shrinath and D. Kunzru, "Pyrolysis of black liquor", Journal of Chemical Technology & Biotechnology, 35A, 223-233 (1985).
91. M.P. Gupta and P. K. Bhattacharya, "Studies on colour removal from bleach plant effluent of kraft pulp mill", Journal of Chemical Technology & Biotechnology, 35B, 23-32 (1985).
92. Invited paper for All India Small Paper Mills Association: "A look towards pollution abatement, usage and energy conservation with black liquor", published in its 9th Annual Report, 1985.
93. P. K. Bhattacharya and S. Basu, "Enhancement of gypsum based Kraft process causticized sludge sedimentation rate under inclined condition", Canadian Journal of Chemical Engineering, 61(6), 811-815 (1983).
94. P. K. Bhattacharya and S. Basu, "Modern trends in the field of black liquor regeneration", IPPTA, 14(4) (1977).
95. P. K. Bhattacharya and S. Basu, "Modification of the Kraft recovery process: salt cake replaced by gypsum", Indian Chemical Engineer, 19(4), 11-17(1977).

Conference Presentations

1. Mathematical Analysis of Removal of dissolved Acidic Gases from Aqueous Stream Using Membrane Contactor, Ashutosh Rawat, Gunjan K Agrahari, Niharika Pandey and Prashant K Bhattacharya, 4th International Conference on Chemical Engineering and Applications (CCEA 2013) **Paris, France**, October 12-13, 2013.
2. Synthesis and characterization of thermo-responsive bioconjugates: immobilized enzyme for galacto-oligosaccharide formation, Tapas Palai, Ashok Kumar and Prashant K. Bhattacharya, **AICHe Annual meeting, San Francisco, CA, USA**, 3-8 November, 2013.
3. Enzymatic reaction (β -galactosidase immobilized on membrane) for the formation of galacto-oligosaccharides with feed lactose under recirculation mode, Tapas Palai, Avaneesh K. Singh and Prashant K. Bhattacharya, International Conference on Advances in Chemical Engineering (ACE 2013) February 22-24, 2013. IIT Roorkee.

4. Modelling of Electrodialytic Removal of Multiple Ions from Synthetic Solutions Tuesday, Jogi Ganesh Dattatreya Tadimeti, Shilpi Jain, Navneet Kumar, Sujay Chattopadhyay, Amiya Kumar Ray and P.K. Bhattacharya, Conference Proceedings Cep. AIChE 2012, **AIChE Annual Meeting in Pittsburgh, PA**, October 30, 2012:
5. Removal of dissolved ammonia from wastewater employing hollow fiber membrane contactor: Gunjan K Agrahari, Sajal K Shukla, Nishith Verma, Prashant K Bhattacharya, 11th **World Filtration Congress, Graz-Austria**, April 16-20, 2012.
6. A study with enzymatic membrane reactor (EMR) for conversion of lactose in to galacto-oligosaccharides (GOS): Tapas Palai, Pallavi Kumari and Prashant K. Bhattacharya, Third International Conference on Chemical Engineering: ICChE-2011' to be held from 29-30 December, 2011 at **BUET, Dhaka**.
7. Pervaporation of Methyl-Ethyl Ketone from its aqueous solution: Development of Concentration Profile, S. Ravi, T. Ravi and P.K. Bhattacharya in International Scientific Conference on Pervaporation and Vapour Permeation, April 18-21, 2010, **Torun (Poland)**.
8. Pervaporation of methyl-ethyl ketone and water mixture: Development of concentration profiles across membrane by S. Ravi, T. Ravi and P. K. Bhattacharya, CHEMCON-2009, Vishakhapatnam, December 27-30, 2009.
9. Chitosan-Gelatin blend membranes for pervaporation dehydration of 1,4-dioxane, Shivanand Teli and P. K. Bhattacharya in International Conference on Advances in Polymer Science & Technology (POLY-2008), January 28-31, 2008, New Delhi.
10. Preparation and Characterization of Charged Nano-filtration Membranes by M. Rajagopalan, B.B. Gupta and P. K. Bhattacharya in ECWATECH-2008, IWA Regional Conference on Membrane Technologies in Water and Waste Water Treatment, 3-6 June, **Moscow, Russia**.
11. Preparation and characterization of positively charged nano-filtration membranes, P. K. Bhattacharya and Mahendran Rajagopalan in World Filtration Congress WFC10 to be held on APRIL 14-18, 2008 in **Leipzig, Germany**.
12. Novel chitosan/gelatin blend-membranes for pervaporative dehydration of 1, 4-dioxane by Shivanand B. Teli, G. S. Gokavi and P. K. Bhattacharya - Presented at International Conference at IIT-Delhi, Dec. 2007.
13. Multi-objective optimization of Pervaporation Process Parameters for the removal of VOCs from water, N. Ramagopal, S.V. Satyanarayana, P. K. Bhattacharya, in Indian Chemical Engineering Congress, CHEMCON-2007, held at Kolkata, April 23-24, 2007.
14. Real Coded GA for Multi-Objective Optimization of Pervaporation Process Parameters for the Removal of Volatile organics from Water, R. G. Nemmani, Satyanarayana V. S., P. K.

- Bhattacharya, in International Conference on Modeling and Simulation (CIT ICOMS 2007) scheduled to be held from 27th to 29th August 2007 at CIT, Coimbatore.
15. Dehydration of HPLC spent solvent for the recovery of acetonitrile by pervaporation: membrane development and characterization: Mrinal Kanti Mandal and P. K. Bhattacharya, ChEmference 2007, held at IIT Kanpur, May 5, 2007.
 16. Recovery of pyridine from its dilute concentration of aqueous solution by pervaporation using poly-ether-block-amide membrane: Mrinal Kanti Mandal and P. K. Bhattacharya, CHEMCON 2006, held at Ankleshwar, Bharuch, Gujarat, during December 27-30, 2006.
 17. Membrane Processes based Effluent Treatment – Some Case Studies, P. K. Bhattacharya, IChE-AIChE meeting during CHEMCON-2004 on Chemical Engineering in a global Environment, December 27-30, 2004 in Mumbai.
 18. Overview of Membrane Technology for Effluent Treatment, P. K. Bhattacharya, Indo – French Seminar on “Emerging Technologies for water and waste water management”, 9 -12 February, 2004 at India Habitat Centre, New Delhi.
 19. Reuse of FDM Components by Solution-Casting Technique, K. Siva Prasad, S. V. Satyanarayana, P. K. Bhattacharya and S. G. Dhande, International Symposium on Rapid - Prototyping & Tooling, HAL, Bangalore, 6-7 June, 2003.
 20. Prediction of Partial Fluxes during Pervaporative Separation of Toluene-Water, S.V. Satyanarayana, A. Sharma and P.K. Bhattacharya, Chemcon-2001, CLRI, Chennai, 18-21, Dec.2001.
 21. Removal of volatile organics from water by pervaporation: optimization of process parameters using real coded Genetic Algorithm, S.V. Satyanarayana, N. Hoda and P.K. Bhattacharya, Chemcon-2001, CLRI, Chennai, 18-21, Dec.2001.
 22. Flux and retention analysis for the ultrafiltration of sugar cane juice for the recovery of sugar, P.K. Bhattacharya, S. Agarwal, S. De, A.D. Sarode and U.V.S. RamGopal. Chemcon-98, 51st Annual session of IChE, Vishakhapatnam, Dec. 16-19, 1998.
 23. Flux and rejection analysis for the removal of phenol and aniline by micellar enhanced ultrafiltration, S.R. Jadhav, A. Sharma and P.K. Bhattacharya. Chemcon-98, 51st annual session of IChE, Vishakhapatnam, Dec. 16-19, 1998.
 24. Osmotic pressure and diffusivity of BSA in aqueous media: Role of acid-base interactions, S. Bhattacharjee, A. Sharma and P.K. Bhattacharya. National Conference on Science and Technology of Self-Organizing Systems, Jadavpur University, Calcutta 1995.
 25. Prediction of limiting flux and estimation of mass transfer coefficient, S. Bhattacharjee and P. K. Bhattacharya. Presented at the annual IChE Conference, Bombay, and Dec. 1993.

26. Mass Transfer studies under cross flow UF, S. De and P.K. Bhattacharya. Presented at the annual IChE conference, Bombay, Dec.1993.
27. Model development for flux decline in UF, S. Bhattacharjee, A. Sharma and P.K. Bhattacharya. (in absentia) Engineering of Membrane Processes II: Environmental Applications, **Tuscany, Italy**, April 26-28, 1994.
28. Flux decline analysis in ultrafiltration of Kraft black liquor, C. Bhattacharjee and P.K. Bhattacharya. Presented at 'Engineering of Membrane Processes', **Garmisch-Partenkirchen, Bavaria, Germany**, 13 -15 May 1992.
29. RO - A case study with textile dyeing process effluents, P.K. Bhattacharya and S. Gaeta. Presented at the seminar on RO for water and wastewater, IWWA, Bombay, Oct. 1990.
30. Treatment of effluents from textile dyeing processes by reverse osmosis: Experimental observation, P.K. Bhattacharya and S. Gaeta. Presented at 'International conference on advances in Chemical Engineering', at IIT Kanpur, Jan. 4-6, 1989.
31. An experimental study in the treatment of textile effluent with membrane technology: exergetic analysis, E. Drioli, S.Gaeta, V. Calabro, P.K. Bhattacharya and E. Vigliani. Presented at the symposium on 'Future industrial prospects of membrane processes', **Brussels (Belgium)**, Dec.6-7, 1988.
32. Fouling characteristics of textile effluents during reverse osmosis, S.N. Gaeta and P. K. Bhattacharya. Presented at 3rd US-Europe symposium on advanced science and technology, **Ravello, Italy**, Oct. 2-8, 1988.
33. Bleach plant effluent treatment by fly ash and ultrafiltration - a comparative study, N.C. Shah and P.K. Bhattacharya. (in absentia) International congress on 'Recent advances in the management of hazardous and toxic wastes in the process industries', **Vienna (Austria)**, March 8-13, 1987.
34. Continuous electrodialysis for the regeneration of alkaline black liquor, A.K. Mishra and P.K. Bhattacharya. Presented at the 37th annual session of IChE in collaboration with AIChE, Dec. 1985 at New Delhi.
35. Ultrafiltrative separation of alkaline black liquor, Rajnish and P.K. Bhattacharya. Presented at ACS and I&EC symposium on Reverse Osmosis and Ultrafiltration, **Philadelphia (USA)**, August 26-30, 1984.
36. Standardization of procedure for the reduction characteristics of calcium sulphate, P. K. Bhattacharya and S. Basu. (in absentia) Chemical Society Analytical Division, SAC 80, at the **Univ. of Lancaster (UK)**, July 20-26, 1980.
37. Modern trends in the field of black liquor regeneration, P.K. Bhattacharya and S. Basu. Presented at the annual conference of IPPTA, 1976 at New Delhi.

38. Studies on the salt cake replacement with gypsum in the modified Kraft recovery process, P.K. Bhattacharya and S. Basu. Presented at 28th annual technical session of Indian Institute of Chemical Engineers, 1975 at Calcutta.
39. Upgrading of cellulose pulps, Part I: Removal of pentosans and mineral matter, P. K. Bhattacharya and M.K. Trivedi. Presented at the annual international conference of IPPTA, 1974 at New Delhi.

SUPERVISED RESEARCH

Ph.D. Theses

1. Synthesis and Characterisation of Charged Polymeric Materials for Different Applications (Vinay Kumar Sachan, June, 2016).
2. Enzymatic Conversion of Lactose to Galacto-oligosaccharides (GOS) (Tapas Palai, July 2014)
3. Removal of Dissolved Gases and Carboxylic Acids from Contaminated Aqueous Streams by Hollow Fiber Membrane Contactor: Experimental, Modelling and Simulation, (Gunjan Kumar Agrahari, May 20, 2013).
4. Pervaporative Separations of Binary Solutions of Organic-Aqueous-Inorganic Systems: Membrane Preparation and Characterization (Mrinal Kanti Mondal, August-2007).
5. Pervaporation studies: design and analysis (S. V. Satyanarayana, July 2003).
6. Studies on flux and retention characteristics during ultrafiltration: design and applied aspects (Sirshendu De, October 1996).
7. Role of surface interactions in prediction of flux decline during ultrafiltration (Subir Bhattacharjee, July 1995).

M. Tech. Theses

1. Bio-conjugation with *Pseudomonas Putida* (bacteria) for the removal of phenol in wastewater: Synthesis and Characterization (Abhinav Porwal, June 2017)
2. Reactive Extraction of Propionic Acid from Aqueous Solution using Hollow Fiber Membrane Contactor (Divya Pratap Singh, June 2017).
3. Thermo-responsive polymer and yeast cells based bioconjugate for the reduction of Cr(VI) from its aqueous solution: Synthesis, Characterization and Kinetics (Juhi Chandra, June, 2016).
4. Application of hollow fiber membrane contactor for the reactive extraction of citric acid: Experimental and Process modelling (Sachin Chhimpa, June, 2016).
5. Thermoresponsive polymer- β -fructosyltransferase based bioconjugate for the preparation of fructo-oligosaccharides from sucrose solution: Synthesis, Characterization and Kinetics (Nidhi Sahu, June, 2016)

6. Kinetics of Fructo-oligosaccharides formation from Sucrose using thermo-responsive poly-N-isopropyl acrylamide- Enzyme Invertase bioconjugate (Rahul Kashyap, 2015)
7. Casting, Characterisation of Proton Exchange Membrane (Shashikant Soni, 2015)
8. Conversion of Sucrose to Fructo-Oligosaccharides using Enzyme Invertase purified Cells (Nishant Bhartiya, 2015)
9. Reactive mixing & separation of Nicotinic acid from aqueous solution by membrane contactor (Ankit Sajjani, 2015)
10. Synthesis and Characterization of Metal Organic Framework Charged Membrane (Ratna Sandeep Katiyar, May 26, 2014)
11. Reactive Extraction of Formic Acid from Aqueous Solution by Hollow Fiber Membrane Contactor: Experimental and Modelling (Abhishek Agarwal, May 26, 2014)
12. Model development for water permeation through proton exchange membrane in fuel cell Comprehensive 3-Dimensional Model Development of Water Permeation across Proton Exchange Membrane in Fuel Cell (Ashutosh Rawat, May 26, 2014).
13. Conversion of Sucrose into Fructo-Oligosaccharides (FOS) using Enzyme Invertase under Free Condition (Ms. Deepa C Khandekar, June 6, 2013).
14. Removal of As (V) from (contaminated) water by facilitated transport using cyanex in toluene: experimental & modelling (Ms. Shruti Gupta, June 6, 2013).
15. Comprehensive Modelling of Water Permeation across Proton Exchange Membrane Fuel Cell as Well as Effects of Inclusion of Osmotic Pump (Shivesh Chaudhary, June 6, 2013).
16. Experimental Studies with Enzymatic Membrane Reactor (EMR) for the Conversion of Lactose to Galacto-Oligosaccharides (GOS) (Goutham Sagar, 8th June, 2010).
17. Experimental and Modelling Studies with Membrane Contactor for Ammonia Gas Removal from Water under Vacuum (Sayantan Bhaduri, 8th June, 2010).
18. Enzymatic Conversion of Lactose to Galacto-oligosaccharides (GOS) (Tapas Palai, 11th January. 2010)
19. Pervaporation of Methyl Ethyl Ketone-Water Liquid Mixture Using Poly dimethyl siloxane and Polyetherblockamide Membranes (Siddana, Ravi Kumar, July 2009)
20. Membrane contactor for ammonia gas removal from water: A numerical simulation analysis (Amish Mandowara, May 2009).
21. Removal of Dissolved Gases ($\text{NH}_3 + \text{CO}_2$) from Urea-Plant Water Condensate through Membrane Contactor (Sajal Kumar Shukla, Dec, 2008).
22. Micellar Enhanced Ultrafiltration for the Removal of Nickel ions from aqueous solution (Yogesh Varshney, May 2008).

23. Modified PVA Membranes Preparation and Characterization for Pervaporative Separation of Methanol-Benzene Mixture (Ravi Bajpai, May 2008).
24. Supported Liquid Membrane Metal Extraction: Modelling, Experimentation and Validation for Flat-Sheet and Hollow-Fibre modules (Ms. Smita Dixit, July 2007).
25. Micellar Enhanced Ultrafiltration for the Removal of Cadmium Ion (Md. Saalim Aslam, July 2007).
26. Preparation and Characterization of membranes: Pervaporation of Benzene-Ethanol (Nitin Sourav, July 2007).
27. Treatment of effluent from inorganic chemical industry by reverse osmosis (Gunjan Agrahari, IET-Lucknow-UPTU, October 2007). **M. Tech. Thesis for other Institute/University**
28. Pervaporation Separation of Acetic acid-Water (dilute range) by utilizing Poly Ether Block Amide Membranes (Purna Chandra Rao, July 2006).
29. Removal of Trivalent Chromium Ions from Aqueous Solution through Micellar Enhanced Ultrafiltration (Aditya Kumar, July 2006).
30. Removal of Chromium (Iii) From Tannery Effluent through Biosorption (N. Ravi Kumar, July 2005).
31. Single Component Permeation during Pervaporation (Sumesh P. T., July 2004).
32. Dehydration of Hydrazine Hydrate by Pervaporation: Blending of Polymers, Modification and Characterization of Membranes (Sukalyan Datta, July 2004).
33. Separation of Volatile Organics (Benzene and Toluene) From Water Using PDMS Membrane (Prince George, July 2004).
34. Studies on Removal of Pentavalent Arsenic through Micellar Enhanced Ultrafiltration (Rakhi Oli, July 2004).
35. Micellar Enhanced Ultrafiltration in CSTR Mode Cell: Optimization of Operating Conditions (S. Sujatha, Dec.2002).
36. Studies on Pervaporation with Single Component Permeation (Asit Kumar Parui, Dec 2002).
37. Removal of Aniline from Aqueous Solution in a Mixed Flow Reactor Using Emulsion Liquid Membranes (Sourabh Dutta, June 2002).
38. Studies on Pervaporative Separation of Ethanol-Water (Arijit Das, June 2002).
39. Studies on Micellar Enhanced Ultrafiltration for the Removal of Hexavalent Chromium (Gargi Ghosh, June 2002).
40. Analysis of Partial Fluxes for the Separation of Ethanol - Water during Pervaporation (Mr. P. Praveen Kumar, Dec. 2001).
41. Prediction of Removal of Ionic Solute during Electrodialytic Process and a Case Study (Mr. Anurag Gupta, Dec. 2001).

42. Biological Treatment of Effluent from Brewery Industry Followed by Reverse Osmosis (Mr. Ramesh Sharma, Dec. 2000).
43. Biological Treatment of Prehydrolysis Liquor (A Pulp Mill Effluent) Followed By Membrane Separations (Mr. J.S. Fating, Dec. 2000).
44. Ultrafiltration and Diafiltration Studies with Spent Sulphite Liquor using different Module Configurations (Mr. Soumitro Ghosh, Dec. 1999).
45. Treatment of Prehydrolysis Liquor through Biological Treatment Followed by Reverse Osmosis (Mr. Rajiv Lochan Rath, Dec. 1999).
46. Recovery of liquisulphonates from agro based spent sulphite liquor through diafiltration (Ms. Sadhana Gupta, July 1999).
47. Studies on the Treatment of Prehydrolysis Liquor (Rayon Grade Pulp Mill Effluent) by Membrane Processes (Mr. R. Jayan, July 1999).
48. Flux And Retention Analysis During Ultrafiltration Of Sugar Cane Juice (Limed) Using Cross Flow Cell (Mr. U.V.S. Ram Gopal, December 1998).
49. Studies on the Ultrafiltration of Clarified Limed Sugarcane Juice for the Recovery of Sugar Using Stirred Cell: Flux and Retention Analysis (Mr. Abhay Sarode, Dec. 1998).
50. Concentration and purification of lignosulfonates from spent sulfite liquor (Mr. Manish Tiwari, June 1998).
51. Studies on flux and rejection during micellar enhanced ultrafiltration for the removal of phenol and aniline from aqueous stream using cetyl pyridinium chloride micelles (Mr. Sameer Ralph Jadhav, May 1998; Co-advisor: Prof. A. Sharma).
52. Studies on recovery and purification of lignosulphonates from spent sulfite liquor (Ms. Susmita Sinha, 1997).
53. Studies on flux decline phenomena in ultrafiltration of sugar cane juice for recovery of sugar (Ms. Shilpi Agarwal, 1996).
54. Development of organic solute concentration profile within micelle for micellar enhanced ultrafiltration studies (Mr. Manoranjan Syamal, Feb., 1996).
55. Modelling of electro dialysis process for impurity removal (Ca^{2+} and Mg^{2+}) from sugar cane juice after liming (Mr. Arunabha Sahu, 1995).
56. Removal of calcium ion from sugar solution through electro dialysis (Mr. Sujoy Chattopadhyay, 1994).
57. Mass transfer studies for the sugar solution concentration through reverse osmosis (Mr. M.V.J. Sarma, Feb., 1994).

58. Analysis of polarized layer resistance through secondary gel layer type in ultrafiltration (Ms. Jennifer M. Dias, Jan. 1993).
59. Development of concentration and velocity profiles in a cross flow ultrafiltration system (Mr. Sirshendu De, 1992).
60. Ultrafiltrative treatment of kraft black liquor (Mr. S. V. Satyanarayan, 1991).
61. Cation-neutral membrane electrodialysis process studies of kraft black liquor (Mr. Suman Roychowdhury, 1991).
62. Development of concentration profile in cross flow ultrafiltration using black liquor in comparison to polyethylene glycol (Mr. Somenath Ganguly, 1991).
63. Prediction of limiting flux in ultrafiltration of kraft black liquor (Mr. Chiranjib Bhattacharjee, 1990).
64. Flux decline studies in unstirred batch cell ultrafiltration (Mr. Subir Bhattacharjee, 1990).
65. Studies on limiting flux phenomena in ultrafiltration of black liquor (Mr. S. Sridhar, Dec. 1989).
66. Comparative limiting flux analysis of black liquor with polyethylene glycol in ultrafiltration (Mr. Sunando Gasgupta, 1987).
67. Studies on flux and rejection behaviour in ultrafiltration (Mr. Tarun K. Poddar, 1986).
68. A comparative study between Kraft and soda - anthraquinone pulping of Indian mixed hardwood (Mr. Raghunath Halder, 1986).
69. Kinetic studies on soda - anthraquinone pulping (Mr. A. Ramakrishnan, 1985).
70. Bleach plant effluent treatment by fly ash and ultrafiltration - A comparative study ((Late) Mr. Navin C. Shah, 1985).
71. Studies on the pyrolysis of black liquor solids (Mr. V. Parthiban, 1983; Co-advisor: Prof. D. Kunzru).
72. Studies on ultrafiltrative solute rejection behaviour of black liquor (Mr. Rajnish, 1983).
73. Studies on the pyrolysis of black liquor (Mr. A.S. Shrinath, 1981; Co-advisor: Prof. D. Kunzru).
74. Studies on electrodialytic treatment of alkaline black liquor (Mr. Ashok K. Mishra, 1980).
75. Studies on the colour removal of bleach plant effluent of Kraft pulp mill (Mr. Mahesh P. Gupta, 1980).

M. Sc. Theses for Other Institute/University

1. Application of Membrane Contactor for the Removal of H₂S gas from wastewater under liquid-liquid extraction mode (Ms. Niharika Pandey, June 2012, supervised for Department of Environmental Science, CSJM University, Kanpur).
2. Biological Treatment with Horse Radish Peroxidase of Waste Water Containing Phenol and Aniline Compounds (Ms. Kumari Soni Misra, June 2012; supervised for Department of Microbiology, Barkatullah University, Bhopal).

3. Concentration polarization analysis during treatment of effluent from inorganic chemical industry by reverse osmosis (Ms. Sabna, May 2008; supervised for Environmental School, Cochin Univ. of Science & Technology, Cochin).
4. Flux decline analysis during treatment of effluent from inorganic chemical industry by reverse osmosis (Ms. Nisheeja, May 2008; supervised for Environmental School, Cochin Univ. of Science & Technology, Cochin).

OVERSEAS VISITS

- **University of Melbourne, Australia:** from 16th to 23rd February, 2008. Visit was part of collaborative project from DBT (India) & DSIT (Australia) on 'Milk Nutraceuticals' with regard to methodologies to be adopted and executed.
- **Institut Européen des Membranes, Montpellier, France:** Twice visited for one month periods (from June-July 2004 and December 2005). Visits were part of Indo-French Project (IFCPAR) to discuss, deliberate on methodologies to be adopted, executed and disseminated in the form of research publications on Effluent Treatment through Membrane Processes.
- **Separem spa, Biella, Italy:** from Sept. 1987 to July 1988. Invited by Prof. Drioli (Univ. of Calabria) to work on an industrial project entitled, "Recovery of Water and Chemicals from Textile Dyeing Effluents", in a membrane manufacturing company (Separem spa); European Economic Commission sponsoring the project. Apart from the development of technology (already commercialized in couple of industries), partial information of the work is also published.
- **University Of Bath, UK:** May-July '1992. A pre-planned work was taken-up to utilize the period of stay effectively. The work was on "Oily-Water Separation through Ceramic Membranes", and was part of a project from Shell-Oil Co., UK. Meaningful data were generated from a MF rig; the results of which were modelled as well.
- **USA (1984; 2012) and Germany (1992):** Attended and presented research papers in international conferences. Further, few invited lectures were also given in institutions.
- **Bangladesh University of Engineering and Technology, Dhaka-Bangladesh** from December 27, 2011-January 1, 2012: Attended and presented a research paper, chaired a technical session as well as judged the poster session at the 3rd international conference in chemical engineering, Dhaka.

SPONSORED RESEARCH FUNDING

GOVERNMENT SPONSORED PROJECTS

1. **Sponsoring Agency: Indian Space Research Organisation (VSSC-ISRO, Thiruvananthapuram)**
 - **Title:** Comprehensive Two & Three Dimensional Modelling of Water Permeation across Proton Exchange Membrane in Fuel Cell integrated with Electro-Osmotic Pump
 - ◆ Total Amount: Rs. 20,70,000/-
 - ◆ Duration: Three years
 - ◆ Starting date (Duration): July 20, 2015
 - ◆ Administrative PI: Dr. Sri Siva Kumar, Assoc. Prof. Dept., Chem. Engg., IIT-Kanpur
2. **Sponsoring Agency: Department of Science & Technology (DST)**
 - Title: Non-gassing electrode materials for Electro-osmotic pumping based subcutaneous drug delivery system
 - Amount proposed: Rs.33.90 Lakhs
 - PI: Dr. RK Nagarale (Ramanujam Fellow associated with me)
 - Duration: Three years
 - Starting date (Duration): May 10, 2013
3. **Sponsoring Agency: Department of Biotechnology (DBT)**
 - Title: Immobilized Enzyme Membrane Reactor for Conversion of Lactose to Galacto-OligoSaccharides (GOS)
 - Amount proposed: Rs. 42,21,800
 - Duration: Three years
 - Starting date (Duration): July 14, 2011 (Three Years; extended for another six months)
4. **Sponsoring Agency: MIS**
 - Title: Thematic Unit of Excellence on Soft Nanofabrication with Application in Energy, Environment and Bio-platforms at IIT-Kanpur
 - Amount proposed: Rs. 50,000/-
 - Duration: Five years
 - Starting date (Duration): October 3, 2011
5. **Sponsoring Agency: Indian Space Research Organisation (VSSC-ISRO, Thiruvananthapuram)**
 - Title: Study of parametric sensitivity of water permeation in Fuel Cell Proton Exchange Membranes

- Total Amount: Rs. 20,08,000/-
 - Duration: Three years
 - Starting date (Duration): April 20, 2011 (Three Years, extended for another six months)
6. **Sponsoring Agency: Council of Scientific & Industrial research (CSIR)**
- Title: Mass Transfer Studies Removal of Dissolved Gases from Aqueous Solution applying Membrane Contractor as Degasser
 - Total Amount: Rs. 9,75,000/-
 - Starting date (Duration): August 1, 2010 (Three Years)
7. **Sponsoring Agency: Indo-Australian Bilateral Research Project Funds under the Indo-Australian Fund for S&T Cooperation in Biotechnology (DBT)** Collaborative Organizations: University of Melbourne (PI: Dr. Sally Gras, Co-PI: Dr. Sandra Kentish), Burra Foods (Co-PI: Dr. Andrew Barber, Australia), Jadavpur University (PI: Prof. C. Bhattacharjee) and I.I.T.-Kanpur (Co-PI: Prof. P. K. Bhattacharya, India)
- Title: Milk nutraceutical: a biotechnology opportunity for Australian and Indian dairy producers
 - Total Funding: AUD 530,717 (Indian component: AUD 188,250 (Rs. 6,400, 500) & Australian Component: AUD 342,467).
 - Co-PI at IITK: PK Bhattacharya (project cost: Rs. 12,68,000/-)
 - Starting date (Duration): June, 2007 (3 years & extended to 3.5 years)
8. **Sponsoring Agency: Ministry of Human Resource and Development (MHRD)**
- Title: Engineering thin meso-porous films for development of sensors
 - Total Amount: Rs. 20,00,000/-
 - Starting date (Duration): August 1, 2010 (Three Years)
 - PI: Dr. Rajdip Bandyopadhyaya
 - PI: PK Bhattacharya from April, 2007 to September, 2008
9. **Sponsoring Agency: Indo-French Project from Indo-French Centre for promotion of advanced research (IFCPAR)** Collaborative Organizations: IEM, Montpellier (France) and I.I.T.-Kanpur (India)
- Title: Effluent Treatment through Membrane Processes
 - Total Funding : Rs. 95, 50,000/-
 - French PI : Prof. G. M. Rios, Ecole Nationale Superieure de Chimie, France
 - Indian project cost: Rs. 24,28,000/- plus six visits to France
 - Starting date (Duration): April 2003 to September, 2006 (3 years, extended to 3.5 years)

10. **Sponsoring Agency: Ministry of Human Resource and Development (MHRD)**
 - Title: Advanced Membrane Separations
 - Total Amount: Rs. 15,00,000/-
 - Starting date (Duration): April 2003 (Two Years)
 - Sponsoring Agency: Ministry of Human Resource and Development (MHRD)
 - Title: Membrane Separations
 - Total Amount: Rs. 15,00,000/-
 - Starting date (Duration): February, 1999 (Three Years)
11. **Sponsoring Agency: Khadi and Village Industries Commission (KVIC)**
 - Title: Splitting Machine Cane Juice Extraction'
 - Total Amount: Rs. 3,90,000/-
 - PI: Prof. J. K. Gehlawat & Co-PI: P. K. Bhattacharya
 - Starting date (Duration): 1st April, 1998 (One Year)
12. **Sponsoring Agency: All Indian Council of Technical Education (AICTE)**
 - Title: Membrane Separations Processes (Thrust Area)
 - Total Amount: Rs. 12,00,000/-
 - Starting date (Duration): February 1996 (Three Year)
13. **Sponsoring Agency: Department of Biotechnology (DBT)**
 - Title: High Fructose Syrup
 - Total Amount: Rs. 23,00,000/-
 - Starting date (Duration): 1993 (Three Year)
 - PI: Prof. J. K. Gehlawat & Co-PI: P. K. Bhattacharya

INDUSTRY CONSULTANCY PROJECTS

14. **Sponsoring Industry: M/s GAIL India Ltd. (GAIL, Pata)**
 - Title: Report on Naphtha produced as bye-product of the main product LPG
 - Total Amount: Rs. 2,50,000/-
 - Starting date (Duration): (Four Months)
15. **Sponsoring Industry: Supreme Paper Mills Ltd., Kolkata (SPM)**
 - Title: Analysis and validation of results obtained for the production of Sodium Lignosulphonates from spent sulphite liquor
 - Total Amount: Rs. 3,00,000/-
 - Starting date (Duration): (Six Months)
16. **Sponsoring Industry: Indo-Gulf Fertilizers, Jagdishpur (Aditya-Birla Group)**

- Title: To develop membrane process based scheme in order to recycle urea plant process condensate after recovering Gases (Ammonia and CO₂) and Urea
 - Total Amount: Rs. 21,56,160/-
 - Starting date (Duration): 21st November, 2006 (Two Years)
17. **Sponsoring Industry: DSCL Sugar – AJBAPUR (DSCL)**
- Title: Inspection & advice for efficient performance of the Effluent Treatment Plant
 - Total Amount: Rs. 20,000/-
 - Starting date (Duration): May 2008 (One month)
18. **Sponsoring Industry: Transpek-Silox, Vadodara (a multi-national company manufacturing inorganic chemicals) (TSIL)**
- Title: “To develop a scheme for recycling of TSIL biologically treated effluent (300 m³/day) in order to recover water as well as for any discharge to municipal drainage, adhering pollution norms”
 - Total Amount: Rs. 10,00,000/-
 - Starting date (Duration): 11th August, 2006 (Two Years)
19. **Sponsoring Industry: M/s GAIL India Ltd. (GAIL, Pata)**
- Title: “Separation of light paraffins and olefins by adsorption”
 - Total Amount: Rs. 1, 71, 31,000/-
 - Starting date (Duration): 11th August, 2006 (Two Years)
 - PI: Professor D. P. Rao
 - Coordinator: Prof. P. K. Bhattacharya (2006-2007)
20. **Sponsoring Industry: M/s Raninagar Paper Ltd., C/o M/s Supreme Paper Mills, Calcutta (SPM)**
- Title: “Purification & concentration of liginosulfonates from black liquor by membrane processes”
 - Total Amount: Rs. 3,00,000/-
 - Starting date (Duration): 4th August, 1998 (Two Years)
21. **Sponsoring Industry: M/s Grasim Industries Ltd., Mavoor, Kerala (GRASIM)**
- Title: “Trial Runs of Ultrafiltration of Prehydrolysis Liquor”
 - Total Amount: Rs. 23,750/-
 - Starting date (Duration): August 2000 (Two months)
22. **Sponsoring Industry: M/s Dhampur Sugar Mills, Dhampur (UP)**
- Title: “To develop a membrane based technology for Sugar Processing”

- Total Amount: Rs. 1, 50,000/-
- Co-PI: JK Gehlawat
- Starting date (Duration): 1995 (one year)

23. **Sponsoring Industry: UP-State Agro Industrial Corp. Ltd., Lucknow (UPSAIC)**

- Title: “Techno-economic feasibility study (report preparation) for 10-tones/day-zinc sulphate plant for supply, erection and commissioning on turnkey basis”
- Total Amount: Rs. 10,000/-
- PI: Subhash Bhatia & Co-PI: PK Bhattacharya
- Starting date (Duration): 1986 (Three months)

PLENARY/INVITED LECTURES AND SEMINARS

1. Delivered ‘H.L. Roy Memorial Lecture’ on 25th March, 2018 at Jadavpur University on “An overview of membrane based processes for effluent treatment, organic liquid mixture separation and for facilitating enzymatic reactions”.
2. CSMCRI Chemcon Distinguished Speaker Award for 2016, “Ways to efficiently produce galacto-oligosaccharides from lactose: immobilized enzyme membrane reactor, bioconjugation and development of kinetic models”, at Chennai, December 28, 2016.
3. Distinguished Lectures, in a Short Term Course on Research Methodology, organized by NATIONAL INSTITUTE OF TECHNICAL TRAINING & RESEARCH, CHANDIGARH and Department of Education and Educational Management, for Faculty of Technical Institutions at FGIET, Raebareli during May 09 – 13, 2016. Topic: Research Methodology: A Perspective.
4. Distinguished Lecture, The International Conference titled "International Conference on Advances in Bioprocess Engineering and Technology" (ICABET 2016); January 20-22, 2016 at HIT, Kolkata. Topic: Enzyme immobilization/bioconjugation in producing galactio-oligosaccharidies from lactose: developments of kinetic models and bio-reactors.
5. Invited lecture, Vellore Institute of Technology, Vellore. Invited lecture under Talk @ Green India at GraVITas (Students’ techfest) 25-27 September, 2015.
6. Invited lecture, International Conference on 'Membrane Based Separations" (MEMSEP 2015) organized by Indian Membrane Society & BARC, at Vadodara, 21-23 March 2015. Topic: Membrane application for enzyme immobilization in synthesizing nutraceuticals

7. Keynote speaker, Cognizance 2014, Annual Technical Festival of IIT Roorkee, (on March 21, 2014), A lecture for the all-India participating students of Chemical Engineering. Topic: Membrane Separations - Concepts, Principles and Industrial Applications.
8. Brainstorming meeting, Indo-French Centre for the Promotion of Advanced Research "CEFIPRA- Beyond 25 years" on 21st August, 2013. New Delhi.
9. Invited Lecture: National Seminar on 'Advances in Membrane Processes and Materials (AMPM-13) organized by Indian Membrane Society along with the Applied Chemistry Department, The M. S. University of Baroda on the 6th April 2013 (Saturday). Topic: Advances of Membrane based Processes
10. Keynote Address on "Pervaporation: an emerging separation technique for liquid mixtures", at International Conference on "Water Desalination, Treatment and Management" organized by MNIT-Jaipur in association with Indian Desalination Association (InDA) and CCDU, Public Health Engineering Department (PHED) Rajasthan, Feb. 22, 2013. (could not attend to deliver)
11. Invited Lectures on a national course "Hazardous Waste, Batteries Waste and E-Waste Management" at Chemical Engineering Dept., I.I.T Roorkee from June 11-15, 2012. Topic: Removal of Hazardous Metal ions and Toxic species from Waste-water by Membrane processes Micellar Enhanced Ultrafiltration (MEUF) & Pervaporation.
12. Invited Lecture in a Symposium on "Recent Development in Process Industries" on the occasion of "THERMIC-12" organised by Council of Chemical Engineers at Dr. Ambedkar Institute of Technology for Handicapped U.P., Kanpur during March 22-23, 2012. Topic: Pervaporation, Potential Membrane Technology for Typical Liquid Mixtures Separations.
13. Invited Lecture on the occasion to commemorate the 150th birth anniversary of Pt. Madan Mohan Malviya at Chemical Engineering Department, BHU on March 20, 2012. Topic: Pervaporation, Potential Membrane Technology for Typical Liquid Mixtures Separations.
14. Invited Lecture at "International Conference on Membranes: Environmental and Biological Applications", organized by the Centre for Environment Education and Technology (CEET www.ceetindia.org), Kottayam, Kerala, during Sept.16-19, 2011 in Kottayam, Kerala, India. Topic: Organic-aqueous/organic-organic liquid mixtures separations through pervaporation: emerging membrane based technologies.

15. Invited Lecture on a national course "Environmental Health and Safety Management in Process Industries" at Chemical Engineering Dept., I.I.T Roorkee from January 25-29, 2011. Topic: Membrane Processes for Effluent Treatment.
16. Invited Lecture on "Chemical Engineering: Directions and Opportunities" at MANIT – Bhopal, October 23, 2010.
17. Plenary Lecture on "Typical Liquid Mixtures Separations through Pervaporation: An Emerging Membrane Based Technology" at S-CHEMCON 2010, 6th Annual Session, Students Chemical Engineering Congress 2010, Process Industries & Sustainable Development, 24-25 September, 2010 at RVR & JC College of Engineering, Guntur, Andhra Pradesh.
18. Invited Lecture on "Enzymatic conversion of Lactose in to Galacto-oligosaccharides" at Indo-Australian workshop held at Jadavpur University on 8th December, 2009.
19. Invited Lecture on "Pressure driven membrane processes: Effluent Treatment" at INTERFACE-08 held at HBTI-Kanpur on 12th April, 2008.
20. Invited Lecture on "Pressure driven membrane processes for Effluent Treatment" at Dairy Australian Industries Ltd. (DAIL) at Melbourne, Australia on 19th February, 2008.
21. Invited Lecture on "Pressure driven membrane processes: Principles and Applications" at Department of Chemical Engineering and Bio-molecular Engineering, University of Melbourne, Australia on 19th February, 2008.
22. Invited Lecture on "Pressure driven membrane processes: viable unit operations for effluent treatment" in National Seminar on "Recent Advances in Chemical Engineering Operation and Process in Chemical and Allied Industries, at Institute of Technology, Guru Ghasidas University, February 5-6, 2008.
23. Invited Lecture on "Pressure Driven Membrane Processes for Effluent Treatment", in All India Seminar on Zero effluent discharge- latest development In recycling during 22-23 December, 2007; Organized By The Institute of Engineers (India) West Bengal State Centre Chemical Engineering Division at Kolkata.
24. Invited Lecture on "Pressure Driven Membrane Processes: Phenomena and Design" during 10-14 December 2007 in QIP Short-Term Course at Department of Chemical Engineering, Indian Institute of Technology Guwahati.
25. Keynote Lecture on "Pervaporation: an emerging separation technique for liquid mixtures", during 12-14 December 2007 in National Conference on Frontiers of Chemical Engineering at Department of Chemical Engineering, Indian Institute of Technology, Guwahati.

26. Keynote Address on "Bio-separations and pressure driven membrane separations: an overview", in a Workshop on Biotechnology & Bio-separations (under TEQIP) at department of Chemical Engineering, JNTU College of Engineering, Ananthapur (A.P.) on February 16, 2006.
27. Invited Lecture on "An overview of pressure driven membrane processes", at Z H College of Engineering, Aligarh in Chemical Engineering Department, on January 28, 2006.
28. Invited Lecture in International Harcourtian Meet and Seminar cum Expo 2005 on "Impact of Technical Education on Society", HBTI, Kanpur, November 25, 2005.
29. Invited Lecture at Rotary Club of India – Kanpur Chapter on "Career Counselling", Rotary Club, Kanpur, September 2004.
30. Invited Lecture at Kanpur Institute of Technology (KIT) on "Why Engineering?" KIT, Kanpur, May 2004.
31. Invited Lecture at the Indo-French seminar on "Emerging Technologies for Water and Wastewater Management" at India Habitat Centre, Delhi during February 9-12, 2004.
32. Keynote address at the National Seminar on "Eco-Friendly Chemical Technologies in New Millennium", February 7-8th, 2002, organized by UDCT, Amravati University, and Amravati. Topic: Overview of Membrane Technology for Effluent Treatment.
33. Invited lectures (Six Lectures) for a three-week Refresher Course on 'Membrane Separation Processes' sponsored by UGC; Jadavpur University, Kolkata, July 2-21, 2001.
34. Invited lecture at 'National Seminar on Environmental Pollution and its Control', BITS – Pilani, March 10, 1999. Topic: 'Adoption of membrane processes in water pollution control'.
35. Invited lecture at 'Council of Science and Technology, U.P.' for administrators, planners and scientific community of Lucknow on October, 1999. Topic: 'Advances in Membrane processes for water pollution control'.
36. Invited lecture at 'Regional Labour Institute, Kanpur' in one-day seminar on 'Industrial Environment and its control' on Oct. 14, 1999. Topic: 'Membrane Processes in Handling Industrial Liquid Wastes'.
37. Plenary lecture in the 'National Symposium on Recent Trends in Membrane Transport', IT, BHU, March 19-20, 1998.

38. Invited lecture for XVI National Conference of IMS on 'Controlled Release Polymeric Membranes in Medicine and Agriculture', Karnataka University, Dharwad, April 17-18, 1998.
39. Invited lectures in a short course on 'Membrane and its Applications', Feb. 13-15, 1996; organized by FITT and IIT-Delhi. Topic: Solvent and solute transport through membrane in RO and UF (Part I & II).
40. Plenary lecture at XII National Symposium of Indian Membrane Society, held at Jadavpur University, February 1994. Topic: Flux decline in pressure driven membrane separation processes.
41. Plenary lecture at XIV National Symposium of Indian Membrane Society on, 'Membranes in Chemical and Biochemical Industries', at IIT-Delhi, February 16-17, 1996. Topic: Limiting flux phenomena for pressure driven membrane processes.
42. Invited Seminar on 'Limiting flux in Ultrafiltration with Kraft black liquor', University of Bath, UK, June 1992.
43. Invited lectures (4 hours total) at National Fertilizer Ltd., Vijaypur (MP). "Reverse osmosis/Ultrafiltration/Gas separation with particular reference to pollution abatement", February 24, 1990.
44. Invited Lecture at University College of Technology, Hyderabad (A.P.), "Gas separations using polymeric membranes (National Summer Workshop on 'Membrane Technology'; April 30 - May 1, 1989.

CHIEF GUEST, CHAIRING CONFERENCE SESSIONS AND OTHERS

1. Chairman, Oral presentation, Session VII of ICABET 2016 (International Conference on Advances in Bioprocess Engineering and Technology) on 22nd Jan, 2016 from 11:15 – 1.00 pm. at Heritage Institute of Technology, Kolkata.
2. Member: DST organized 'Brain Storming Session (BSS) and Working Group meeting on management of RO rejects of Leather and Textile Industries and its related issues', 9-10 March 2013 at Centre for Biotechnology, Anna University, Chennai.
3. Chairman of Technical Session on 'Biochemical engineering on (December 29, 2011 Thursday 2.30 PM; IAT Seminar Room; Chair: Prof. Prashant K. Bhattacharya Co-chair: Dr. Mohidus Samad)', "3rd international conference on Chemical Engineering (ICChE-2011) during December 29-30 in Dhaka, Bangladesh".
4. Judge, Students' Poster Presentation, 3rd international conference on Chemical Engineering (ICChE-2011) during December 29-30 in Dhaka, Bangladesh".

5. Chief Guest, inauguration of 'Chemical Engineering Students Association (ChESA) & release of first Newsletter of ChESA' at MANIT – Bhopal, October 23, 2010.
6. Chairman of the Session on 'Biochemical engineering (29th December, 2011)', International Workshop on 'Third International Conference on Chemical Engineering: ICChE-2011' to be held from 29-30 December, 2011 at BUET, Dhaka.
7. Chief Guest of the valedictory function at S-CHEMCON 2010, 6th Annual Session, Students Chemical Engineering Congress 2010, Process Industries & Sustainable Development, 24-25 September, 2010 at RVR & JC College of Engineering, Guntur, Andhra Pradesh.
8. Chairman of Session on 'Hollow Fibre, Capillary Membranes & CO₂ Capture on (8th December)', International Workshop on 'Advances in Membrane Technology for Water Treatment, Environment and Clean Energy' December 7 - 8, 2009, Central Glass & Ceramic Research Institute (CSIR).
9. Chairman of 2nd Technical Session in National Seminar on "Recent Advances in Chemical Engineering Operation and Process in Chemical and Allied Industries, at Institute of Technology, Guru Ghasidas University, February 5-6, 2008.
10. Chairman, Plenary Session during "Overview of Membrane based Effluent Treatment at IIT-Kanpur", in All India Seminar on Zero effluent discharge- latest development In recycling during 22-23 December, 2007; Organized By The Institute of Engineers (India) West Bengal State Centre Chemical Engineering Division at Kolkata.
11. Chairman, Technical Session during "National Conference on Frontiers of Chemical Engineering" at Department of Chemical Engineering, Indian Institute of Technology Guwahati during 12-14 December 2007.
12. Chairman, Technical Session V: Reuse and Recycle of waste water, at the Indo - French Centre Seminar on "Emerging Technologies for Water and Wastewater Management" at India Habitat Centre, February 9-12, 2004.
13. Chairman, Technical Session III, "Eco-Friendly Chemical Technologies in New, Millennium" February 8th, 2002 at UDCT, Amravati University, Amravati.
14. Chairman, Technical Session (TS-4.1) of 'Transport Phenomena – IV (Dec. 19, 1998) at Chemcon-98, 51st annual session of IChE, Vishakhapatnam, Dec. 16-19, 1998.
15. Chairman, Parallel Technical Seminars, CFD and Novel Separation Techniques', (December 17), Golden Jubilee IChE Congress, IIT-Delhi, December 14-18, 1997.
16. Chairman, Technical Session XII, Novel Separation Technique - 2, (December 18), Golden Jubilee IChE Congress, IIT-Delhi, Dec. 14-18, 1997.

17. Chaired a session as well as a panel discussion member in a conference on 'Total Quality Management', held at HBTI, Kanpur, and March 1997. The conference was a part to celebrate platinum jubilee of HBTI, Kanpur.
18. Co-chairman, Technical Session, National Seminar of ISTE on 'Technical Education and the Environment', IIT-Kanpur, January 16-17, 1993.
19. Discussion on the approach and the steps to be taken for conceptualizing and implementing a program on 'Membrane Separations', at national level in collaboration with EEC; organized by DST at UDCT, Bombay on Aug 4, 1990.
20. India-European Community Workshop on Membranes. Discussion organized by DST at New Delhi on November 30 - December 2, 1989.
21. Future perspective of Environmental Engineering and Science in India. Panel discussion/meeting organized by Civil Engineering Department, IIT Kanpur, 1988.
22. Energy Planning and Conservation in Pulp and Paper Industries. Panel discussion organized by National Productivity Council at Calcutta on January 21-22, 1980.
23. Controls in Pulp and Paper Industries. Lecture in a QIP course, organized by Mechanical Engineering Department, IIT Kanpur on 'Instrumentation and process control in industries', December 1979.

MEMBERSHIP IN PROFESSIONAL BODIES

- Life Member - Indian Institute of Chemical Engineers (LM-08991)

RESEARCH MENTOR CUM HOST TO FELLOWS

- Dr. Rajaram Krishna Nagarale, Ramanujam Fellowship from DST, (mentor: Prof. PK Bhattacharya, at Department of Chemical Engineering, I.I.T.-Kanpur). For a period of 5-years from March 1, 2012 (fellowship: Rs. 85,000/- p.m. & Rs. 7,00,000/- per annum research grant).
- Dr. Kashyap Kumar Dubey (Associate Professor in Biotechnology, University Institute of Engg. & Technology, M.D. University Rohtak, Haryana), TEQIP Fellow, TKIC sponsored Summer Visiting Researcher Program at IIT Kanpur. Duration: Six weeks from June-July 2014
- Mr. Ashwani Kumar Rathore (Assistant Professor Chemical Department HBTI, Kanpur) KIT Winter Visiting Researcher Program 2015; December 01 to 23, 2015.

GRADUATED RESEARCH STUDENTS PURSUING ACADEMICS

1. **Sirshendu De:** BTP-1989, M.Tech. thesis-1992, Ph.D. thesis-1996
Present position: **Professor, dept. of Chemical Engineering, I.I.T.-Kharagpur**
Honours: **SS Bhatnagar Award-2011, FNAE-2011, Herdillia-2010, etc**
2. **Subir Bhattacharjee:** M.Tech. thesis – 1990, Ph.D. thesis-1995
Present position: **Professor, Dept. of Mechanical Eng, Univ. of Alberta, Canada**
Director, Oil Sands and Coal Interfacial Eng Facility
Honours: **NSERC Industrial Research Chair Professor; Canada;**
Research Chair; Written a book titled 'Electrokinetic and Colloid
Transport Phenomena', etc
3. **S.V. Satyanarayana:** M.Tech. thesis – 1991, Ph.D. thesis-2003
Present position: **Head, Dept. of Chemical Eng, JNTUCE Anantapur (AP);**
Chairman, PG Board of Studies.
Honours: **Director, SCDE and Director, Industrial Relations & Placements**
4. **Sunando Dasgupta:** M.Tech. thesis – 1987
Present position: **Professor, Dept. of Chemical Eng, I.I.T.-Kharagpur &**
Associate Dean, Sponsored Research & Industrial Consultancy
Honours: **FNAE-2009, Herdillia-2009**
5. **C. Bhattacharjee:** M.Tech. thesis – 1990
Present position: **Head & Professor, Dept. of Chemical Eng, Jadavpur University**
Honours: **Written a book titled, 'Liquid Membranes: Principles and Applications in**
Chemical Separations and Wastewater Treatment' (Elsevier B.V.
2010), AICTE Best project national award (1st prize-2006), etc.
6. **Somenath Ganguly:** M.Tech. thesis – 1991
Present position: **Professor, Dept. of Chemical Eng, I.I.T.-Kharagpur**
7. **Sujoy Chattopadhyay:** M.Tech. thesis – 1994
Present position: **Associate Professor, Dept. of Chemical Eng, I.I.T.- Roorkee**
8. **U.V.S. RamaGopal:** M.Tech. thesis – 1998
Present position: **Associate Professor, Dept. of Chemical Eng, I.I.T.- Guwahati**
9. **Sameer Ralph Jadhav:** M.Tech. thesis – 1998
Present position: **Associate Professor, Dept. of Chemical Eng, I.I.T.-Bombay**
10. **Gargi Ghosh:** M.Tech. thesis - 2002
Present position: **Asstt. Prof., Univ. of Michigan, Dearborn College of Eng &**
Computer Sci., Dept. of Mechanical Eng, USA

11. **Mrinal Kanti Mondal:** Ph.D. thesis-2007
Assistant Prof., Dept. of Chemical Eng, N.I.T.- Durgapur
12. **Tapas Palai:** Ph.D. thesis-2015
Assistant Prof., Dept. of Chemical Eng, B.I.T.-Mesra, Ranchi

SERVICE TO PROFESSION

Member Selection Committee – Visitor’s Nominee/Director/ Dy. Director/ Faculty & Scientist

- For selection of Director, L.I.T.-Nagpur, Nagpur University
- Visitor’s nominee, faculty selection, Alternate Hydro Energy Centre (AHEC) Indian Institute of Technology Roorkee.
- Chancellor’s nominee, faculty selection, Mahamana Madanmohan Maliviya University of Science and Technology, Gorakhpur
- Deputy Director (Safety) in chemical Engineering, UPSC
- I.I.T.-Delhi (Indian Institute of Technology - New Delhi)
- I.I.T.-Kharagpur ((Indian Institute of Technology - Kharagpur)
- I.I.T.-Patna ((Indian Institute of Technology - Patna)
- I. I. T. – Roorkee (Indian Institute of Technology - Roorkee)
- I.I.T.- Hyderabad (Indian Institute of Technology - Hyderabad)
- I.T.-BHU ((Institute of Technology - Varanasi)
- Jadavpur University (Kolkata)
- Calcutta University (Kolkata)
- CSMCRI (Central Salt & Marine Chemicals Research Institute – Bhavnagar (Gujarat)
- N.I.T. Surat (Sardar Vallabhbhai National Institute of Technology - Surat)
- N.I.T. Surthakal, Karnataka
- Rajiv Gandhi University of Knowledge Technologies, Hyderabad
- RGIPT – (Rajiv Gandhi Institute of Petroleum Technology - Raebareli)
- B.I.T. (Birla Institute of Technology) Mesra, Ranchi
- THAPAR UNIVERSITY Patiala (Punjab)
- Motilal Nehru National Institute of Technology (Allahabad) – invited
- DCR University of Science & Technology, Murthal, Sonapat, Haryana – invited
- Expert Member- Other Selection Committees
- MHRD Member, Selection committee for Commonwealth School, New Delhi
- Member - Fellow, Plan; Nehru Centenary British Fellowship Awards Scheme;

- Member - Selection committee UP State Polytechnic Institutes in Chemical Engineering.

Member: Education/Research/Award Committee

- Member, Administrative Committee, Joint Entrance Examination Council, U P, Lucknow
- Member Expert, V. N. M. M. Award of I.I.T.-Roorkee
- Member, Board of Studies, Department of Chemical Engineering, IT-BHU, Varanasi.
- UGC Expert, Centre for Advanced Studies, Department of Chemical Engineering, IT-BHU, Varanasi.
- Member Expert, Khosla National Award of I.I.T.-Roorkee
- Member, Board of Studies in ChE, Gautam Buddha Technological University, Lucknow
- Expert Member: Review of NPTEL web course, IIT-Guwahati
- Member (2010-2011), Research Degree Committee (RDC) of Applied Chemistry/Chemical Technology/Chemical Engineering, GB Technical University, Lucknow
- Expert Member, Dr. D. S. Kothari Postdoctoral Fellowship Scheme, UGC
- Expert Member, CSIR young Scientist Award
- Member, Board of Chemical Engineering Studies – MA N.I.T. Bhopal.
- Member, Senate- N.I.T. Surat (S.V. National Institute of Technology - Surat).
- Member (2006 -) - Advisory Board, National Sugar Institute Kanpur.
- Member (2003 - 2006): Board of Studies for Chemical Engineering, UP Technical University, India.
- Member (2009 - 2011): Board of Studies for Chemical Engineering, H.B.T.I.-Kanpur.

REVIEWER OF JOURNALS

- | | | |
|-----|---|--------------------------------|
| 1. | ACS Applied Materials & Interfaces | (ACS Paragon Plus Environment) |
| 2. | American Institute of Chemical Engineering Journal (American Inst ChE, Society) | |
| 3. | Arabian Journal of Chemistry | (Elsevier) |
| 4. | Asia-Pacific Journal of Chemical Engineering | (Wiley Online Library) |
| 5. | Bioprocess and Biosystems Engineering | (Springer) |
| 6. | Bio Resources Online Journal | (NC State University, Raleigh) |
| 7. | Biotechnology Progress | (Wiley-VCH) |
| 8. | Biochemical Engineering Journal | (Elsevier) |
| 9. | Canadian Journal of Chemical Engineering | (Wiley Online Library) |
| 10. | Carbohydrate Polymers | (Elsevier) |

11. Chemical Engineering Communications (Taylor & Francis, Inc.)
12. Chemical Engineering Journal (Elsevier)
13. Chemical Engineering Science (Elsevier)
14. Chemical Engg Processing: Process Intensification (Elsevier)
15. Chemical Engineering & Technology (Wiley-VCH)
16. Chemical Industry & Chemical Engineering Quarterly (Assoc ChE, Belgrade, Serbia)
17. Chemical Product and Process Modelling (The Berkeley Electronic Press)
18. Chimica Oggi (TEKNOSCIENZE Srl, Italy)
19. CLEAN - Soil, Air, Water (Wiley Online Library)
20. Colloids & Surfaces A: Physicochemical Engg Aspects (Elsevier)
21. Computers and Chemical Engineering (Elsevier)
22. Current Science (Indian Academy of Sciences)
23. Desalination (Elsevier)
24. Desalination and Water Treatment (Taylor & Francis)
25. Environmental Technology (Taylor & Francis)
26. Enzyme and Microbial Technology (Elsevier)
27. European Polymer Journal (Elsevier)
28. Indian Chem. Engineer (Indian Institute of ChE, Society)
29. Indian Journal of Chemical Technology (CSIR-NISCAIR Online Periodicals)
30. Industrial Engineering Chemistry & Research (ACS Paragon Plus Environment)
31. Food and Bio-products Processing (Elsevier)
32. International Journal of Hydrogen Energy (Elsevier)
33. International J Environmental Analytical Chemistry (Taylor & Francis)
34. International J Environment and Waste Management (INDERSCIENCE Publishers)
35. International Journal of Heat & Mass Transfer (Elsevier)
36. International Scholarly Research Notices_ open access journal (Hindawi Publishing Corporation)
37. Journal of Agricultural and Food Chemistry (ACS Paragon Plus Environment)
38. Journal of Agricultural Science and Technology (Tarbiat Modares University, Iran)
39. Journal of Applied Polymer Science (Wiley Online Library)
40. Journal of Bioinformatics and Sequence Analysis (Academic Journals – Open Access)
41. Journal of Chemical Technology & Biotechnology (Wiley online library)
42. Journal of Colloid & Interfacial Science (Elsevier)
43. Journal of Electrochemical Society (Electrochemical Society Journals)
44. Journal of Industrial and Engineering Chemistry (Elsevier)

45. Journal of Environmental Management (Elsevier)
46. Journal of Food Engineering (Elsevier)
47. J Institution of Engineers (India): Series E (Aries Systems Corporation)
48. Journal of Hazardous Materials (Elsevier)
49. Journal of Membrane Science (Elsevier)
50. Journal of Molecular Catalysis B: Enzymatic (Elsevier)
51. Journal of Scientific Research and Reports (SCIENCEDOMAIN international)
52. Journal: Waste Management (Elsevier)
53. Langmuir (ACS Paragon Plus Environment)
54. Nuclear Engineering and Design (Elsevier)
55. Periodica Polytechnica Chemical Engineering (Budapest University of Technology and Economics)
56. Polymer (Elsevier)
57. Polymer Composites (Wiley online library)
58. Polymer Engineering & Science (John Wiley & Sons)
59. Process Biochemistry (Elsevier)
60. Separation and Purification Technology (Elsevier)
61. Separation Science Technology (Taylor & Francis)
62. The Korean Journal of Chemical Engineering (Springer)
63. Water Science and Technology (International Water Association, IWA)
64. Water Research (Elsevier)

Book/Handbook

- Handbook on Membrane Separations (Marcel Dekker)

Conference

- International Conference on Chemical Engineering and Applications–CCEA 2013 (Round-I)
- CHEMCON

Reviewer: courses

- NPTEL Web Course on Mass Transfer Operations for I.I.T.-Guwahati
- NPTEL Web Course, 'Environmental Engineering' for I.I.T.-Roorkee

Reviewer/Evaluator: Projects/Proposals/Patents

- Indo-US Science & Technology Forum
- Indo-French Centre for the Promotion of Advanced Research (IFCPAR)
- Indo-German Science & Technology Centre (IGSTC)

- DBT (Department of Biotechnology, GOI)
- DST (Department of Science & Technology, GOI)
- DSIR (Dept. of Scientific & Industrial Research, GOI)
- CSIR (Council of Scientific & Industrial Research – GOI)
- Dr. D. S. Kothari Postdoctoral Fellowship Scheme in Sciences under UGC
- CST (Council of Science & Technology, UP)
- CST (Council of Science & Technology, Rajasthan)
- MHRD / AICTE.
- I.I.T.-Kanpur

Ph. D. Thesis Examiner

- I. I. Sc. Bangalore
- I. I. T. Bombay
- I. I. T. Delhi
- I. I. T. Kharagpur
- I. I. T. Madras
- I.I.T. – Roorkee
- I. I. T. Kanpur
- I.I.T.-BHU & I.T.-BHU –Varanasi
- Aligarh Muslim University, Aligarh
- Anna University, Coimbatore
- CSJM University, Kanpur
- Jadavpur University, Kolkata, West Bengal
- Jawaharlal Nehru Technological University, Anantapur (A.P.)
- L.I.T., Nagpur University (Rashtrasant Tukadoji Maharaj Nagpur University)
- N. I. T. – Durgapur
- N. I. T. Karnataka – Surathkal
- Osmania University, Hyderabad, Andhra Pradesh
- Pondicherry University, Pondicherry
- TERI-University (Tata Energy Research Institute, New Delhi)
- Gautam Buddh Technical University, Lucknow
- University of Kerala, Thiruvananthapuram
- University of Calcutta

- Vidyasagar University, Midnapore 721 102, West Bengal

Service for National Board of Accreditation (NBA)

Expert Member, NBA of All India Council for Technical Education (AICTE). Member of NBA for following Institutes:

1. BIT – Sindri (Jharkhand)
2. RVR Engineering College, Guntur (Andhra Pradesh)
3. Haldia Institute of Technology, Haldia (West Bengal)
4. Kongu Engineering College, Perundurai (Tamil Nadu)
5. National Institute of Technology Karnataka, (Surathkal)
6. National Institute of Technology Tiruchirapalli, (Tamil Nadu)
7. L. D. College of Engineering, Ahmedabad, (Gujarat)
8. BV Raju Institute of Technology, Medak, (Andhra Pradesh)
9. Raipur Institute of Technology, Raipur (Chhattisgarh)
10. Gandhi Institute of Technology, Gunupur (Orissa)
11. SVPK Dwarkadas J. Sanghvi College of Engineering, Mumbai (Oct 12-14, 2012)
12. Maharashtra Institute of Technology, Pune (January 30 to February 1, 2015)
13. GMR Institute of Technology, Rajam, Sikakulam (September 4-6, 2015)

ORGANIZING/SCIENTIFIC COMMITTEE: CONFERENCE/SYMPOSIUM

1. Member of the National Advisory Committee for an International Conference on Technologies for Biocoverion of Lignocellulosics into Value-added Products (LignoBioCon-2017)” organized by Central University of Haryana, Mahendergarh, Haryana, India, April 19-21, 2017.
2. Member, International Advisory Committee, International conference: “Challenges and Prospects of Petroleum Production and Processing Industries”, organized by the Department of Petroleum Engineering, Indian School of Mines, January 12-14, 2017.
3. Member, National Advisory Committee, International Conference on Advances in Bioprocess Engineering and Technology-ICABET 2016, organized jointly by the Department of Chemical Engineering and the Department of Biotechnology, Heritage Institute of Technology, Kolkata from January 20-22, 2016.
4. Advisory Committee Member, 69th CHEMCON-2016, Indian Institute of Chemical Engineers (IChE) organized by Chennai Regional Centre at the Department of Chemical Engineering AC

Tech Anna University and the Central Leather Research Institute (CLRI), December 27th - 30th, 2016.

5. Member, National Advisory Committee, International Conference on Direct Digital Manufacturing and Polymers (ICDDMAP-2015) during 28th to 31st October, 2015 at Karnatak University, Dharwad.
6. Member, Advisory Committee, International Conference on 'Membrane Based Separations" (MEMSEP 2015) organized by Indian Membrane Society & BARC, at Vadodara, 21-23 March 2015.
7. Member, Technical Committee, 6th International Conference on Chemical Engineering and Applications (CCEA 2015) August 27-28, 2015, Hong Kong.
8. Member, advisory committee, International Conference on 'Membrane Based Separations" (MEMSEP 2015) during 21-23 March 2015, jointly organized by Indian Membrane Society & Bhabha Atomic Research Centre to be held in Pune, India.
9. Member, national advisory committee, international conference on 'New Frontiers in Chemical, Energy and Environmental Engineering (INCEEE)', during March 6-7, 2015, to be held at the Department of Chemical Engineering, National Institute of Technology, Warangal, India.
10. Member, National Organizing Committee, Trombay Symposium on Desalination and Water Reuse (TSDWR-2015), organized by Board of Research in Nuclear Sciences (BRNS) and Indian Desalination Association (InDA), January 22-23, 2015.
11. Member, Technical Committee, 5th International Conference on Chemical Engineering and Applications (CCEA 2014) August 26-27, 2014, Taipei, Taiwan.
12. Technical Committee Member, 4th International Conference on Chemical Engineering and Applications (CCEA 2013) Paris, France, October 12-13, 2013.
13. Panel Member, National Scientific Committee of Indian Water Congress 2014: National Conference on "Resource recovery, Water Reuse and Recycle for Sustainable Development" during 7-8 February, 2014 at Department of Chemical Engineering, G H Patel College of Engineering & Technology, Vallabh Vidyanagar, Anand, Gujarat.
14. Member Advisory Committee, International Conference on "Water Desalination, Treatment and Management" organized by Malaviya National Institute of Technology (MNIT) Jaipur in association with Indian Desalination Association (InDA) an affiliate of International Desalination Association, and CCDU, Public Health Engineering Department (PHED) Rajasthan, is during Feb.21-22, 2013 at Jaipur.
15. Member of Scientific Committee of "International Scientific Conference on Pervaporation, Vapor Permeation and Membrane Distillation", 8 - 11 September 2011, Toruń, (Poland).

16. Member, International Advisory Committee – “International Conference on Membranes: Environmental and Biological Applications”, organized by the Centre for Environment Education and Technology (CEET www.ceetindia.org), Kottayam, Kerala, during Sept.16-19, 2011 in Kottayam, Kerala, India.
17. Member, Advisory Committee - International Conference - IEEE International Conference on Process Automation, Computing and Control (IEEEPACC2011) 20-22, July at Coimbatore Institute of Technology, India.
18. Member, External Advisory Committee, S-CHEMCON 2010, 6th Annual Session, Students Chemical Engineering Congress 2010, Process Industries & Sustainable Development, 24-25 September, 2010 at RVR & JC College of Engineering, Guntur, Andhra Pradesh.
19. Member of the Advisory Committee, National Conference on “Biotechnology and the Environment”, organized by Department of Biotechnology, National Institute of Technology, Durgapur, 4 & 5th October 2010.
20. Member of Scientific Committee of “International Scientific Conference on Pervaporation and Vapour Permeation [PERMEA-2010 - Membrane Science and Technology Conference of VISEGRAD Countries]”, April 18-21, 2010, Torun (Poland).
21. Patron - ChEmference-08, An annual conference organized by research students of Chemical Engineering Department at I.I.T.- Kanpur to provide a platform for All India research scholars to share their research work experience.
22. Member, National Advisory Committee, “Innovative Developments in Engineering Applications (IDEA-07) under ISTE Chapter held on 2nd and 3rd March 2007 in the Bhai Gurdas Institute of Engineering & Technology, Sangrur (BGIET).
23. Convener of IChE (Kanpur Regional Centre), Golden Jubilee conference on ‘Membrane and hybrid technology for sugar, distillery, paper, tannery and other small scale process industries at IIT Kanpur, Oct., 1998 (proposed).
24. Member, Scientific organizing committee, XIV national symposium of Indian Membrane Society on ‘Membranes in Chemical and Biochemical Industries’, IIT-Delhi, Feb.16-17, 1996.
25. Member of the organizing committee of the national workshop on ‘Causes and prevention of accidents in chemical engineering process industries’ under the joint auspices of Kanpur regional centre and the Chemical Engineering Department, IIT Kanpur, on March 3-4, 1990.
26. Member, organizing committee, ICACE, held at IIT-Kanpur, Jan. 4-6, 1989.
27. Member of the organizing committee of the national seminar on ‘Rural development’, on May 3-4, 1986.

28. Member of the organizing committee of the National seminar on 'Alcohol based industries' at IIT Kanpur, March, 1986.

LABORATORY DEVELOPMENT

Specialized Experimental Set-ups (Designed and Fabricated)

- Membrane Contactor - Hollow Fibre Membrane Module Experimental Set-up: Two complete set-ups with imported Membrane Contactor from Celgard® having all accessories for studies under both the modes; LLE, Sweep/Vacuum.
- Pervaporation: Two full-fledged experimental set-ups on pervaporation completely designed, fabricated and installed. This includes pervaporate condensation through liquid nitrogen

Other Equipment/Set-up (Designed and Fabricated)

- Precision Membrane Casting Unit
- Electro-osmosis unit
- Enzymatic (immobilized) Membrane batch Reactor (EMR)
- Hydraulic press (2 ton capacity)
- Liquid membrane supported unit for separation through facilitated transport
- Experimental set-ups with stainless steel UF/RO cells
- Stirred batch (450 mL, 600 mL)
- Radial cross flow (40 mm dia, 76 mm dia)
- Rectangular thin channel cross flow (6 cm x 40 cm)
- Three 250 mL stirred reactors of stainless steel
- Multi-component ED cells
- Dialyser
- Pyrolysis reactor
- Lamella settler
- Mini Pilot Plant, etc.
- RO/UF spiral wound membrane modules pilot plant with automatic controls (Self Designed; Manufacturer: Permionics, India)
- One bench scale set-up (Plate & Frame module) for RO (courtesy: Hydranautics India Ltd.).

High Precision Instruments/Equipment

- Electrochemical property analyzer (CH Instruments)
- Capillary Condensation porometer/ Gas permeability Tester (PMI-USA): measuring permeability, pore size, etc.
- High Performance Liquid Chromatograph (WATERS®, Shimdtzu®)

- Atomic Absorption Spectrophotometer (Bucknell, USA)
- Membrane casting unit (Pune, India)
- Digital Refractometer of 5-decimal accuracy (Atago, Japan)
- UV-spectrophotometer-1601 (Perkins Elmer - USA, Hitachi & Shimadzu, Japan) & (Systronics, USA)
- Gas Chromatographs (Nucon, India) & (AIMIL, India)
- Aqualatic BOD analyzer (Germany)
- Ion-meter (5-Star from Orion & ISTEK-Korea)
- Water Quality Analyzer (Eutech Instruments, Singapore)
- COD reactor (Hach, USA)
- Colorimeter (Hach - USA)
- Turbidity Meter (Hach – USA)
- Pervaporator (pervasep,USA)
- DBX-50 digital Refractometer with two decimal accuracies (Atago, Japan)
- Water Testing Analyzer
- Milli – Q water purification unit (Millipore, France)
- Remi high speed centrifuge.

Imported Equipment

- Automatic Film Applicator (BYK Gardner, Germany)
- Table Top Membrane Casting Machine – Designed and fabricated from ‘Sigma Industries, Pune’ with the specifications: SIZE: A4, S.S. 316 Scraped Surface Plate as Bed, within 20-30 Micron, Inverted Gantry Type Motorised Movement, D.C. motor with speed control as drive, Digital dial for gap measurement, Power required: 230 v AC., 300W. All critical parts are in S.S. 316 material
- Laminar flow Channel - for strain culture to enzymes, etc
- RO/UF experimental set-up with radial cross flow cell (Berghoff, Germany)
- RO/UF completely equipped experimental set-up from DSS (Denmark)
- UF batch stirred cells (Chem. Lab., UK and Schliecher-Schull, Germany)
- ED experimental set-up with multi-component cells (Berghoff, Germany)
- Several reciprocating high pressure pumps
- Parr reactor (Parr-USA).

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