RESUME

Current Address (2012-2017):

Dr. Santosh K. Gupta
Distinguished Professor
Department of Chemical Engineering
University of Petroleum Studies (UPES)
Energy Acres, Bidholi, *via* Prem Nagar
Dehradun, Uttarakhand 248007

Earlier (1973-2012):

Dr. Santosh **Kumar Gupta**
Professor (superannuated)
Department of Chemical Engineering
Indian Institute of Technology
Kanpur 208016, INDIA

PERSONAL DATA

Date of Birth	July 19, 1946
Marital Status	Married (wife deceased); two children (both married)

ACADEMIC EXPERIENCE

July 2012 – Present	Distinguished Professor Department of Chemical Engineering University of Petroleum & Energy Studies (UPES), Bidholi Dehradun 248007, India
Summer 2011	Visiting Professor of Chemical Engineering University of Western Ontario, London, ON, Canada
2008-10	Visiting Professor (also, L&T Chair Professor, Dec 2009-June 2010) Department of Chemical Engineering Indian Institute of Technology Bombay, Powai, Mumbai 400076, India
1973 – June 2012	Professor (1980 - present) Assistant Professor (1973-1980) Department of Chemical Engineering Indian Institute of Technology, Kanpur India

1987 - 1989	Head, Department of Chemical Engineering Indian Institute of Technology, Kanpur
1999-2000	Visiting Professor of Chemical Engineering University of Wisconsin, Madison, USA
1998 - 1999	Visiting Professor of Chemical Engineering National University of Singapore, Singapore
Summer 1990	Visiting Professor of Chemical Engineering University of Wisconsin, Madison, USA
1985 - 1987	Visiting Professor of Chemical Engineering University of Notre Dame, Notre Dame, USA
1972 - 1973	Post Doctoral Fellow with Prof. W.C. Forsman Department of Chemical Engineering University of Pennsylvania, Philadelphia, USA
1972, 1970	Ph.D. (Chemical Engineering) and M.S. University of Pennsylvania, Philadelphia, U.S.A. Straight A in courses Advisor: Professor W.C. Forsman
1968	B.Tech. (Chemical Engineering) Indian Institute of Technology, Kanpur, India Rank 1 among 200 graduating students of *all* Departments (Class Valedictorian); GPA 9.9/10

RESEARCH INTERESTS

Bio-mimetic approaches in genetic algorithm and simulated annealing; Multi-objective optimization; Polymerization reaction engineering; Fluid mechanics and applications. Author of several textbooks, research monographs, review articles and over 200 research articles (see list). Taught a *wide* range of Chemical Engineering and Continuing Education courses and guided several M. Tech. and Ph. D. students.

AWARDS AND HONORS

2017 Hirsch's *h-index* of 33 (33 papers have over 33 citations each) as of Jan 2017
Total No. of citations: 4358

http://scholar.google.co.in/citations?hl=en&user=QP1IzB4AAAAJ&pagesize=100&view_op=list_works&cstart=200

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15-16 and 06-08 Council Member, The National Academy of Sciences, India (NASI), Allahabad.

2016 Lecture titled "Deepak Kunzru, Prashant Bhattacharya and Ashok Khanna: Reminiscences", Symposium titled 'Challenges in Chemical Engineering', IIT Kanpur, 11 Sep 2016.

2014 Delivered the 2013-14 Kuloor Memorial Lecture in Chemical Engineering, Indian Institute of Science, Bangalore, "Multi-objective Optimization (MOO) using Bio-mimetic Adaptations of Genetic Algorithm (GA)," 03 April 2014.

2014 Member of the 3-Member ***National*** (MHRD) Committee for the ***External*** review of the Departments at ***IIT Delhi***, 13-14 Feb (ChE Department and the Center of Polymer Science and Engg) and at ***IIT Roorkee***, 12 April 2014 (ChE Department).

2013 Member of Advisory Committee on the future growth of all four ChE Departments of ***BITS-Pilani*** campuses (Pilani, Goa, Hyderabad and Dubai), 28-29th Aug 2013.

2011 Festschrift Sessions (two) "*In Honor of Santosh K. Gupta*" in the Catalysis and Reaction Engineering Division, AIChE Annual Meeting, Minneapolis, 18 Oct 2011.

2011 Honoree, *Festschrift issue*, Polym. Eng. Sci. (Volume 51, No. 10, 2011; an SPE–USA/Wiley journal).

2010 IIChE's Deepak Group's Padma Bhushan Prof. L. K. Doraiswamy CHEMCON Distinguished Speaker Award.

2010 Professor B. D. Tilak Visiting Fellowship, UDCT/ICT Mumbai: including a seminar titled "Polymerization Reaction Engineering: a Personal Journey", April 2010.

2009 L & T Chair Professor of Chemical Engineering, IIT Bombay (Dec 2009-June 2010).

2009 Elected *Fellow, Indian National Academy of Engineering,* New Delhi.

06-13 Member, Sectional Committee (Physical Sciences) for Fellowships/ Memberships/NASI Young Scientist Platinum Jubilee Awards, The National Academy of Sciences, India (NASI), Allahabad.

2005 Elected *Fellow, The National Academy of Sciences, India,* Allahabad.

1987 Elected *Fellow, Indian Academy of Sciences*, Bangalore.

1987 *Herdillia Award* of the Indian Institute of Chemical Engineers, for Excellence in Basic Research in Chemical Engineering.

1989 *Mrs. Chinnamaul Memorial Prize* of the Indian Institute of Chemical Engineers for the Best Technical Paper presented at the 41st Annual Meeting of IIChE at Baroda in Dec 88.

1997 *ISTE Visiting Teacher*, gave 6 lectures each at 5 different departments in India.

1998 Part of ISI, Philadelphia's list of 10,885 Chemical Scientists in the world who have Received over 500 Citations in the period 81-97 (Rank 6734).

Received 1579 Citations (ISI, Philadelphia) for 179 Items till 2004 (Average Cites/Item = 8.82).

2004 One paper (Rajesh et al.) included (32nd in the list) in the 95 Most-Cited I&EC Research Publications' (of the last five years).

2005 Hikal's CHEMCON Distinguished Speaker Award of the Indian Institute of Chemical Engineers.

2007 Professor N. N. Godbole Memorial University Lecture at IT, BHU, Varanasi.

and several more Plenary and Keynote Lectures

1969 Elected *Member, Phi Lambda Upsilon,* Honorary Chemical Society, U.S.A.

1968 *President of India's Gold Medal* for the Best Outgoing Student in the Institute (Valedictorian), IIT Kanpur.

1968 *Best Student Prize* in Chemical Engineering, IIT Kanpur.

1968 *Best Project Prize* in Chemical Engineering, IIT Kanpur.

1968 *Dryden Award* for Chem.Eng. Process Design, IIT Kanpur.

1964 *Davenport Prize* in Freshman Chemistry, IIT Kanpur.

1963 *Stood Fifth* in the State of U.P., India, in the Intermediate Examination (12th grade).

1961 *Thresham Medal* for Mathematics, Boys' High School, Allahabad, India.

1994 *ISTE-IPCL National Award (1st Prize*) of the Indian Society for Technical Education, for the Best M.Tech. Thesis in Chem.Engg. (awarded to T. Srinivas).

1995 *ISTE-IPCL National Award (2nd Prize)*, of the Indian Society for Technical Education, for the Best M.Tech. Thesis in Chem.Engg. (awarded to V. Dua).

1997 *ISTE-IPCL National Award (2nd Prize)*, of the Indian Society for Technical Education, for the Best M.Tech. Thesis in Chem.Engg. (awarded to S. Garg).

2001 NSTB, Singapore, Gold Medal for the Best Research Project in the Master of Engineering program in Chemical Engineering at NUS, Singapore, 2000-01 (awarded to M. Engg. Student, V. Bhaskar).

2007 *ISTE-IPCL National Award (2nd Prize)*, of the Indian Society for Technical Education, for the Best M.Tech. Thesis in Chem.Engg. (awarded to Gurpreet J. Singh).

2016 IIChE's Chemical Weekly Award/NRC Award/Kuloor Memorial Award for the best paper (of Pushkar Varshney, et al.) published in Indian Chemical Engineer in 2015

REFEREE of RESEARCH PAPERS for

AIChEJ (American Inst. Chem. Engrs.)
Asia-Pacific Journal of Chemical Engineering (Wiley-VCH)
Chemical Engineering and Processing (Elsevier)
Chemical Engineering Education (Amer. Soc. Eng. Educ.)
Chemical Engineering Journal (Elsevier)
Chemical Engineering Research & Design (IChemE, UK)
Chemical Engineering Science (Pergamon)
Chemical Physics (North Holland)
Chemical Product and Process Modeling (Berkeley Electronic Press)
Computer Methods in Applied Mechanics and Engineering (Elsevier)
Computers and Chemical Engineering (Pergamon)
Heat Transfer Engineering (Taylor and Francis)
IEEE Transactions on Evolutionary Computation
Industrial and Engineering Chemistry Research (Amer. Chem. Soc.)
Information Sciences (Elsevier)
Instruments Society of America Transactions
International Journal of Chemical Reaction Engineering (IJCRE)
International J. Mineral Processing (Elsevier)
International J. Computers and Applications (ACTA Press, Calgary)
Journal of Applied Polymer Science (Wiley, NY)
Macromolecular Theory & Simulations (Wiley-VCH)

Polymer Engineering and Science (Soc. Plastics Engrs., USA)
Polymer (UK)
Polymer International (UK)
Current Opinions in Chemical Engineering (Elsevier)
International Journal of Chemical Engineering (Hindawi)
Indian Chemical Engineer (Indian Inst. Chem. Engrs.)
Indian Journal of Technology (CSIR)
J. Indian Institute of Science

OTHER ACTIVITIES (only some given)

Member, Scientific Advisory Committee, National Symposium on Multiphase Flow (NSMF 2016) at NIT Durgapur, 14-18 Feb 2016.

Nominated by NASI, Allahabad, to the Governing Council of the Indian National Academy of Engineering (INAE), New Delhi, 2016-2018.

Member, National Joint Science Education Panel of the three Science Academies in India: Annual Meeting at the Raman Research Institute, Bangalore, 2014-16.

Faculty Selection Committee [as the President of India's (Visitor's) Nominee]: Chemical Engineering, IIT Madras, 2013-16.

Faculty Selection Committee [as the President of India's (Visitor's) Nominee], including for Chair Professors: Chemical Engineering, IIT Bombay, 2015- .

Faculty Selection Committee: Chemical Engineering, RGIPT Rae Bareli, Feb 2015.

Member, External Review Committee for the Chemical Engineering Departments, IIT Delhi and IIT Roorkee, Feb, April 2014.

Six-day DST-SERB (with UPES collaboration) School on 'Evolutionary Techniques for the Optimization of Chemical Engineering Systems' at UPES DDN, Mon 24 March to Sat 29 March 2014.

Foundation Day Lecture, IIT Kanpur: "Challenging Problems in Examinations", 02 Nov 2013.

Energy Systems Modeling, Optimization and Control (ESMOC-2013), International Conference, NIT Durgapur: "Genetic Algorithm- (GA-) Based Multi-Objective Optimization (Keynote Lecture)", 09-11 Dec 2013.

TEQUIP Workshop in Materials and Chemical Science and Engineering, "Challenging Problems in Examinations", IIT Kanpur, 22 Feb 2014.

Member, Institute Strategy & Planning Committee (ISPC), IIT Bombay, July 2009-June 2010; Institute Colloquium Committee, IIT Bombay, 2009-2010; Member, Institute International Relations Advisory Committee, IIT Bombay, 2009-2010.

Co-Coordinator, SERC School on Optimization Techniques for Chemical Engineering Applications, IIT Bombay, July 06 – 11, 2008.

Vice Chairperson, VIDYA-Mumbai (an NGO for the upliftment of less privileged people), Aug 2008 – July 2009.

Member, Editorial Board, Intl. J. Chem. Reaction Engineering, 2005-2014.

Member, Editorial Board, Journal of Polymer Engineering (UK), 1995-2014 (SCI Journal Impact Factor for 1997 was 0.676).

Member, Editorial Board, Indian Chemical Engineer (Transactions Ind. Inst. Chem. Engrs.), Jan 1994 - Dec 1995.

Co-Coordinator, SERC School on Newer Optimization Techniques for Chemical Engineering Applications, IIT Kanpur, June 09 – 14, 2008.

Co-Coordinator, SERC School on Modeling of Industrial Reactors, IIT Kanpur, July 12 – 17, 2004 (42 participants, including 9 from industry /R&D labs).

Consulting Editor, Allied Publishers' Textbook Series in ChE, 1993 – 1998.

Series Editor, IITK Series of Advanced Texts, Narosa, New Delhi, 1993 – 2000.

Head of Chemical Engineering Department, IIT Kanpur, 1987 – 1989.

Member, Chem. Engg. Research Advisory Committee, Indian Petrochemicals Corp. Ltd., Vadodara, 1984 – 1990.

Member, Program Advisory Committee for Thrust Area Funding in Chem. Eng., DST (Dept. of Sci. & Tech.), New Delhi, 1984.

Editor, IIT Kanpur Alumni Newsletter, 1975 – 1990.

Member and Convenor of *several* Institute and Departmental Committees, 1973 – 2012.

Member of *several* committees of the Indian Institute of Chemical Engineers, e.g., R & D Committee (90-91), Education and Examinations Committee (90-91), etc. Expert in several selection committees (NCL, IIT Delhi, HBTI, etc.).

Life Member of the Indian Institute of Chemical Engineers, Indian Society of Technical Education, Institution of Engineers (India).

and several more……

SEMINARS/INVITED LECTURES

TEQUIP Workshop in Chemical Engineering (Polymers), IIT Gauhati, "Multiobjective Optimization (MOO) of Polymerization Reactors (using MO-GA)", two lectures, 15-20 Dec 2014.

Energy Systems Modeling, Optimization and Control ESMOC-2013, NIT Durgapur: "Genetic Algorithm- (GA-) Based Multi-Objective Optimization (*Keynote Lecture*)", Dec 2013.

Foundation Day Lecture, IIT Kanpur: "Challenging Problems in Examinations", Nov 2013.

Evolution-2013 (Cognizance 2013), Technical Festival, IIT Roorkee Saharanpur Campus: "Polymerization Reaction Engineering: a Personal Journey (*Keynote Lecture*)", March 2013.

Advances in Chemical Engineering (Intl. Conference), ACE 2013, IIT Roorkee: "Multi-Objective Optimization: Bio-Mimetic Adaptations of Genetic Algorithm (*Keynote Lecture*)", Feb 2013.

Symposium on Recent and Emerging Advances in Chemical Engineering, REACH 2010, IIT Madras: "Population Balance-Based Model of Bubble Entrapment and Growth during Bulk Polymerization of Methyl Methacrylate (*Invited Lecture*)", Dec 2010.

University of Akron, Polymer Engineering Dept.: "Polymerization Reaction Engineering: A Personal Journey", June 2011.

University of Western Ontario, London-ON, Canada: "Multi-objective Optimization (MOO) using Biomimetic Adaptations of Genetic Algorithm (GA)", June 2011.

IIChE's Deepak Group's Padma Bhushan Prof. L K Doraiswamy CHEMCON Distinguished Speaker Award 2010: "Multi-objective Optimization: Bio-mimetic Adaptations of Genetic Algorithm", Dec 2010.

Symposium on Recent and Emerging Advances in Chemical Engineering, REACH 2010, IIT Madras: "Population Balance-Based Model of Bubble Entrapment and Growth during Bulk Polymerization of Methyl Methacrylate (*Invited Lecture*)", Dec 2010.

International Conference on Modeling, Optimization and Computing ICMOC-2010, NIT Durgapur: "Step Growth Polymerization: a Personal Journey (*Plenary Lecture*)", Oct 2010.

IIT Bombay: "Polymerization Reaction Engineering: a Personal Journey", June 2010.

Dept. of Mechanical Engineering, IIT Bombay: "Multi-objective Optimization using Bio-mimetic Adaptations of Genetic Algorithm", May 2010.

Professor B. D. Tilak Lecture, UDCT/ICT Mumbai: "Polymerization Reaction Engineering: a Personal Journey", April 2010.

L&T Lecture, AZeotropy 2010, IIT Bombay: "Genetic Algorithm (GA), Multi-objective Optimization (MOO) and Biomimetic Adaptations", March 2010.

Inaugural Sukrut Ozarkar Memorial Lecture, MIT, Pune: "Polymerization Reaction Engineering: a Personal Journey", Feb 2010.

LIT, Nagpur: "Genetic Algorithm (GA), Multi-objective Optimization (MOO) and Biomimetic Adaptations", Feb 2010.

SERC School on Machine Learning and AI Techniques for Petroleum and Petrochemical Industry, MIT, Pune: "Genetic Algorithm, Multi-objective Optimization and Applications", Dec 2009.

Advances in Chemical Engineering and Process Technology (ACEPT), National Chemical Laboratory, Pune: "Biomimetic Adaptation of NSGA-II-aJG using the Biogenetic Law of Embryology for Multi-objective Optimization (*Invited Lecture*)", June 2009.

Polymer Processing Society Meeting, PPS-25, Goa: "Incipient Stable Bubble Formation during Bulk Polymerization of Methyl Methacrylate under Near-Isothermal Conditions (*Invited Lecture*)", Mar 2009.

Advances in Chemical Engineering, AChemE, 2009, Thapar University, Patiala: "Multi-Objective Optimization: Bio-mimetic Adaptations of Genetic Algorithm (*Invited Lecture*)", Feb 2009.

Indo-US Workshop on 'Materials Design: Measurement, Modeling and Informatics,' BEC, Shibpur, Kolkata: "Multi-Objective GA and its Applications in Polymers (*Invited Lecture*)", Jan 2009.

International Conference on Neural Network and Genetic Algorithm in Materials Science and Engineering, NGMS-2008, BEC, Shibpur, Kolkata: "Bio-mimetic Adaptations of Multi-Objective Optimization (MOO) Using Genetic Algorithm and Simulated Annealing (*Plenary Lecture*)", Jan 2008.

Professor N. N. Godbole Memorial University Lecture, IT, BHU, Varanasi*:* "Multiobjective Optimization (MOO) in Chemical Engineering using Genetic Algorithm (GA) with the Jumping Gene (JG) Adaptations", Oct 2007.

Hikal's CHEMCON Distinguished Speaker Award Lecture, IIChE Annual Meeting, IIT, Delhi: "Multi-Objective Optimization of an Industrial LDPE Reactor", Dec 2005.
SERC School on Modeling and Optimization of Chemical Reactors, I I T, Bombay: "Polymerization Engineering and Genetic Algorithms (6 lectures)", May 2005.

CSIR Diamond Jubilee Lecture, National Metallurgical Laboratory, Jamshedpur: "Genetic Algorithm (GA) and its use in the Multi-objective Optimization of Industrial Processes", July 2003.

National University of Singapore, Singapore: "Multiobjective Optimization of Industrial FCC Units (FCCUs) using Elitist Non-dominated Sorting Genetic Algorithm (NSGA-II) with Jumping Genes" and "Enhancement of the Efficiency of Genetic Algorithms using Transposons (Jumping Genes)", July 2002.

Research Department, BOC Gases Technology, Murray Hill, NJ: "Multi-Objective Optimization of Steam Reformers", July 2000.

Research Department, S C Johnson Polymers, Sturtevant, WI: "Simulation and Multi-Objective Optimization of an Industrial Wiped-Film PET Reactor", May 2000.

West Virginia University, Morgantown, WV: "Rheological Software Sensors for On-Line Optimizing Control of Polymerization Reactors", April 2000.

Dept. of Polymer Engineering, University of Akron, Akron, OH: "Rheological Software Sensors for On-Line Optimizing Control of Polymerization Reactors", April 2000.

University of Notre Dame, Notre Dame, IN: "Rheological Software Sensors for On-Line Optimizing Control of Polymerization Reactors", April 2000.

3M Lecture, Rheology Research Center, University of Wisconsin, Madison, WI: "Rheological Software Sensors for On-Line Optimizing Control of Polymerization Reactors", Nov. 1999.

National University of Singapore, Singapore: "On-Line Optimizing Control of Polymerization Reactors", Oct. 1998.

Golden Jubilee Congress of the Indian Institute of Chem. Engrs., IIT, New Delhi: "Polymerization Engineering: Some Current Problems *(Plenary Lecture)*", Dec.1997.

National Symposium on Advances in Chemical Reaction Engineering, BHU, Varanasi: "Simulation and Optimization of Industrial Polymerization Reactors (*Plenary Lecture*)", March 1997.

International Conference on Advances in Chemical Engineering, IIT, Chennai: "On-Line Optimizing Control of Polymerization Reactors (*Plenary Lecture*)", Dec. 1996.

Sir Padampat Research Institute, Kota: "Simulation and Optimization of Polymerization Reactors: A Case Study of Nylon 6", April 1993.

Roorkee University: "Structure and Properties of Polymers" and "Polymerization Engineering", March 1991.

Research Centre, Cochin Refineries Ltd., Ambalamugal: Lecture Series on "Optimization and Numerical Methods", Sep. 1990.

Malviya Regional Engg. College, Jaipur: "Polymerization Engineering --- the Agony and the Ecstasy (*Silver Jubilee Year Lecture Series),*" April 1990.

IIT Bombay: "Nylon 6 Polymerization: Simulation, Parametric Sensitivity and Optimization," Nov. 1989.

Research Center, Gujarat State Fertilizer Co. Ltd., Baroda: "Simulation and Optimization of Nylon 6 Reactors", April 1989.

International Conference on Advances in Chemical Engineering, IIT Kanpur: "Step Growth Polymerization *(Plenary Lecture),*" Jan. 1989.

Indo-US Seminar on ChE Education: Curriculum for the Future, I.I.Sc. Bangalore: "An Elective on Polymer Science and Engineering", Jan. 1988.

IIT, Chicago, IL: "Intermolecular Reactions in Step Growth Polymerization", Nov. 1986.

Allied Corp., Morristown, NJ: "Simulation and Optimization of Condensation Polymerization Reactors", July 1986.

Purdue University, West Lafayette, IN: "Simulation of Step Growth Polymerization Reactors", Dec. 1985.

University of Wisconsin, Madison, WI: "Simulation and Optimization of Step Growth Polymerization Reactors", Nov. 1985.

Kodak Research Labs., Rochester, NY: "Simulation and Optimization of Step Growth Polymerization Reactors", July 1985.

University of Massachusetts, Amherst, MA: "Analysis and Design of Reactors for Step Growth Polymerizations", July 1985.

University of Notre Dame, Notre Dame, IN: "Simulation and Optimization of Step Growth Polymerization", Feb. 1985.

IIT Bombay: "Polymer Reaction Engineering -- State of Art", Aug. 1984.

Research Center, Gujarat State Fertilizer Co. Ltd., Baroda: "Nylon 6 Reactor Simulation", July 1984.

Research Center, Indian Petrochemicals Corp. Ltd., Baroda: "Simulation and Optimization of Step Growth Polymerization Reactors" and "Effects of Mass Transfer in Polycondensation Reactor Design", June 1983.

Indian Academy of Sciences, 48th National Meeting, Nainital: Seminar on Polymer Science and Engineering, "Simulation and Optimization of PET Reactors", Oct. 1982.

R&D Department, Engineers India Ltd., New Delhi: Lecture Series on "LDPE Reactor Simulation", July 1982.

National Chemical Laboratory, Poona: "Unequal Reactivity Polycondensations", Sep. 1981.

Papers presented at conferences which have been published subsequently are given in the List of Publications.

SPONSORED PROJECTS & INDUSTRIAL CONSULTANCY

Polymerization of Nylon-6 in Semi-Batch Reactors, DST, New Delhi, 2006-09, Rs. 23,92,380.

Development of a Soft Sensor for Polymerization Reactors: On-line Optimal Control and Gas Entrapment, MHRD (R & D Scheme), New Delhi, 2005-08, Rs. 19,00,000.

On-Line Optimizing Control of PMMA (Bulk Polymerization) Reactors, DST, New Delhi, 2001-05, Rs. 16,57,482.

Optimizing Control of Free Radical Polymerization Reactors, DST, New Delhi, 1996-00, Rs.14,45,705.

Gel Effect in Semibatch Free Radical Polymerization Reactors, CSIR, New Delhi, 1993-96, Rs.5,08,000.

Optimization of the Semibatch Nylon 6 Reactor, Gujarat State Fertilizer Co. Ltd., Research Center, Baroda, 1993-96, Rs.1,10,000 + travel.

Development of Vapor-Grown Carbon Fibers, Aeronautics Research and Development Board, New Delhi, 1992-96, Rs.6,60,000 (with Dr. D. Kunzru).

Upgradation of Polymer Materials Laboratory, Ministry of Human Resource Development, New Delhi, 1990-92, Rs.15,00,000 (with Drs. Anil Kumar and R.P. Chhabra).

Simulation of the Batch Nylon 6 Reactor, Gujarat State Fertilizer Co. Ltd., Research Center, Baroda, 1984-87, Rs.50,000 (with Dr. K. S. Gandhi).

Simulation of Tubular LDPE Reactor, Indian Petrochemicals Corp. Ltd., Research Center, Baroda, 1985-86, Rs.65,000 (with Dr. Anil Kumar).

Simulation of Interstage Condensors and Coolers for Hydrocarbon Mixtures, Bharat Pumps and Compressors, Allahabad, 1983-84, Rs.36,000 (with Dr. Anil Kumar).

Development of a Simulation Package for Compression of Mixtures of Hydrocarbons, Bharat Pumps and Compressors, Allahabad, 1982-83, Rs.40,000 (with Dr. Anil Kumar).

Tetrafluorethylene and Teflon, Electronics Commission, Delhi, 1979-83, Rs.3,00,000 (with Dr. Anil Kumar).

Trouble-shooting of $NaNO_3$ plant at Lucknow, UPFC, Kanpur, 1977 (with Dr. Anil Kumar).

PVA Film Production, PP Identification, ALIMBCO, Kanpur, 1977.

Simulation of PVC Floor-tile Manufacture, Congoleum, USA, 1971 (with Prof. W.C. Forsman).

BOOKS AUTHORED/CO-AUTHORED

TEXTBOOKS

1. Manojkiumar C. Ramteke, D. N. Saraf and S. K. Gupta, ***Optimization for Engineers***, in preparation (3+ chapters finalized; problems to be added).

2. A. K. Ray and S. K. Gupta, **Mathematical Methods in Chemical and Environmental Engineering**, Cengage Learning, Singapore, 2004, 689 pages.

3. S. K. Gupta, **Numerical Methods for Engineers**, New Age Intl. Publishers (earlier: Wiley Eastern, New Delhi), 1995, 407 pages. 3rd Edition, 2015 (New Academic Science Ltd., Tunbridge Wells, UK 2014).

4. S. K. Gupta and A. Kumar, **Reaction Engineering of Step Growth Polymerization**, Plenum, N.Y., 1987, 430 pages.

5. V. Gupta and S. K. Gupta, **Fluid Mechanics and Its Applications,** Wiley Eastern/New Age Intl.Pub., New Delhi, 1984, 532 pages; 3rd Ed., 2016 (New Academic Science Ltd., Tunbridge Wells, UK, 2012).

6. S. K. Gupta, **Momentum Transfer Operations,** Tata McGraw Hill, New Delhi, 1979, 347 pages.

7. A. Kumar and S. K. Gupta, **Fundamentals of Polymer Science and Engineering**, Tata McGraw Hill, New Delhi, 1978, 547 pages.

EDITED BOOKS

8. K. Deb, P. Chakroborty, N. G. R. Iyengar and S. K. Gupta, Eds., **Advances in Computational Optimization and its Applications**, Universities Press, Hyderabad, 2007.

9. K. Deb, S. K. Gupta, *et al.*, Eds., **Simulated Evolution and Learning**, Lecture Notes in Computer Science, 6457, Springer, Berlin, 2010.

SOLUTIONS MANUALS

10. T. Srinivas, R. Aravind and S. K. Gupta, **Teachers' Manual for 'Numerical Methods for Engineers',** New Age Intl. Publishers, New Delhi, 1995, 309 pages; Second Edition*, 2010.

11. S. Sanghi, V. Gupta and S. K. Gupta, **Teachers' Manual for 'Fluid Mechanics and its Applications',** Wiley Eastern, New Delhi, 1984, 136 pages; Second Edition,* 2010.

12. A. Saboo and S. K. Gupta, **Solutions Manual for 'Momentum Transfer Operations'**, IIT Kanpur, 93 pages.