

Name : Prof. Anjana Gupta  
Institution address : Department of Applied Mathematics,  
Delhi Technological University,  
Bawana Road, Rohini, Delhi 110085.  
Tel : +91 – 9810751432  
Email : *anjanagupta@dce.ac.in*

### Academic Qualifications

Degree	Year	College/University	Discipline
PhD	2009	Mathematics Deptt, Delhi University	Mathematical Programming
MPhil	1998	Mathematics Deptt, Delhi University	Mathematics
MSc	1995	Kirorimal College, Delhi University	Mathematics (Hons)
BSc	1993	Kirorimal College, Delhi University	Mathematics (Hons)

- **Completed Chartered Management Institute (CMI) Level 5 Certificate in Management and Leadership ( UKIERI India and AICTE collaboration)**

### Experience

From	To	Institute	Position
Oct 2016	till date	Deptt of Applied Maths, DTU Delhi	Professor
Oct 2012	Oct 2016	Deptt of Applied Maths, DTU Delhi	Associate Professor
August 2006	October 2012	Maharaja Agrasen Inst. Tech., GGSIPU	Assistant Professor
November 1999	July 2006	Amity School of Eng. Tech., GGSIPU	Sr Lecturer

### List of Research Papers

#### Published in Journals:-

1. Parul Chauhan and Anjana Gupta, "Matrix Games with Proportional Linguistic Payoffs", *Soft Computing (Springer)*, <https://doi.org/10.1007/s00500-021-06363-3>.
2. Radhika Kavra, Anjana Gupta, Sangita Kansal Interval graph based energy efficient routing scheme for a connected topology in wireless sensor networks", *wireless networks (Springer)*, <https://doi.org/10.1007/s11276-021-02782-0>.
3. Sanjay Kumar, Anjana Gupta, Gurjit Singh Walia, "Systematic study of topology control methods and routing techniques in wireless sensor networks" , *Applied Intelligence (Springer)*, <https://doi.org/10.1007/s10489-021-02789-2>.
4. Kaushalendra Kumar Singh, Rajesh Kumar, Anjana Gupta. Comparative energy, exergy and economic analysis of a cascade refrigeration system incorporated with flash tank

- (HTC) and a flash intercooler with indirect subcooler (LTC) using natural refrigerant couples, *Sustainable Energy Technologies and Assessments*, Vol. 39, pp. 100716, 2020. (Published) (Elsevier; SCIE indexed, Impact factor: 5.353, Quartile - Q1)
5. Anjali Singh, Anjana Gupta, Aparna Mehra, "Best Criteria Selection Based PROMETHEE II Method, *OPSEARCH (Springer)*, 58, 160-180 (2021).
  6. Kaushalendra Kumar Singh, Rajesh Kumar, Anjana Gupta, Multiobjective Optimization of Thermodynamic and Economic Performances of Natural Refrigerants for Cascade Refrigeration", *Arabian Journal for Science and Engineering* , Elsevier, <https://doi.org/10.1007/s13369-021-05924-w>
  7. Rajesh Asthana, Gurjit Singh Walia, Anjana Gupta, A novel biometric crypto system based on cryptographic key binding with user biometrics, *Multimedia Systems* (2021) <https://doi.org/10.1007/s00530-021-00768-8>
  8. Rajesh Asthana, Gurjit Singh Walia, Anjana Gupta, Random area-perimeter method for generation of unimodal and multimodal cancelable biometric templates, *Applied Intelligence* (2021), <https://doi.org/10.1007/s10489-021-02201-z>
  9. Kaushalendra Kumar Singh, Rajesh Kumar, Anjana Gupta, Comparative Exergetic, Economic and Exergoeconomic analysis of a hybrid cascade refrigeration system using ammonia-propane, propane-propylene and isobutane-propane refrigerant pairs, *International Journal of Exergy*,(2021) (accepted)
  10. Tanya Malhotra, Anjana Gupta, Group operations and isomorphic relation with the 2-tuple linguistic variables, *Soft Computing* volume 24, pages 1828718300 (2020), <https://doi.org/10.1007/s00500-020-05367-9>
  11. Tanya Malhotra, Anjana Gupta, A systematic review of developments in the 2-tuple linguistic model and its applications in decision analysis, *Soft Computing volume 24*, pages 1828718300 (2020), <https://doi.org/10.1007/s00500-020-05031-2>
  12. Tanya Malhotra, Anjana Gupta, A new 2-tuple linguistic approach for unbalanced linguistic term sets *IEEE Transaction of Fuzzy Systems*, (2020), 10.1109/TFUZZ.2020.2994987
  13. Anjali Singh and Anjana Gupta, Some observations on 2-tuple linguistic and interval 2-tuple linguistic operators, has been accepted in *International Journal of Mathematical, Engineering and Management Sciences*, (2020),
  14. Anjali Singh, Anjana Gupta , Best Criteria Selection based PROMETHEE II to aid decision making under 2-tuple linguistic framework: case study of most energy efficient region worldwide *International Journal of Management and Decision Making*, Inderscience Publishers, 19, 44-65, 2020

15. Gurjit Singh Walia , Shivam Rishi, Rajesh Asthana , Aarohi Kumar , Anjana Gupta, Secure multimodal biometric system based on diffused graphs and optimal score fusion, *IET Biometric*, Volume 8, Issue 4, p. 231–242, 2019, DOI: 10.1049/iet-bmt.2018.5018
16. Anjali Singh, Anjana Gupta, Aparna Mehra, Matrix Games with 2-tuple Linguistic Information *Annals of Operations Research*, Springer, DOI: 10.1007/s10479-018-2810-6, 2018 287–295
17. Anjali Singh, Anjana Gupta Consensus model for multi-criteria decision making in emergency management *International Game Theory Review* (World Scientific) Accepted <https://doi.org/10.1142/S0219198920400101>
18. A. Kumar, A. Gupta and A. Mehra A Bi level Programming Approach for a Price Setting based Aggregate Production Distribution Planning *International Game Theory Review* (World Scientific) Accepted <https://doi.org/10.1142/S0219198920400095>
19. Mamata Sahu and Anjana Gupta, "Improving the consistency of incomplete hesitant multiplicative preference relation", *OPSEARCH*, 56, 324-343.
20. Mamata Sahu and Anjana Gupta, New transitivity property of intuitionistic multiplicative preference relation and its application in missing value estimation, *Annals of Fuzzy Mathematics and Informatics*, (2018), .
21. Akhilesh Kumar, Anjana Gupta, Aparna Mehra, A Bilevel Programming Model for Operative Decisions on Special Trains: An Indian Railways Perspective, *Journal of Rail Transport Planning and Management*, Volume 8, Issue 3-4, 184-206, 2018.
22. Mamata Sahu, Anjana Gupta and Aparna Mehra, Acceptably consistent incomplete interval-valued intuitionistic multiplicative preference relations, *Soft Computing*, Volume 22, Issue 22, 7463-7477, 2018.
23. Anjana Gupta and Mamata Sahu, A Method to Complement Incomplete Hesitant Multiplicative Preference Relation, *International Journal of Research and Analytical Reviews*, Volume 5, Issue 2, 1421–1429, 2018.
24. Mamata Sahu and Anjana Gupta, Incomplete Hesitant Fuzzy Preference Relation, *Journal of Statistics & Management Systems*, Volume 21, Issue 8, 1459-1479, 2018.
25. Anjali Singh and Anjana Gupta, Matrix Games with Interval-valued 2-tuple Linguistic Information, *Games*, Volume 9, Issue 3, 1-19, 2018.
26. Anjali Singh, Anjana Gupta, Aparna Mehra, Matrix Games with 2-tuple Linguistic Information, *Annals of Operations Research* (Springer) DOI: 10.1007/s10479-018-2810-6, 2018.

27. Anjali Singh, Anjana Gupta , Optimization based Consensus Model for Multi-Criteria Group Decision Making under 2-Tuple Linguistic Framework, ***International Journal of Engineering, Technology, Science and Research***, Volume 4, Issue 11, 1233-1243, 2017.
28. Gurjit Singh Walia, Saim Raza, Anjana Gupta, Rajesh Asthana, Kuldeep Singh A Novel Approach of Multi-Stage Tracking for Precise Localization of Target in Video Sequences, ***Expert Systems with Applications (ESWA), Elsevier, 10.1016/j.eswa.2017.02.007***.
29. Mamata Sahu, Anjana Gupta, Aparna Mehra, Hierarchical clustering of interval-valued intuitionistic fuzzy relations and its application to elicit criteria weights in MCDM problems, ***Operational Research Society of India, OPSEARCH,(springer)***, Volume 54, 388-416, 2017.
30. Anjali Singh, Anjana Gupta, Aparna Mehra, Energy Planning Problems with Interval-valued 2-Tuple Linguistic Information, ***Operational Research An International Journal***, Volume 17, Issue 3, 821-848, 2017.
31. Bhavna Saighal, M. K. Bhat and Anjana Gupta, Analytical study: Workplace Environment in IT Companies and Ranking of Companies using AHP Topsis Method, ***IOSR Journal of Business and Management (IOSR-JBM) Volume 17, Issue 5.(2015), PP 11-22, e -ISSN: 2278-487X, p-ISSN: 2319-7668***.
32. A. Gupta, S.S. Appadoo and A. Mehra, A New Solution Strategy For MCGDM Problems Using Entropy/Cross Entropy In Interval-Valued Intuitionistic Fuzzy Environment, ***International Game Theory Review, World Scientific, Vol. 17, No. 1 (2015) 1540007 (22 pages) DOI: 10.1142/S0219198915400071***.
33. P. Arora, A. Gupta and G. Bhatia, Higher Order Strict Minimizers for Multiobjective Fractional Programming Problems, ***Maxican Journal of Operational Research***, 2(2), 42-59, 2013.
34. D. Bhatia, A. Gupta and P. Arora, Optimality via Generalized Approximate Convexity and Quasi-efficiency, ***Optimization Letters***, 7, 127-135, 2013.
35. V. Bagla, A. Gupta and A. Mehra, Improving Consistency of Comparison Matrices in Analytical Hierarchy Process, ***International Journal of Current Engineering and Technology***, 3(2), 316-321, 2013.
36. V. Bagla and A. Gupta, Site Selection Using Optimization Techniques, ***International Journal of Scientific and Engineering Research***, 4(4), 1687-1694, 2013.
37. B. Saighal , M. K. Bhat and A. Gupta, Analytical Study of Work Environment in IT Sector, ***International Journal of Business Economics and Management Research***, 3(10), 88-144, 2013.

38. B. Saighal , M. K. Bhat and A. Gupta, An Analysis Of Indoor Office Environment and its Impact On Employees' Productivity in IT Sector with a Special Reference to Delhi and NCR, *International Journal of Management and Behavioral Sciences*, 1, 379-388, 2012.
39. V. Bagla, A. Gupta and D. Kukreja, Educational Software Evaluation, *International Journal of Computer Applications*, 36(11), 1-7, 2011.
40. V. Bagla and A. Gupta, Analytical Hierarchy Process Based Assignment Model for Allotting Parking Slots to Different Localities, *Journal of Multi-criteria Decision Analysis*, 18, 173-185, 2011.
41. A. Gupta, A. Mehra and D. Bhatia, Characterizing Strict Efficiency for Convex Multi-objective Programming Problems, *Journal of Global Optimization*, 49, 265-280, 2011.
42. A. Gupta, A. Mehra and D. Bhatia, Higher Order Efficiency, Saddle Point Optimality and Duality for Vector Optimization Problems, *Numerical Functional Analysis and Optimization*, 28(3-4), 1-14, 2007.
43. A. Gupta, A. Mehra and D. Bhatia, Approximate Convexity in Vector Optimization, *Bulletin of The Australian Mathematical Society*, 74(2), 207-218, 2006.

**Published in Proceedings:-**

1. Parul Chauhan, Anjana Gupta, Matrix Games with Linguistic Distribution Assessment Payoffs” has been accepted for presentation during the CIS 2021 and publication in the proceedings to be published in SCOPUS Indexed Springer Book Series, Lecture Notes on Data Engineering and Communications Technologies (ACCEPTED)
2. Aakash and Anjana Gupta A Review on recent development in the Mayfly Algorithm, Proceeding of International Conference on Paradigm of Communication, Computing and Data Science (PCCDS 2021), Springer (SCOPUS).
3. Shreya and Anjana Gupta, Best Criteria Selection Based Electre II: A Comparative study, Proceeding of 6th International Conference on Advanced Production and Industrial Engineering (ICAPIE-2021),Springer (SCOPUS) .
4. Yogesh, Kanchan and Anjana Gupta, An Extended Multilevel Transportation Problem with Multiple Inputs and Outputs, Proceeding of 6th International Conference on Advanced Production and Industrial Engineering (ICAPIE-2021),Springer (SCOPUS).
5. Research paper entitled Simulating percentage of workers opting to work from home during the Covid-19 pandemic using n-player iterative Game Theory, Proceeding of 6th International Conference on Advanced Production and Industrial Engineering (ICAPIE-2021), Springer (SCOPUS) .

6. Research paper entitled Optimisation of Pipe Network using Graph theory, Proceeding of 2nd International Conference on Multidisciplinary innovation in Academic Research (ICMIAR-2021), Springer (SCOPUS).
7. A. Kumar, A. Gupta and A. Mehra, Contingent Demand Fulfilment Decision Problem from Supplier's Perspective, published in the IEEE Xplore Digital Library, pp. 2271-2277. DOI: 10.1109/ICEEOT.2016.7755098, ISBN 978-1-4673-9939-5.
8. A.Singh, A. Gupta, An AHP-PROMETHEE II Method for 2-tuple Linguistic Multicriteria Group Decision Making, published in IEEE Xplore Digital Library, pp. 1 - 6, DOI: 10.1109/ICRITO.2015.7359374, ISBN 978-1-4673-7231-2.
9. A. Gupta, N.Malhotra and M. Kohli, Classification based on Data Envelopment Analysis and supervised learning a case study on energy performance of residential buildings, published in IEEE Xplore Digital Library, DOI: 10.1109/ICPEICES.2016.7853706.
10. V. Bagla, A. Gupta, B. Sharma, Leader Culling Using AHP - PROMETHEE Methodology, Third International Conference on Computational Intelligence Applications, Nashik, and proceedings published in International Journal of Computer Applications, 5-12, 2012.
11. V. Bagla and A. Gupta, Agronomic Business Promotion, book chapter in Business Intelligence and Data Warehousing, Narosa, 132-143, 2012.
12. P. Arora, G. Bhatia and A. Gupta, Characterizations of the Solution Sets and Sufficient Optimality Criteria via Higher-Order Strong Convexity, a Book chapter no. 14, Topics in Nonconvex Optimization, Springer Optimization and Its Applications, 2011.
13. A. Gupta, A. Mehra and D. Bhatia, Nonconvex Vector Minimization with Set Inclusion Constraints, Book chapter no. 9, Statistical Science and Interdisciplinary Research, Edited by S.K. Neogy, A.K. Das, R.B. Bapat, World Scientific, 6, 137-154, 2009.
14. A. Gupta and D. Bhatia, Decision Support for Comparative Evaluation of Used Cars, Quality Reliability and Infocom Technology, Macmillan Advance Research Series, 2006.
15. S. Prakash and A. Gupta, Efficient Solutions for the Problem Selecting Sites For Polling Stations and Assigning Voter-Area to them with Two Objectives, Presented of National Conference on Management Science and Practice, March 31-April 1, 2006, Indian Institute of Management Ahmadabad in collaboration with ORSI- Ahmadabad Chapter, Proceeding of the Conference.

### **Research Papers presented in the National / International conferences**

Research paper entitled A Review on recent development in the Mayfly Algorithm, International Conference on Paradigm of Communication, Computing and Data Science (PCCDS 2021). Research paper entitled Best Criteria Selection Based Electre II: A Comparative study, 6th International Conference on Advanced Production and Industrial

Engineering (ICAPIE-2021). Research paper entitled An Extended Multilevel Transportation Problem with Multiple Inputs and Outputs, 6th International Conference on Advanced Production and Industrial Engineering (ICAPIE-2021). Research paper entitled Simulating percentage of workers opting to work from home during the Covid-19 pandemic using n-player iterative Game Theory, 6th International Conference on Advanced Production and Industrial Engineering (ICAPIE-2021). Research paper entitled Optimisation of Pipe Network using Graph theory, 2nd International Conference on Multidisciplinary innovation in Academic Research (ICMIAR-2021). Tanya Malhotra, Anjana Gupta, Anjali Singh, "Best-worst Case Approach with interval-valued 2-tuple Linguistic Information" presented at International Conference on Recent Advances in Pure and Applied Mathematics (ICRAPAM-2018), held Delhi Technological University, Delhi during 23-25 October, 2018. Anjali Singh, Anjana Gupta, "Optimization based Consensus Model for Multi-Criteria Group Decision Making under 2-Tuple Linguistic Framework", presented at 5th International conference on Science, Technology & Management (ICSTM-2017), held at The Institution of Engineers India, Hyderabad on December 3, 2017. Anjali Singh, Anjana Gupta, "Optimization based consensus model to solve multicriteria large group decision-making problems" presented at International Symposium on Operations Research and Game Theory: Modelling and Computation, held at ISI, Delhi during January 9-11, 2018. M. Sahu and A. Gupta "Incomplete Intuitionistic Multiplicative Preference Relation" presented at the Symposium on Mathematical programming and Game theory, held during January 9-11, 2017 at Indian Statistical Institute (ISI), Delhi. A. Kumar, A. Gupta and A. Mehra, "Railways Decision Making Problem on Special Trains in a Bilevel Programming Framework, presented at", "2017 Symposium on Mathematical Programming and Game Theory", organized by SQC and OR Unit, Indian Statistical Institute, Delhi Centre, on January 09 - 11, 2017. A. Kumar, A. Gupta and A. Mehra, "Bilevel Programming Framework for Smart City Network Utilization and Improvement in Traffic Congestion", presented at "International Conference of Analytics in Operational Research, 49th Annual Convention of the Operational Society of India", organized by Birla Institute of Management Technology, Greater Noida, on December 12 - 14, 2016. A. Kumar, A. Gupta and A. Mehra, Contingent Demand Fulfilment Decision Problem from Supplier's Perspective, presented at International Conference on Electrical Electronics and Optimization Techniques (ICEEOT), organized by IEEE Madras Section, DMI College of Engineering, Chennai, Tamil Nadu, India on March 03 - 05, 2016. A. Kumar, A. Gupta and A. Mehra, A Bilevel Programming Approach for a Price Negotiation based Aggregate Production Distribution Planning, presented at "International Conference on Optimization, Computing and Business Analysis for Sustainable Development": ICOCBASD-2015, organized by Central University of Rajasthan, Ajmer, on February 20 - 22, 2015. A. Kumar, A. Gupta and A. Mehra, Multiobjective Vendor's Decision Problem on Contingent Demand Satisfaction, presented at "Workshop on Applied Optimization Models and Computation": WAOMC15, organized by Indian Statistical Institute, SQC and OR Unit, Delhi Centre, on January 28 - 30, 2015. A. Kumar, A. Gupta and A.

Mehra, "Multiobjective Vendor's Decision Problem on Contingent Demand Satisfaction" in workshop on Applied Optimization Models and Computation held at Indian Statistical Institute, January 28-30, 2015. M. Sahu, A. Gupta and A. Mehra, "Interval valued intuitionistic fuzzy multiple criteria decision making problem" in workshop on Applied Optimization Models and Computation held at Indian Statistical Institute, January 28-30, 2015. A. Singh, A. Gupta and A. Mehra, "An AHP-PROMETHEE II Method for 2-tuple Linguistic Multicriteria Group Decision Making" in workshop on Applied Optimization Models and Computation held at Indian Statistical Institute, January 28-30, 2015. Vandana Bagla, Anjana Gupta, Aparna Mehra, "Improving Consistency of Comparison Matrices in Analytical Hierarchy Process in the International Conference on Optimization Modelling Application (OPTIMA-2012), held during November 29- December 01, 2012. Vandana Bagla, Anjana Gupta, Bhavna Sharma, "Leader Culling Using AHP - PROMETHEE Methodology" presented in Third International Conference on Computational Intelligence Applications 2011 (ICCIA -2012) 11-12 Feb 2012 , Sandip Institute of Technology and Research Centre, Nashik-4222013 . Vandana Bagla, Anjana Gupta, "Agronomic Business promotion" presented in Business Intelligence and Data Warehousing held on March 17, 2012, Organized by University School Of Management Studies, Guru Gobind Singh Indraprastha University, Delhi Anjana Gupta, Aparna Mehra, Jagjeet Singh and NitinGupta, Multi-Criteria Decision Aid in Load forecasting of a condominium presented in APORS 09, December 6-09,2009 Jaipur India. Anjana Gupta, Aparna Mehra and Davinder Bhatia, Characterizing strict efficiency for convex multiobjective programming problems presented in 9th International Symposium on Generalised Convexity / Monotonocity, July 21-25, 2008 Kaohsiung, Taiwan. Anjana Gupta, Aparna Mehra and Davinder Bhatia, "Saddle point characterization in nonconvex vector minimization with set inclusion constraints", Presented in The International Conference on Modeling, Computation and Optimization (ICMCO-08) held on January 9-10, 2008, Indian Statistical Institute, Delhi Centre. Anjana Gupta, Aparna Mehra and Davinder Bhatia, "Non-convex vector minimization with set inclusion constraints", Presented in 22 European Conference on Operational Research held on July 8-11, 2007,Prague, Czech, Europe. Full grant from AICTE. Anjana Gupta, Aparna Mehra and Davinder Bhatia, "Higher order efficiency and saddle point optimality for vector optimization problems", presented in. International Symposium on Mathematical Programming for Decision Making: Theory and Applications (ISMPDM07) held on January 10-11, 2007 Anjana Gupta, Aparna Mehra and Davinder Bhatia, "Nonconvex vector minimization with set inclusion constraints", Presented in National Symposium on Functional Analysis, Optimization and their applications held on January 19- 20,2007. Anjana Gupta, Davinder Bhatia, "Decision support for comparative evaluation of used cars", Presented in Third International conference on Quality, Reliability and Information Technology (ICQRIT) held on December 2-4, 2006 , INSA, Delhi and appearing shortly in the proceeding of the conference Anjana Gupta, Aparna Mehra and Davinder Bhatia , "Nonconvex vector minimization with set inclusion constraints", Presented in National Symposium on Recent Advances in Optimization



Theory and Applications (RAOTA-2006) held on October 27-28, 2006. Anjana Gupta, Davinder Bhatia, Kunal, Abhishek Gupta, Sharadh Manian, Vareshvar Mehta, “Decision support system for comparative evaluation of used cars, International Conference on Operational Research Application in Infrastructure Development in conjunction with 2005 Annual Convention of Operational Research Society of India(ICORAID-2005-ORSI),to be held in December 27-29,2005. Venue Indian Institute of Science, Bangalore-560012. Anjana gupta, Aparna Mehra, Davinder Bhatia, “Approximate convexity and mixed duality for vector optimization problem”, International Conference on Operational Research Application in Infrastructure Development in conjunction with 2005 Annual Convention of Operational Research Society of India(ICORAID-2005-ORSI), to be held in December 27-29,2005 IISc, Bangalore. Venue : Indian Institute of Science ,Bangalore-560012. Anjana gupta, Aparna Mehra, Davinder Bhatia, “Higher order efficiency and saddle point optimality for vector optimization problem”, Second International conference on Quality, Reliability and Information Technology held on18-20 December,2003, Venue, Indian National Science Academy, Bahadurshah Zafar Marg , New Delhi-110002 Amita Goel and Anjana Gupta, “Best faculty selection using analytic hierarchy process”, Presented in 3rd International Conference on Intelligent Systems and Networks ( IISN-2009) held on Feb 14-16,2009 Amita Goel and Anjana Gupta, “Evaluation of secondary school based on analytic hierarchy process”, Presented in 3rd National Conference on Computing For Nation Development (INDIACom-2009) held on Feb 26-27, 2009.

### Workshops Organised:-

30. International Conference on Recent Advances in Pure and Applied Mathematics (ICRAPAM-2018), held Delhi Technological University, Delhi during 23-25 October, 2018 as hospital-ity coordinator.
2. One day TEQIP II sponsored workshop on ”Curriculum Revision and Development - 2016” on April 22, 2016 as coordinator.
3. One week TEQIP II sponsored faculty Development Programme on ” Statistical Methods and a Brief on Latex” during July 18-22, 2016 as organizing member.
4. One week TEQIP II sponsored faculty Development Programme on ” Advances in Microelectronics and Plasma Diagnostics(AMPD-16)” during August 29-Sep 2, 2016 as organizing member.

### Workshops Attended/Conferences Participated:-

1. International Conference on Recent Advances in Pure and Applied Mathematics (ICRAPAM-2018), held Delhi Technological University, Delhi during 23-25 October, 2018.

2. International Symposium on Operations Research and Game Theory: Modelling and Computation, held at ISI, Delhi during January 9-11, 2018.
3. Symposium on Mathematical programming and Game theory to be held during January 9-11, 2017 at Indian Statistical Institute (ISI), Delhi.
4. International Conference on Recent Advances in Optimization Theory and Applications, at Delhi University during January 30-31, 2016.
5. One week TEQIP II sponsored faculty Development Programme on "Statistical Methods and a Brief on Latex" during July 18-22, 2016.
6. Summer Faculty Research Fellow Programme - 2015 at IIT Delhi Department of Applied Mathematics June1- July15, 2015
7. Faculty Development Programme On Automation In Manufacturing (AIM-2015) (Under TEQIP-II) 04-15 MAY, 2015 at Mechanical Department, Delhi Technological University.
8. Short Term Course under (TEQIP) on Optimization Method and Applications, held during December 16-19, 2015 at Department of Applied Mathematics, IIT Delhi.
9. Short Term Training Programme on Advanced Web Designing Technique Under TEQIP, held during July 14-25, 2014 at Department of Applied Mathematics, Delhi Technological University.
10. Faculty Development Programme Under TEQIP on Modelling and Simulation of Dynamical Systems and Optimization held during June 9-13, 2014 at Delhi Technological University.
11. Short Term Course(AICTE approved) on Virtual Instrumentation through ICT held during April 28-May 2, 2014 at Delhi Technological University.
12. Cimpa School on Generalized Nash Equilibrium held during Nov 25- Dec 2, 2013 held at Department of Mathematics Delhi University.
13. Short Term Course(AICTE approved) on Cloud Computing Through ICT held during July 29-August 2, 2013 at Delhi Technological University.
14. Two day workshop on Intellectual Property Rights meets Information Technology- Series" held during May 2-3, 2013 at Delhi Technological University.
15. One Day workshop on IPR and PATENTS, held on March 8, 2013, at Delhi School Of Management, Delhi Technological University, Delhi.
16. Short Term Training Programme on "SPSS&MatLab" held during February 4-15, 2013 at Department of Applied Mathematics, Delhi Technological University.

17. Training Programme on Optimization and Its Applications held during November 26 - December 01, 2012 , Department of Operational Research, University of Delhi Sponsored by Department of Science and Technology (DST), New Delhi.
18. QIP short term course on introductory Finance Mathematics held during May 24 -June 04, 2010 at IIT Delhi .
19. Research Workshop on Optimization Techniques held during Feb 8 - 14, 2010in Delhi University.
20. QIP Summer Faculty Program in IIT Delhi from May 2009- July 2009.
21. Research Workshop on Optimization Theory and Applications held on September 3-6, 2008, held in IIT Kanpur.
22. Workshop on Analytical Hierarchy Process (AHP) by Professor Tom Saaty (U.S.A.) on 8th July 25, 2007 organized at 22 European Conference on Operational Research held on July 8-11, 2007, Prague, Czech, Europe.
23. International Workshop on Mathematical Modeling Optimization And Their Applications, April 23- 27, 2007, at Bhartia Vidyapeeth University, Paschim Vihar, Delhi.

**Brief details of Co-curricular and extra-curricular activities:-**

1. Delivered a invited talk in training programme on 'Data Development Analysis and Its Applications at DRDO on 7 October 2018.
2. Delivered a invited talk in training programme on 'Soft-Computing and Its Applications' in CEP programme at DRDO during 03-07 October 2016.
3. Observer for CMAT and GPAT (2016) AICTE.
4. Outside Expert to finalize the Syllabus for B.Tech. Courses (Mathematics) in IGDTU, Kashmere Gate, Delhi.
5. In-charge for records for BTech Mathematics and Computing scheme.
6. Coordinator of B.Tech. Mathematics and Computing for curriculum and syllabus.
7. LAB Incharge Operations research and Numerical methods LABS
8. Organized 5 day online competition entitled Wall - Street Powered by Sapiient Global Markets from 24th - 28th February where the where the smartest of country's minds got down to investing, trading and using their keen insights in becoming the leading 'Wolves' of the virtual Wall Street. The colleges like IIM's, FMS, MDI, IIT's, Symbiosis, Delhi University and more were tapped during this virtual trading competition.

9. Invited Talk in National Conference on Recent Trends in Operations Research, NCRTOR-2013, held on April 11-12, 2013, at Amity School of Engineering and Technology, Bijwasan, New Delhi. Sponsored by DST and CSIR.
10. Member of Advisory Committee in National Conference on Recent Trends in Operations Research, NCRTOR-2013, to be held on 11th and 12th April, at Amity School of Engineering and Technology, Bijwasan, New Delhi. Sponsored by DST and CSIR.
11. Member of Organizing committee for Short Term Training Programme on Advanced Web Designing Technique Under TEQUIP, held during July 14-25, 2014, at Department of Applied Mathematics, Delhi Technological University.
12. DRC member in the Department of Applied Mathematics, DTU.
13. BRS member in the Department of Applied Mathematics, DTU.
14. Member/expert SRC of various students at different Departments at DTU.
15. Reviewed NPTEL lectures of Linear Programming by Dr Aparna Mehra, IIT Delhi.

**Books:-**

1. Discrete Mathematics, Anjana Gupta, Kataria Publication, 4th edition, 2012.

**PhD Thesis Supervision:-**

1. Completed : 04
2. Under process 08

**Detail as Ph.D. Supervision Follows:**

1. Akhilesh Kumar, Strategic Planning and Decision Making Problems in the Bilevel Programming Framework, Delhi Technological University, Delhi . Completed. 2021.
2. Mamata Sahu, Incomplete Preference Relations in MCDM, Delhi Technological University, Delhi. Completed 2018
3. Anjali Singh, Computation with Linguistic Variables, Delhi Technological University, Delhi . Completed.2018
4. Vandana Bagla, Applications of Vector Optimization Problems, Teerthanker Mahaveer University, Uttar Pradesh, 2013.

5. KAUSHALENDRA KUMAR SINGH, PERFORMANCE ANALYSIS AND MULTI OBJECTIVE OPTIMIZATION OF MULTI STAGE VAPOUR COMPRESSION REFRIGERATION SYSTEMS, Thesis Submitted
6. Rajesh Asthana, Pre- PhD Viva completed
7. Tanya Malhotra, Pre- PhD Requested
8. 05 more Ph.D.students are working under my supervision