# CV of Prof. U.C. Gupta

**Full Name and Address :**

Umesh Chandra Gupta
Professor (Higher Administrative Grade) & Ex. Head
Department of Mathematics
Indian Institute of Technology Kharagpur
Kharagpur - 721302, India.
Tel: + 91 9434739612 (cell), + 91 3222 283654 (work), + 91-3222-283655 (home),
Email: umesh@maths.iitkgp.ac.in, ucgiitkgp@gmail.com
Home Page: http://www.iitkgp.ac.in/department/MA/faculty/ma-umesh

**Date and Place of birth :** March 16, 1957, Ghazipur, UP, India.

**Language Capability :** English, Hindi.

**Academic Qualification :**

- Ph.D. from Institute of Technology (IIT), Delhi, India, 1982
  Area and Title : Queueing Theory, *Transient Behaviour of Markovian Queues.*
- Master (Statistics) in 1978 from Banaras Hindu University (BHU), Varanasi, India.
- Bachelor (Mathematics, Statistics and Economics) in 1976 from BHU, India.

**Professional Experience :**

Dec. 1982 - Oct. 1985 : Officer of Indian Statistical Service (ISS), Group A service of Govt. of India (Entry through Union Public Service Commission, New Delhi) Central Statistical Organization, Department of Statistics, Ministry of Planning, New Delhi. As a probationer during Dec. 1982 to Aug 1984, I completed training program on Official Statistics and other related areas of Statistics. After completion of training, I was posted (Sept.1984-Oct.1985) as a Deputy Assistant Director at Directorate of National Malaria Eradication Programme, Ministry of Health and Family Welfare, New Delhi.

**Academic Experience at Department of Mathematics, IIT Kharagpur :**

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| 1. | Professor (HAG) | Aug. 2014 | - | till date |
| 2. | Professor | June 2003 | - | Aug. 2014 |
| 3. | Associate Professor | Dec. 1996 | - | May 2003 |
| 4. | Assistant Professor | Oct. 1991 | - | Nov. 1996 |
| 5. | Lecturer | Nov. 1985 | - | Sept. 1991 |

**Post-Doctoral Experience :**

1. Aug. 1989 - July 1990 : Royal Military College of Canada, Kingston.
2. Dec. 1993 - Dec. 1994 : Royal Military College of Canada, Kingston.

**Teaching Experience :**

I have taught number of courses at IIT Kharagpur to engineering/science students at undergraduate level ( B.Tech.) and Postgraduate (Engineering and other specialized branches ) M.Tech. level. Besides, I have also taught advance level courses to students of M.Sc. (Mathematics), M.Sc. (Mathematics and Computing), and M.Sc. (Statistics and Informatics). In particular, I have taught following courses:

- B.Tech. Mathematics-I, Mathematics-II, Probability and Statistics, Probability and Stochastic Processes.
- M.Tech. Statistical Methods, Techniques of Analysis and Programming, Statistical Quality Control, Applied Stochastic Processes, Object Oriented Programming.
- M.Sc. Probability and Statistics, Statistical Inference, Computational Statistics, Stochastic Process, Queueing Theory, Software Lab.

**Research Experience and other academic activities :**

1. Research

   Over 35 years in the area of Stochastic modeling and analysis of discrete and continuous time queueing systems. I have worked on several topics of queueing theory and population models viz. transient solution of Markovian queues, computational aspects of bulk and non-bulk queues, discrete-time queues with bulk and non-bulk arrival/service, queueing systems with vacations, queuing models with correlated arrivals MAP/DMAP. For the last 10 years, I have been working on alternative methods of analyzing MAP/G/1 type of queues which is usually analyzed using the Matrix analytic method (MAM). I have also worked in the area of Finance and in particular on portfolio optimization.

2. Ph. D. Guidance

   I have supervised 12 Ph.D. students at IIT Kharagpur. Eleven in the area of queueing theory, and one in the area of portfolio optimization. Details are given below:

   i) T. S. S. Srinivas Rao, Modelling and Analysis of M/G/1 Type Queues (1996).
   ii) P. V. Lakshmi, Analysis of Some Bulk Arrival/Service Queues with Finite Buffer(2003).
   iii) K. Sikdar, Analysis of Finite/Infinite Buffer Bulk Service Queue with Poisson and Markovian Arrival Process and Server Vacations (2004).
   iv) S. K. Samanta, Analysis of Finite-Buffer Vacation and Non-Vacation Discrete-Time Queueing Systems (2006).
   v) A. D. Banik, Analysis of Vacation and Non-Vacation Queues Under Markovian Arrival/Service Process (2007).
   vi) A. Banerjee, Analysis of Finite-Buffer Bulk-Service Queues with and without Batch Size - Dependent Service (2012).
   vii) Gagandeep Singh Rahi, Computational Analysis of Single Server Queues with Markovian Arrival Processes Using Roots (2012).

viii) P Kumar, Interval Optimization Methods for Portfolio Selection Problem (2015). Jointly with Prof. G. Panda.

ix) S Pradhan, Analysis of Infinite Buffer Batch-Service Queues with State Dependent Service, (2016).

x) A. Maity, Continuous and Discrete-Time Modeling and Performance Analysis of Infinite-buffer Batch-Service Queues (2019).

xi) F. P. Barbhuiya, Analysis of Continuous and Discrete-Time Infinite Buffer Queues with Batch Renewal Arrival (2020).

xii) N. Kumar, Stochastic Modeling and Analysis of Population Models Subject to Mild Catastrophes (2021).

3. Undergraduate and Postgraduate - Project Thesis Guidance

   - B. Tech/ M.Sc. - Supervised over 100 students in the area of Stochastic Modelling, Queueing, Statistics, Machine Learning, Data Analytic, Computational Statistics, Financial engineering and other related areas.
   - M.Tech.(Computer Science and Data Processing) - Supervised over 25 students in the area of Application of queues in telecommunication, Machine Learning and data analytic.
   - M.Tech. (Financial Engineering) - 3

4. Sponsored Projects

   - Title of Project : Computational Analysis of Some Bulk and Non-bulk Queueing Models and Development of Software Packages. Funding Agency-CSIR, New Delhi, Amount - Rs. 1.5 Lakh, Duration - (1992-94).
   - Title of Project : Studies on the Analytic and Numerical Aspects of Queues. Funding Agency- SERB, DST, New Delhi, Amount - Rs. 13 Lakh, Duration - (2013-2016).

5. Publications

   Published about 108 research papers and many papers appeared in journals such as Stochastic Processes and Their Applications, Queueing Systems, European Journal of Operational Research, Performance Evaluation, Journal of Applied Probability, Probability Engineering and Informational Science, Operational Research Letters, Informs Journal of Computing, Operations Research Letters, Computers and Operations Research, Journal of Operational Research Society, OR Spektrum, RAIRO, TOP, Journal of Applied Mathematics and Stochastic Analysis, International Journal of Computer Mathematics, Methodology and Computing in Applied Probability, Annals of Operations Research, Communications in Statistics, (See detailed publication list).

6. Conferences

   Attended and presented papers in several national and international conferences such as TIMS/ORSA, Las Vegas, USA, April 1990, CORS Ottawa, May 1990, CORS Montreal, June 1994, TIMS/ORSA, Detroit, October 1994. CORS Ottawa, May 1997, Madrid conference on Queues, July 2002, International Conference of Operations Research, Aug. 30 - Sept. 2, 2011, Zurich, ICCM Auckland 2015, (See detailed list).

**Administrative Experience :**

1. Dec.1982 - Sept. 1984 Officer (Class-I) and Probationer of Indian Statistical Service (ISS), Central Statistical Organisation, Department of Statistics, Ministry of Planning, New Delhi. As a probationer I successfully completed two years training program in Official Statistics, Applied Statistics and General Administration.

2. Oct. 1984 - Oct 1985 Deputy Assistant Director, Assessment section, Directorate of National Malaria Eradication Programme, New Delhi. My main job was monitoring and evaluation of the program, and general administration of Assessment Section.

3. July 1991 - Dec. 1993: Assistant Warden, Patel Hall, IIT Kharagpur.

4. July 2001 - July 2003: Chairman, Departmental Time-Table Committee.

5. July 2003 - July 2005: Warden, Dr. Rajendra Prasad Hall, IIT Kharagpur.

6. July 2002 - June 2004: Chairman, Departmental Purchase Committee.

7. July 2004 - June 2006: Chairman, Dept. Undergraduate Program Evaluation Committee.

8. July 2006 - July 2011: Member of Research Program Evaluation Committee (RPEC).

9. July 2006 - Feb. 2009: Director's nominee of Preparatory Course and SC/ST coordinator.

10. July 2007 - July 2010: Warden, Dr. Radhakrishna Hall, IIT Kharagpur.

11. Oct. 2010 - Sept. 2013: Chairman, Rajbhasa Vibhag, IIT Kharagpur.

12. July 2010 - Mar. 2013: Coordinator, Financial Engineering Program.

13. Oct. 2013 - Sept. 2016: Head, Dept. of Mathematics, IIT Kharagpur.

**Special Achievements :**

1. I was a core committee member for developing 5 years dual degree program of B.Tech. (core branch) and M.Tech. in Financial Engineering of the Institute. This program is running successfully since 2009 and I was appointed as the first coordinator of this program for a period of three years. The program has been well accepted by the industry.

2. I was nominated by Department of Science Technology as a member (Physical Sciences) for evaluation of project proposals submitted under the category of Fast Track Schemes, n-PDF of DST/SERB (Sept. 2012 - June 2021).

3. Based on my research contributions in the area of queuing theory, I was chosen twice to evaluate the projects from FWO, Belgium.

4. Examined number of Ph.D thesis from various universities/IITs/NITs.

5. Reviewer of several research papers from National and International Journals.

6. My research contribution has appeared in the book "Vacation Queueing Models-Theory and Applications" by Tian and Zhang, published by Springer.

7. I was one of the Judges for All India INTEL Science fair held at Bangalore Dec. 2005.

8. Acted as Member of National Board of Accreditation (NBA) for accreditation of courses in the area of IT/CS/MCA of various Engineering Colleges.

9. Nominated member of Scientific Advisory Committee (SAC), Institute of Advance Studies in Science and Technology, Guwahati (2017).

10. Associate Editor of American Journal of Mathematics and Management Science and Queueing Models and Service Management (QMSM).

11. Received Excellent grade at the end of completion of the project funded by DST "Studies on the Analytic and Numerical Aspects of Queue" by DST/SERB, New Delhi

**Foreign Visits and Research Collaboration :**

I have visited Department of Mathematics and Computer Science, Royal Military College, Kingston, Canada, several times in connection with research collaboration.

1. Aug. 1989 - July 1990 Visiting Research Scholar.

2. Dec. 1993 - Dec. 1994 Visiting Research Associate.

3. June 20 - July 20, 1996 Visiting Researcher.

4. May 25 - July 4, 1997 Visiting Research Professor.

5. June 5 - July 22, 1998 Visiting Senior Researcher.

6. May 24 -July 18,1999 Visiting Scientist.

7. June 2 - July 21, 2000 Visiting Scientist.

8. June 1 - July 31, 2003 Visiting Scientist.

9. May 30 - July 16 , 2006 Visiting Scientist.

10. June 26 - July 18, 2007 Visiting Scientist.

**Visits to other Foreign Universities/ Institutes :**

1. June 21 - July 3, 2001 Department of Industrial Engineering, Korea Advance Institute of Science and Technology, South Korea.

2. Oct. 11 - 24, 2004 SMACS RESEARCH GROUP Department of Telecommunications and Information Processing, Ghent University, Sint-Pietersnieuwstraat 41, B-9000 Gent, Belgium.

**Citation Report :**

As per Google Scholar as on Dec. 22, 2021

Citations - 2149
h-index 26
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**Publications (In order of the most recent one) :**

1. N Kumar and UC Gupta. Analysis of $BMAP/MSP/1$ queue with MAP generated negative customers and disasters. *Communications in Statistics - Theory and Methods 1-27, 2021. https://doi.org/10.1080/03610926.2021.1990953.*

2. N Kumar, UC Gupta, and G Singh. Computational and Numerical Investigation of the Batch Markovian Arrival Process Subject to Renewal Generated Geometric Catastrophes. *International Journal of Applied and Computational Mathematics. 7, 1-34, 2021. https://doi.org/10.1007/s40819-021-01112-4.*

3. G Singh, A Kumari, and UC Gupta. Stationary system-length distribution of Markovian bulk service queue with modified bulk service rule and dynamic service rates. *International Journal of Computer Mathematics: Computer Systems Theory, 1-21, 2021. https://doi.org/10.1080/23799927.2021.2000503.*

4. N Kumar and UC Gupta. Analysis of a population model with batch markovian arrivals influenced by markov arrival geometric catastrophes. *Communications in Statistics-Theory and Methods*, 50(13):3137-3158, 2021.

5. UC Gupta, N Kumar, S Pradhan, FP Barbhuiya, and ML Chaudhry. Complete analysis of a discrete-time batch service queue with batch-size-dependent service time under correlated arrival process: $D-MAP/G_n^{(a,b)}/1$. *RAIRO-Operations Research*, 55(3):1231–1256, 2021.

6. S Pradhan and UC Gupta. Stationary distribution of an infinite-buffer batch-arrival and batch-service queue with random serving capacity and batch-size-dependent service. *International Journal of Operational Research*, 40(1):1–31, 2021.

7. N Kumar and UC Gupta. A renewal generated geometric catastrophe model with discrete-time markovian arrival process. *Methodology and Computing in Applied Probability*, 22(3):1293–1324, 2020.

8. S Pradhan, and UC Gupta. Stationary queue and server content distribution of a batch-size-dependent service queue with batch Markovian arrival process: $BMAP/G_n^{(a,b)}/1$. *Communications in Statistics-Theory and Methods*, pages 1–28, 2020.

9. FP Barbhuiya and UC Gupta. Analytical and computational aspects of the infinite buffer single server $N$ policy queue with batch renewal input. *Computers & Operations Research*, 118:104916, 2020.

10. N Kumar, FP Barbhuiya, and UC Gupta. Analysis of a geometric catastrophe model with discrete-time batch renewal arrival process. *RAIRO-Operations Research*, 54(5), 1249-1268, 2020.

11. N Kumar and UC Gupta. Analysis of batch bernoulli process subject to discrete-time renewal generated binomial catastrophes. *Annals of Operations Research*, 287(1):257–283, 2020.

12. GK Gupta, A Banerjee, and UC Gupta. On finite-buffer batch-size-dependent bulk service queue with queue-length dependent vacation. *Quality Technology & Quantitative Management*, 17(5):501–527, 2020.

13. FP Barbhuiya and UC Gupta. A discrete-time $GI^X/Geo/1$ queue with multiple working vacations under late and early arrival system. *Methodology and Computing in Applied Probability*, 22(2):599–624, 2020.

14. N Kumar, FP Barbhuiya, and UC Gupta. Unified killing mechanism in a single server queue with renewal input. *Opsearch*, 57(1):246–259, 2020.

15. A Maity, UC Gupta, and N Kumar. Performance analysis of a discrete-time queue with versatile batch transmission rule under batch size sensitive policy. *Queueing Models and Service Management*, 3(2):203-234, 2020.

16. FP Barbhuiya and UC Gupta. Discrete-time queue with batch renewal input and random serving capacity rule: $G^X/Geo^Y/1$. *Queueing Systems*, 91(3):347-365, 2019.

17. UC Gupta, FP Barbhuiya, and A Maity. A discrete-time $GI^X/Geo^Y/1$ queue with early arrival system. *Int. J. Appl. Comput. Math.*, 5, 139, 2019.

18. FP Barbhuiya, N Kumar, and UC Gupta. Batch renewal arrival process subject to geometric catastrophes. *Methodology and Computing in Applied Probability*, 21(1):69–83, 2019.

19. S Pradhan and UC Gupta. Analysis of an infinite-buffer batch-size-dependent service queue with markovian arrival process. *Annals of Operations Research*, 277(2):161–196, 2019.

20. FP Barbhuiya and UC Gupta. A difference equation approach for analysing a batch service queue with the batch renewal arrival process. *Journal of Difference Equations and Applications*, 25(2):233–242, 2019.

21. P Kumar, G Panda, and UC Gupta. Multiobjective efficient portfolio selection with bounded parameters. *Arabian Journal for Science and Engineering*, 43(6):3311–3325, 2018.

22. P Kumar, G Panda, and UC Gupta. Stochastic programming technique for portfolio optimization with minimax risk and bounded parameters. *Sadhana*, 43(9):1–16, 2018.

23. S Pradhan and UC Gupta. Modeling and analysis of an infinite-buffer batch-arrival queue with batch-size-dependent service: $M^X/G_n^{(a,b)}/1$. *Performance Evaluation*, 108:16–31, 2017.

24. SR Chakravarthy, A Maity, and UC Gupta. An $(S, s)$ inventory in a queueing system with batch service facility. *Annals of Operations Research*, 258(2):263–283, 2017.

25. G Singh, UC Gupta, M L Chaudhry. Detailed computational analysis of queueing-time distributions of the $BMAP/G/1$ queue using roots. *Journal of Applied Probability*, 53(4):1078–1097, 2016.

26. UC Gupta, G Singh, and ML Chaudhry. An alternative method for computing system-length distributions of $BMAP/R/1$ and $BMAP/D/1$ queues using roots. *Performance Evaluation*, 95:60–79, 2016.

27. P Kumar, G Panda, and UC Gupta. An interval linear programming approach for portfolio selection model. *International Journal of Operational Research*, 27(1-2):149–164, 2016.

28. S Pradhan, UC Gupta, and SK Samanta. Analyzing an infinite buffer batch arrival and batch service queue under batch-size-dependent service policy. *Journal of the Korean Statistical Society*, 45(1):137–148, 2016.

29. S Pradhan, UC Gupta, and SK Samanta. Queue-length distribution of a batch service queue with random capacity and batch size dependent service: $M/G_r^Y/1$. *Opsearch*, 53(2):329–343, 2016.

30. SK Samanta, ML Chaudhry, António Pacheco, and UC Gupta. Analytic and computational analysis of the discrete-time $GI/D-MSP/1$ queue using roots. *Computers & Operations Research*, 56:33–40, 2015.

31. A Maity and UC Gupta. A comparative numerical study of the spectral theory approach of Nishimura and the roots method based on the analysis of $BDMMAP/G/1$ queue. *International Journal of Stochastic Analysis*, 2015.

32. A Maity and UC Gupta. Analysis and optimal control of a queue with infinite buffer under batch-size dependent versatile bulk-service rule. *Opsearch*, 52(3):472–489, 2015.

33. A Banerjee, UC Gupta, and S R Chakravarthy. Analysis of a finite-buffer bulk-service queue under markovian arrival process with batch-size-dependent service. *Computers & Operations Research*, 60:138–149, 2015.

34. P Kumar, G Panda, and UC Gupta. Portfolio rebalancing model with transaction costs using interval optimization. *Opsearch*, 52(4):827–860, 2015.

35. UC Gupta and S Pradhan. Queue length and server content distribution in an infinite-buffer batch-service queue with batch-size-dependent service. *Advances in Operations Research*, 2015, 2015.

36. G Singh, UC Gupta, and ML Chaudhry. Analysis of queueing-time distributions for $MAP/D_n/1$ queue. *International Journal of Computer Mathematics*, 91(9):1911–1930, 2014.

37. UC Gupta, SK Samanta, and V Goswami. Analysis of a discrete-time queue with load dependent service under discrete-time markovian arrival process. *Journal of the Korean Statistical Society*, 43:545–557, 2014.

38. A Banerjee, UC Gupta, and V Goswami. Analysis of finite-buffer discrete-time batch-service queue with batch-size-dependent service. *Computers & Industrial Engineering*, 75:121–128, 2014.

39. SK Samanta, UC Gupta, and RK Sharma. Alternative approach for analyzing discrete-time finite-buffer queues with server vacations.

40. G Singh, UC Gupta, and ML Chaudhry. Computational analysis of bulk service queue with markovian arrival process: $M/R^{(a,b)}/1$ queue. *Opsearch*, 50(4):582–603, 2013.

41. A Banerjee, UC Gupta, and K Sikdar. Analysis of finite-buffer bulk-arrival bulk-service queue with variable service capacity and batch-size-dependent service. *International Journal of Mathematics in Operational Research*, 5(3):358–386, 2013.

42. ML Chaudhry, G Singh, and UC Gupta. A simple and complete computational analysis of $MAP/R/1$ queue using roots. *Methodology and Computing in Applied Probability*, 15(3):563–582, 2013.

43. G Singh, ML Chaudhry, and UC Gupta. Computing system-time and system-length distributions for $MAP/D/1$ queue using distributional little's law. *Performance Evaluation*, 69(2):102–118, 2012.

44. A Banerjee and UC Gupta. Reducing congestion in bulk-service finite-buffer queueing system using batch-size-dependent service. *Performance Evaluation*, 69(1):53–70, 2012.

45. A Banerjee, K Sikdar, and UC Gupta. Computing system length distribution of a finite-buffer bulk-arrival bulk-service queue with variable server capacity. *International Journal of Operational Research*, 12(3):294–317, 2011.

46. UC Gupta and A Banerjee. New results on bulk service queue with finite-buffer: $M/G^{(a,b)}1/N$. *Opsearch*, 48(3):279–296, 2011.

47. SK Samanta, UC Gupta, and ML Chaudhry. Analysis of stationary discrete-time $GI/D-MSP/1$ queue with finite and infinite buffers. *4OR*, 7(4):337–361, 2009.

48. AD Banik, UC Gupta, and ML Chaudhry. Finite-buffer bulk service queue under markovian service process: $GI/BMSP^{(a,b)}/1/N$. *Stochastic analysis and applications*, 27(3):500–522, 2009.

49. AD Banik, ML Chaudhry, and UC Gupta. On the finite buffer queue with renewal input and batch markovian service process: $GI/BMSP/1/N$. *Methodology and Computing in Applied Probability*, 10(4):559–575, 2008.

50. V Goswami, SK Samanta, P Vijaya Laxmi, and UC Gupta. Analyzing a multiserver bulk-service finite-buffer queue. *Applied Mathematical Modelling*, 32(9):1797–1812, 2008.

51. K Sikdar and UC Gupta. On the batch arrival batch service queue with finite buffer under server's vacation: $M^X/G^Y/1/N$ queue. *Computers & Mathematics with Applications*, 56(11):2861–2873, 2008.

52. K Sikdar, UC Gupta, and RK Sharma. The analysis of a finite-buffer general input queue with batch arrival and exponential multiple vacations. *International Journal of Operational Research*, 3(1-2):219–234, 2008.

53. AD Banik and UC Gupta. Analyzing the finite buffer batch arrival queue under Markovian service process: $GI^X/MSP/1/N$. *Top*, 15(1):146–160, 2007.

54. UC Gupta, SK Samanta, RK Sharma, and ML Chaudhry. Discrete-time single-server finite-buffer queues under discrete Markovian arrival process with vacations. *Performance Evaluation*, 64(1):1–19, 2007.

55. SK Samanta, UC Gupta, and RK Sharma. Analysis of finite capacity discrete-time $GI/Geo/1$ queueing system with multiple vacations. *Journal of the Operational Research Society*, 58(3):368–377, 2007.

56. SK Samanta, UC Gupta, and RK Sharma. Analyzing discrete-time $D-BMAP/G/1/N$ queue with single and multiple vacations. *European journal of Operational Research*, 182(1):321–339, 2007.

57. AD Banik, UC Gupta, and SS Pathak. On the $GI/M/1/N$ queue with multiple working vacations-analytic analysis and computation. *Applied Mathematical Modelling*, 31(9):1701–1710, 2007.

58. SK Samanta, ML Chaudhry, and UC Gupta. Discrete-time $Geo^X/G^{(a,b)}/1/N$ queues with single and multiple vacations. *Mathematical and Computer Modelling*, 45(1-2):93–108, 2007.

59. V Goswami, UC Gupta, and SK Samanta. Analyzing discrete-time bulk-service $Geo/Geo^b/m$ queue. *RAIRO-Operations Research-Recherche Opérationnelle*, 40(3):267–284, 2006.

60. UC Gupta, SK Samanta, and ML Chaudhry. A unified approach to analyzing the discrete-time finite-buffer queue with batch-Markovian arrival process under partial-and whole-batch acceptance strategies: D-BMAP/G/1/N. *Engineering Simulation-Electronic Modelling* , 28 (3) 1–23, 2006.

61. AD Banik, UC Gupta, and SS Pathak. Finite buffer vacation models under e-limited with limit variation service and markovian arrival process. *Operations Research letters*, 34(5):539–547, 2006.

62. AD Banik, UC Gupta, and SS Pathak. $BMAP/G/1/N$ queue with vacations and limited service discipline. *Applied Mathematics and Computation*, 180(2):707–721, 2006.

63. UC Gupta and Karabi Sikdar. Computing queue length distributions in $MAP/G/1/N$ queue under single and multiple vacation. *Applied mathematics and computation*, 174(2):1498–1525, 2006.

64. K Sikdar and UC Gupta. The queue length distributions in the finite buffer bulk-service $MAP/G/1$ queue with multiple vacations. *Top*, 13(1):75, 2005.

65. UC Gupta, AD Banik, and SS Pathak. Complete analysis of $MAP/G/1/N$ queue with single (multiple) vacation (s) under limited service discipline. *Journal of Applied Mathematics and Stochastic Analysis*, 2005(3):353–373, 2005.

66. K Sikdar and UC Gupta. Analytic and numerical aspects of batch service queues with single vacation. *Computers & operations research*, 32(4):943–966, 2005.

67. UC Gupta, SK Samanta, and RK Sharma. Computing queue length and waiting time distributions in finite-buffer discrete-time multiserver queues with late and early arrivals. *Computers & Mathematics with Applications*, 48(10-11):1557–1573, 2004.

68. UC Gupta and K Sikdar. A finite capacity bulk service queue with single vacation and Markovian arrival process. *Journal of Applied Mathematics and Stochastic Analysis*, 2004(4):337–357, 2004.

69. UC Gupta and K Sikdar. The finite-buffer $M/G/1/$ queue with general bulk-service rule and single vacation. *Performance evaluation*, 57(2):199–219, 2004.

70. ML Chaudhry, UC Gupta, and V Goswami. On discrete-time multiserver queues with finite buffer: $GI/Geom/m/N$. *Computers & Operations Research*, 31(13):2137–2150, 2004.

71. ML Chaudhry and UC Gupta. Queue length distributions at various epochs in discrete-time $D-MAP/G/1/N$ queue and their numerical evaluations. *International Journal of Information and Management Sciences*, 14(3):67–84, 2003.

72. ML Chaudhry and UC Gupta. Analysis of a finite-buffer bulk-service queue with discrete-Markovian arrival process: $D-MAP/G^{(a,b)}/1/N$. *Naval Research Logistics (NRL)*, 50(4):345–363, 2003.

73. V Goswami and UC Gupta. Distribution of the number of customers served during a busy period in a discrete time $Geom/Geom/1$ queue. *Indian Journal Of Pure & Applied Mathematics*, 33(9):1405–1408, 2002.

74. UC Gupta and V Goswami. Performance analysis of finite buffer discrete-time queue with bulk service. *Computers & Operations Research*, 29(10):1331–1341, 2002.

75. ML Chaudhry, UC Gupta, and V Goswami. Relations among the distributions at different epochs for discrete-time $GI/Geom/m$ and continuous-time $GI/M/m$ queues. *International Journal of Information and Management Sciences*, 12(3):71–82, 2001.

76. ML Chaudhry and UC Gupta. Computing waiting-time probabilities in the discrete-time queue: $GI^X/G/1$. *Performance Evaluation*, 43(2-3):123–131, 2001.

77. UC Gupta and P Vijaya Laxmi. Analysis of the $MAP/G^{(a,b)}/1/N$ queue. *Queueing Systems*, 38(2):109–124, 2001.

78. ML Chaudhry, UC Gupta, and V Goswami. Modeling and analysis of discrete-time multiserver queues with batch arrivals: $GI^X/Geom/m$. *INFORMS Journal on Computing*, 13(3):172–180, 2001.

79. UC Gupta and P Vijaya Laxmi. The relations among the queue size distributions at departure, arbitrary and pre-arrival epochs in the $MAP/G/1$ queue with finite/infinite bufferan alternative approach. *Opsearch*, 38(5):520–530, 2001.

80. ML Chaudhry and UC Gupta. Algorithmic discussions of distributions of numbers of busy channels for $GI/Geom/m/m$ queues. *INFOR: Information Systems and Operational Research*, 38(1):51–63, 2000.

81. UC Gupta and P Vijaya Laxmi. On the finite-buffer bulk-arrival $GI^X/E_k/1/N$ queueing system. *Opsearch*, 37(2):154–169, 2000.

82. TSS Srinivasa Rao and UC Gupta. Performance modelling of the $M/G/1$ machine repairman problem with cold-, warm-and hot-standbys. *Computers & industrial engineering*, 38(2):251–267, 2000.

83. P Vijaya Laxmi and UC Gupta. Analysis of finite-buffer multi-server queues with group arrivals:$GI^X/M/c/N$. *Queueing Systems*, 36(1):125–140, 2000.

84. J Maiti, A Bhattacherjee, UC Gupta, and SC Ray. An application of logit model to injury experience data. *Mineral Resources Engineering*, 8(02):239–252, 1999.

85. ML Chaudhry and UC Gupta. Modelling and analysis of $M/G^{(a,b)}/1/N$ queue-a simple alternative approach. *Queueing Systems*, 31(1):95–100, 1999.

86. P Vijaya Laxmi and UC Gupta. On the finite-buffer bulk-service queue with general independent arrivals: $GI/M^{[b]}/1/N$. *Operations Research Letters*, 25(5):241–245, 1999.

87. V Goswami and UC Gupta. Analyzing the discrete-time multiserver queue $Geom/Geom/m$ queue with late and early arrivals. *International Journal of Information and Management Sciences*, 9(2):55–66, 1998.

88. ML Chaudhry and UC Gupta. Performance analysis of discrete-time finite-buffer batch-arrival $GI^X/Geom/1/N$ queues. *Discrete Event Dynamic Systems*, 8(1):55–70, 1998.

89. UC Gupta and TSS Srinivasa Rao. On the analysis of single server finite queue with state dependent arrival and service processes: $M(n)/G(n)/1/K$. *Operations-Research-Spektrum*, 20(2):83–89, 1998.

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98. TSS Srinivasa Rao and UC Gupta. On the $GI/M(n)/1/K$ queue-an alternative approach. *Optimization*, 35(3):265–273, 1995.

99. TSS Srinivasa Rao and UC Gupta. A simple and efficient analysis of an $M/G/1/K/N$ queue. *Asia-Pacific Journal Of Operational Research*, 12(1):99–110, 1995.

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101. ML Chaudhry and UC Gupta. Exact computational analysis of waiting-time distributions of single-server bulk-arrival queues: $M^X/G/1$. *European Journal of Operational Research*, 63(3):445–462, 1992.

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104. Chaudhry ML and Madill BR. Computational aspects of bulk-service queueing system with variable capacity and finite waiting space: $M/G^Y/1/N+B$. *Journal of the Operations Research Society of Japan*, 34(4):404–421, 1991.

105. UC Gupta. Steady-state results for the transportation system with $k$-class of vehicles. *Optimization*, 19(3):421–426, 1988.

106. UC Gupta and OP Sharma. On the transient behaviour of a model for queues in series with finite capacity. *International Journal of Production Research*, 21(6):869–879, 1983.

107. OP Sharma and UC Gupta. $M/M/\infty$ queues in series with non-homogeneous inputs. *Mathematische Operationsforschung und Statistik. Series Optimization*, 14(3):445–453, 1983.

108. OP Sharma and UC Gupta. Transient behaviour of an $M/M/1/N$ queue. *Stochastic Processes and their Applications*, 13(3):327–331, 1982.

**Publications under Review :**

1. N Kumar and UC Gupta. A generalized random walk on non-negative integers.

2. FP Barbhuiya, N Kumar, and UC Gupta. Analysis of the $GI/M/c$ queue with N-threshold policy.

3. N Kumar and UC Gupta. Markovian arrival process subject to renewal generated binomial catastrophes.

**Contribution to Book Chapter :**

1. UC Gupta, N Kumar, and FP Barbhuiya. A queueing system with batch renewal input and negative arrivals. In *Applied Probability and Stochastic Processes, Infosys Science Foundation Series,Joshua V., Varadhan S., Vishnevsky V. (eds)*, pages 143-157. Springer, Singapore, 2020.

2. UC Gupta. Bulk Service Queue - An Introduction and overview of current research trends. In *Stochastic Modeling in Physical and Biological Sciences, V. Thangaraj and G. Choudhury (eds)*, 175-199. Narosa, India, 2015.

3. ML Chaudhry and UC Gupta. Numerical evaluation of state probabilities at different epochs in multiserver $GI/Geo/m$ queue. In *Advances on Methodological and Applied Aspects of Probability and Statistics (Ed. by N. Balakrishnan) Gordon and Breach Science Publishers*, 31-46, 2001.

4. ML Chaudhry and UC Gupta. Transient behaviour of the discrete-time $Geom/Geom/m/m$ erlang loss model. *Probability Models and Statistics, AJ Medhi Festschrift, Edited by A.C. Borthakur, New Age Publishers, India* , 133–145, 1996.

**Participation in Conferences and Invited Talks :**

1. Computational analysis of waiting time distributions in $M^X/G/1$ queues. TIMS/ORSA Joint National Meeting, May 7-9, 1990, LasVegas, U.S.A.

2. Computational analysis of some queueing models: M/G/1, M/G/1/N+1 and $M^X/G/1$. Invited talk at Department of Mathematics and Statistics, April 17, 1990 McMaster University, Hamilton, Canada

3. Computational analysis of number in system and waiting time distributions in M/G/1 queues. Annual Conference of the Operational Research of Canada, May 22-24, 1990, Ottawa, Canada.

4. Attended Annual Conference of the Operational Research of Canada, June, 1994, Montreal, Canada.

5. Performance analysis of discrete-time Geom(n)/G(n)/1/N queue. TIMS/ORSA Joint National Meeting, October 28-31, 1994, Detroit, U.S.A.

6. On the discrete time queues GI/Geom/1 and GI/Geom/1/N. Invited talk at Department of Statistics, September 13, 1994 University of Winnipeg, Winnipeg, Canada

7. On the modelling and analysis of discrete-time GI/Geom/1 queues. Invited talk in International Conference on Stochastic Processes, Dec. 26-29, 1996 Cochin, India.

8. Performance analysis of the discrete-time GI/Geom/1/N queue. XXVIII Annual Convention of the Operational Research Society of India, Dec. 27- 29, 1995, New Delhi, India.

9. Erlang loss formulae and distributions of numbers of busy channels for the GI/Geom/m/m queues Annual Conference of the Operational Research of Canada, May 25-27, 1997, Ottawa, Canada.

10. A unified approach to analyze the $GI^X/M/1/N$ and $GI/Ek/1/N$ queues. International Conference on Stochastic Processes and Their Applications, Jan. 8-10, 1998, Chennai, India.

11. Analysis of finite buffer multi-server queues with group arrivals: $GI^X/M/c/N$. First Joint Statistical Meeting of International Indian Statistical Association and other Indian Statistical Organizations, Dec. 30, 2000- Jan. 2, 2001, New Delhi, India.

12. Performance analysis of finite-buffer discrete-time queue with bulk service, National Conference on Communication (NCC-99), Jan. 29-31, 1999, Indian Institute of Technology, Kharagpur, India

13. Attended International Conference on Stochastic Modelling, IV International workshop on Retrial Queues held at Cochin, India , Dec. 17-21, 2002 and delivered a talk on " Analytic and Numerical Aspects of M/G(a,b) /1 Queue with Single vacation.

14. Delivered a lecture on recent advances on Bulk Service Queue with Finite-Buffer, Stochastic Modelling Group, Department of Industrial Engineering, Korea Advance Institute of Science and Technology, South Korea, July 2001.

15. Delivered a lecture on "Discrete-time queue with finite-buffer and server vacation under discrete Markovian arrival process" SMACS RESEARCH GROUP, Department of Telecommunications and Information Processing, Ghent University, Belgium, Oct. 2004

16. Attended "First Madrid conference on queueing Theory" and presented a paper "On the finite-buffer bulk service queue with single vacation", July 2-5, 2002, Spain.

17. Attended Joint 9th National Conference of the Vijanana Parishad of India on Applied and Industrial Mathematics and 5th Annual conference of Indian society of Information Theory and applications, held at NIST, New Delhi, Feb. 22-24, 2002 and presented paper "Modeling and analysis of discrete time multiserver queue with finite buffer".

18. Chaired the Session in "Conference on Distributed Processing and Networking" June 11-13, Held at IIT Kharagpur.

19. Invited talk "Analyzing finite buffer queue with server's vacation under Markovian Arrival Process (MAP)", Third national conference on mathematical and computational model, Dec. 13-18, 2005, Coimbatore.

20. Attended Joint Statistical Meeting and International Conference on Statistics, Probability and Related Areas, Jan. 2-5, 2007, Cochin and Presented a paper "Analyzing Discrete-Time queue with Single and Multiple Vacations, Also Chaired the session "Queues-2.

21. AD Banik, UC Gupta, and ML Chaudhry. Finite-buffer bulk service queue under markovian service process. In *Proceedings of the 2nd international conference on Performance evaluation methodologies and tools*, pages 1–6, 2007.

22. Delivered a lecture on "Discrete-Markovian arrival Process (D-MAP) and its application in discrete time queues" at Department of Mathematics and Computer Science, Royal Military College, Kingston, Canada, July 2000.

23. Complete analysis of bulk service queue with finite buffer: M/G(a,b)/1/N, Jointly with Anuradaha Banerjee. International Conference on Statistics, Probability, Operations Research, Computer Science and Allied Areas in Conjugation with VIII International Indian Statistical Association Joint Statistical Meeting and XXIX Annual Convention of ISPS, Jan. 4-8, 2010, Andhra University, Visakhapatnam, India

24. Performance analysis of a finite-buffer batch-service queue with batch-size-dependent service policy under Markovian Arrival Process, International Conference of Operations Research, Aug. 30 - Sept. 2, 2011, Zurich.

25. Invited Talk on "Performance analysis of batch-service queue with batch-size dependent service" Recent developments, International Conference on Mathematical Modelling & Applied Soft Computing, CIT, Coimbatore, 11-13, July 2012.

26. Invited Talk on Analysis of MAP/R/1 type Queues Using Roots - A Computational Endeavour, Eighth International Conference on Matrix-Analytic Methods in Stochastic Models (MAM8), NIT Calicut, India during 8-10 Jan., 2014

27. Modeling and Analysis of Bulk Service Queues with (s,S)-type Inventory, with S. R. Chakravarthy and A. Maity, Eighth International Conference on Matrix-Analytic Methods in Stochastic Models (MAM8), NIT Calicut, India during 8-10, Jan., 2014. Extended Abstract in Conference Proceedings, 13-14.

28. S Pradhan and UC Gupta. A unified approach for modeling and analysis of a versatile batch-service queue with correlated arrival. In *2015 Winter Simulation Conference (WSC)*, pages 3232–3233. IEEE, 2015.

29. A computational approach for determination of system length distribution of a batch arrival and batch service queue, The 6th International Conference on Computational Methods (ICCM2015), ICCM2015, July 14-17, Auckland, New Zealand.