

Curriculum vitae

Dr. Pankaj Kumar Tiwari

Assistant Professor

Department of Basic Sciences and
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Educational qualifications

- **Ph. D.**
University : Banaras Hindu University, Varanasi, Uttar Pradesh, India in 2015
Title of Thesis : Mathematical modeling and analysis of the control of water pollution and algal bloom in water bodies
Thesis supervisor : Prof. Arvind Kumar Misra,
Department of Mathematics, Institute of Science,
Banaras Hindu University, Varanasi-221005, India
- **M. Sc. (Mathematics)**
Passed from Banaras Hindu University, Varanasi, U.P., India in 2010 with CGPA 8.97/10
- **B. Sc. (Math-Hons)**
Passed from Magadh University, Bodh Gaya, Bihar in 2008 with 73.5 %
- **Intermediate**
Passed from B.I.E.C., Patna in 2004 with 62.7 %
- **High school**
Passed from B.S.E.B., Patna in 2002 with 59.1 %

Research experience

- **Post-doctoral Fellow:** Agricultural and Ecological Research Unit, Indian Statistical Institute, Kolkata from July 01, 2015 to April 30, 2016
- **Post-doctoral Fellow:** Department of Mathematics, University of Turin, Italy from May 02, 2016 to July 28, 2016

- **Post-doctoral Fellow:** Agricultural and Ecological Research Unit, Indian Statistical Institute, Kolkata from August 01, 2016 to April 05, 2018
- **Post-doctoral Fellow:** Department of Mathematics, University of Kalyani, Kalyani from April 06, 2018 to January 05, 2021

Awards

- Received D.S. Kothari Post-doctoral Fellowship, 2018
- Received travel grant to attend “**Ninth Workshop Dynamical Systems Applied to Biology and Natural Sciences**” held at Dipartimento di Matematica, Università di Torino, Italy, 2018
- Project fellow of World Wide Style Second Edition, University of Turin, Italy, 2016
- Received NBHM Post Doctoral Fellowship, 2015
- Received fellowship under the CSIR-UGC Fellowship Scheme, 2010
- Qualified GATE, 2011
- Won third prize under the best paper award category in the “**International Conference on India Biodiversity Meet-2013**”
- Won the best paper award in “**Mathematical Analysis and Applications, ACMS-BHU, 2015**”

Computer skills

- Computational Software : MatLab, Maple, Mathematica
- Typesetting Software : Latex, Microsoft Office

Research interests

- Mathematical Modeling in Ecology/ Biology
- Disease dynamics, Epidemiology and Ecoepidemiology
- Marine plankton dynamics and biodiversity
- Spatial dynamics

Published papers

1. J.B. Shukla, A. Goyal, **P.K. Tiwari**, A.K. Misra, Modeling the role of dissolved oxygen-dependent bacteria on biodegradation of organic pollutants, *International Journal of Biomathematics*, 7(1), 1450008(1-16), 2014.
2. A.K. Misra, **P.K. Tiwari**, A. Goyal, J.B. Shukla, Modeling and analysis of the depletion of organic pollutants by bacteria with explicit dependence on dissolved oxygen, *Natural Resource Modeling*, 27(2), 258-273, 2014.
3. **P.K. Tiwari**, S. Rana, A.K. Misra, J. Chattopadhyay, Effect of cross-diffusion on the patterns of algal bloom in a lake: a nonlinear analysis, *Nonlinear Studies*, 21(3), 443-462, 2014.
4. A.K. Misra, **P.K. Tiwari**, A model for the effect of density of human population on the depletion of dissolved oxygen in a water body, *Environment, Development and Sustainability*, 17, 623-640, 2015.

5. S. Chakraborty, **P.K. Tiwari**, A.K. Misra, J. Chattopadhyay, Spatial dynamics of a nutrient-phytoplankton system with toxic effect on phytoplankton, *Mathematical Biosciences*, 264, 94-100, 2015.
6. A.K. Misra, **P.K. Tiwari**, E. Venturino, Modeling the impact of awareness on the mitigation of algal bloom in a lake, *Journal of Biological Physics*, 42(1), 147-165, 2016.
7. E. Venturino, **P.K. Tiwari**, A.K. Misra, Modeling the depletion of dissolved oxygen in a water body located near a city, *Mathematical Methods in the Applied Sciences*, 40, 1081-1094, 2017.
8. S. Chakraborty, **P.K. Tiwari**, S.K. Sasmal, S. Biswas, S. Bhattacharya, J. Chattopadhyay, Interactive effects of prey refuge and additional food for predator in a diffusive prey-predator system, *Applied Mathematical Modelling*, 47, 128-140, 2017.
9. **P.K. Tiwari**, A.K. Misra, E. Venturino, The role of algae in agriculture: A mathematical study, *Journal of Biological Physics*, 43(2), 297-314, 2017.
10. S. Chakraborty, **P.K. Tiwari**, S.K. Sasmal, A.K. Misra, J. Chattopadhyay, Effects of fertilizers used in agricultural fields on algal bloom, *The European Physics Journal Special Topics*, 226(9), 2119-2133, 2017.
11. **P.K. Tiwari**, S.K. Sasmal, A. Sha, E. Venturino, J. Chattopadhyay, Effect of diseases on symbiotic systems, *BioSystems*, 159, 36-50, 2017.
12. A.K. Misra, **P.K. Tiwari**, P. Chandra, Modeling the control of algal bloom in a lake by applying some external efforts with time delay, *Differential Equations and Dynamical Systems*, DOI: 10.1007/s12591-017-0383-5.
13. **P.K. Tiwari**, I.M. Bulai, A.K. Misra, Ezio Venturino, Modeling the direct and indirect effects of pollutants on the survival of fish in water bodies, *Journal of Biological Systems*, 25(3), 521-543, 2017.
14. K. Ghosh, S. Biswas, S. Samanta, **P.K. Tiwari**, A.S. Alshomrani, J. Chattopadhyay, Effect of multiple delays in an eco-epidemiological model with strong Allee effect, *International Journal of Bifurcation and Chaos*, 27(11), 1750167(1-39), 2017.
15. I. Ghosh, **P.K. Tiwari**, S. Mandal, M. Martcheva, J. Chattopadhyay, A mathematical study to control Guinea Worm Disease: A case study on Chad, *Journal of Biological Dynamics*, 12(1), 846-871, 2018.
16. I. Ghosh, **P.K. Tiwari**, S. Samanta, I.M. Elmojtaba, N. Al-Salti, J. Chattopadhyay, A simple SI-type model for HIV/AIDS with media and self-imposed psychological fear, *Mathematical Biosciences*, 306, 160-169, 2018.
17. **P.K. Tiwari**, I.M. Bulai, F. Bona, E. Venturino, A.K. Misra, Human population effects on the Ulsoor lake fish survival, *Journal of Biological Systems*, 26(04), 603-632, 2018.
18. I. Ghosh, **P.K. Tiwari**, J. Chattopadhyay, Effect of active case finding on dengue control: Implications from a mathematical model, *Journal of Theoretical Biology*, 464, 50-62, 2019.
19. **P.K. Tiwari**, S. Samanta, J.D. Ferreira, A.K. Misra, A mathematical model for the effects of nitrogen and phosphorus on algal blooms, *International Journal of Bifurcation and Chaos*, 29(10), 1950129(1-30), 2019.
20. **P.K. Tiwari**, S. Samanta, F. Bona, E. Venturino, A.K. Misra, The time delays influence on the dynamical complexity of algal blooms in the presence of bacteria, *Ecological Complexity*, 39, 100769(1-18), 2019.

21. B. Maji, **P.K. Tiwari**, S. Samanta, S. Pal, F. Bona, Effect of time delay in a cannibalistic stage-structured predator-prey model with harvesting of an adult predator: The case of lionfish, *Journal of Biological Systems*, 27(04), 447-486, 2019.
22. S. Samanta, **P.K. Tiwari**, A.K. Alzahrani, A.S. Alshomrani, Chaos in a nonautonomous eco-epidemiological model with delay, *Applied Mathematical Modelling*, 79, 865-880, 2020.
23. S. Biswas, **P.K. Tiwari**, Y. Kang, S. Pal, Effects of zooplankton selectivity on phytoplankton in an ecosystem by free-viruses and environmental toxins, *Mathematical Biosciences and Engineering*, 17(2), 1272-1317, 2020.
24. S. Biswas, **P.K. Tiwari**, F. Bona, S. Pal, E. Venturino, Modeling the avoidance behavior of zooplankton on phytoplankton infected by free viruses, *Journal of Biological Physics*, 46(1), 1-31, 2020.
25. A. Mandal, **P.K. Tiwari**, S. Samanta, E. Venturino, S. Pal, A nonautonomous model for the effect of environmental toxins on plankton dynamics, *Nonlinear Dynamics*, 99(4), 3373-3405, 2020.
26. A.K. Misra, R.K. Singh, **P.K. Tiwari**, S. Khajanchi, Y. Kang, Dynamics of algae blooming: effects of budget allocation and time delay, *Nonlinear Dynamics*, 100, 1779-1807, 2020.
27. **P.K. Tiwari**, R.K. Singh, S. Khajanchi, Y. Kang, A.K. Misra, A mathematical model to restore water quality in urban lakes using Phoslock, *Discrete and Continuous Dynamical Systems Series B*, 2020, DOI: 10.3934/dcdsb.2020223.
28. A.K. Srivastav, **P.K. Tiwari**, M. Ghosh, Modelling the impact of early case detection on dengue transmission: deterministic vs. stochastic, *Stochastics Analysis and Applications*, 2020, DOI: 10.1080/07362994.2020.1804403.
29. R.K. Rai, **P.K. Tiwari**, Y. Kang, A.K. Misra, Modelling the effect of literacy and social media advertisements on the dynamics of infectious diseases, *Mathematical Biosciences and Engineering*, 17(5), 5812-5848, 2020.
30. A. Sarkar, **P.K. Tiwari**, F. Bona, S. Pal, Chaos in a nonautonomous model for the interactions of prey and predator with effect of water level fluctuation, *Journal of Biological Systems*, DOI: 10.1142/S0218339020500205.
31. A. Mandal, **P.K. Tiwari**, S. Pal, Impact of awareness on environmental toxins affecting plankton dynamics: a mathematical implication, *Journal of Applied Mathematics and Computing*, DOI: 10.1007/s12190-020-01441-5.
32. N.K. Thakur, A. Ojha, **P.K. Tiwari**, R. Upadhyay, An investigation of delay induced stability transition in nutrient-plankton systems, *Chaos, Solitons and Fractals*, 110474, 2020.
33. A.K. Srivastav, **P.K. Tiwari**, P.K. Srivastava, M. Ghosh, Y. Kang, A mathematical model for the impacts of face mask, hospitalization and quarantine on the dynamics of COVID-19 in India, *Mathematical Biosciences and Engineering*, 18(1), 182-213, 2021.
34. **P.K. Tiwari**, R.K. Rai, A.K. Misra, J. Chattopadhyay, Dynamics of infectious diseases: Local vs. global awareness, *International Journal of Bifurcation and Chaos*, Accepted.
35. **P.K. Tiwari**, K.A.N. Al Amri, S. Samanta, Q.J.A. Khan, J. Chattopadhyay, A systematic study of autonomous and nonautonomous predator-prey models with combined effects of fear, migration and switching, *Nonlinear Dynamics*, Accepted.

Members in professional bodies

1. Life member of Indian Mathematical Society, India (2013-)
2. Life member of Biomathematical Society of India, Kolkata, India (2013-)

3. Life member of Indian Academy of Mathematical Modeling and Simulation, IIT Kanpur, India (2016-)

Workshops/Seminars/Conferences participated/paper presented

1. Participated in the “**Advanced Training Programme in Functional Analysis-2009**” held at DST-Centre for Interdisciplinary Mathematical Sciences, Banaras Hindu University, Varanasi during 21 June-3 July, 2010.

2. Presented a paper entitled “**Modeling the survival of fish population in eutrophied water bodies**” in “**13th International Conference of the International Academy of Physical Sciences**” held at UPES, Dehradun during 14-16 June, 2011.

3. Presented a paper entitled “**Modeling the depletion of dissolved oxygen due to aerobic bacteria in water bodies**” in “**National Conference of Mathematical Modelling and Computer Simulation**” held at Bhabha Group of Institutions, Kanpur (rural) during 7-9 July, 2011.

4. Participated in a “**National Workshop on Linear and Nonlinear Systems**” held at Banasthali Vidyapith, Banasthali during 15-19 December, 2011.

5. Participated in an “**International Workshop on Nonlinear Dynamics**” held at Bhabha Group of Institutions, Kanpur (rural) during 9-16 February, 2012.

6. Presented a paper entitled “**Modeling and analysis of depletion of organic pollutants due to bacteria with explicit dependence on dissolved oxygen**” in “**A National Conference on Mathematical Modelling and Computer Simulation with Applications**” held at Bhabha Group of Institutions, Kanpur (rural) during 17-19 February, 2012.

7. Participated in the “**Latex Training Programme**” held at DST-CIMS, Banaras Hindu University, Varanasi during 19-24 March, 2012.

8. Presented a paper entitled “**Modeling the control of algal bloom in a lake with two discrete time delays**” in “**National Meet of Research Scholars in Mathematical Sciences-2012**” held at Department of Mathematics and DST-CIMS, Faculty of Science, Banaras Hindu University, Varanasi during 18-22 November, 2012.

9. Participated and presented a paper entitled “**Modeling the control of algal bloom in a lake with two discrete time delays**” in “**National Workshop and Conference on Evolution Equations: Theory, Methods & Applications-2012**” held at Department of Mathematics and Statistics, Indian Institute of Technology, Kanpur during 2-8 December, 2012.

10. Presented a paper entitled “**Modeling the effect of human population on the depletion of dissolved oxygen in a water body**” in “**International Conference on India Biodiversity Meet-2013**” held at Indian Statistical Institute, Kolkata during 14-16 March, 2013 and got **Third Prize** under **Best Paper Award** category.

11. Presented a paper entitled **“Modeling the impact of awareness to mitigate algal bloom”** in **“International Conference on Mathematical Modeling and Numerical Simulation”** held at Department of Applied Mathematics, Babasaheb Bhimrao Ambedkar University, Lucknow during 01-03 July, 2013.
12. Participated and presented a paper entitled **“Modeling the impact of awareness on algal bloom”** in **“Advanced Workshop on Mathematical Epidemiology & Differential Equations -2013”** held at Indian Institute of Technology, Patna during 08-13 July, 2013.
13. Participated in **“S. P. Singh Memorial, Advanced Workshop on Partial Differential Equations: Analysis and Applications-2013”** held at DST-CIMS and Dept. of Mathematics, Faculty of Science, Banaras Hindu University, Varanasi during 22-31 July, 2013.
14. Presented a paper entitled **“Modeling the depletion of dissolved oxygen in a water body located near a city”** in **“International Conference on Mathematical Modeling and Computer Simulation with Application”** held at Department of Mathematics and Statistics, Indian Institute of Technology, Kanpur during 31 December, 2013-02 January, 2014.
15. Presented a paper entitled **“Modeling the impact of awareness on the mitigation of algal bloom in a lake”** in the **Best Paper Award** session of **“Recent Trends in Mathematical Modeling and Simulations, ACMS-BHU, 2014”** held at Department of Mathematics, Faculty of Science, Banaras Hindu University, Varanasi during 03-04 February, 2014.
16. Presented a paper entitled **“Modeling the impact of awareness on the mitigation of algal bloom in a lake”** in **“National Conference on Mathematical and Theoretical Biology”** held at Department of Mathematics, Jadavpur University, Kolkata during 20-21 February, 2014.
17. Presented a paper entitled **“Modeling the effects of human population and industrialization on the depletion of dissolved oxygen in a water body”** in **“International Conference on Dynamical Systems and Mathematical Biology-2014”** held at Department of Mathematics, Jadavpur University, Kolkata during 17-19 November, 2014.
18. Presented a paper entitled **“Effect of self and cross-diffusion on the patterns of algae in lakes”** in **“International Conference on India Biodiversity Meet-2014”** held at Agricultural and Ecological Research Unit, Indian Statistical Institute, Kolkata during 21-23 November, 2014.
19. Presented a paper entitled **“Modeling the control of algal bloom in a lake by applying some external efforts with time delay”** in **“Mathematical Analysis and Applications, ACMS-BHU, 2015”** held at Department of Mathematics, Faculty of Science, Banaras Hindu University, Varanasi during 30-31 January, 2015 and won the **Best Paper Award**.
20. Participated in **“Lecture Programme on Mathematical Modeling and Bioinformatics”**

held at Raj Kumar Goel Institute of Technology, Ghaziabad on 21 February, 2015.

21. Presented a poster entitled **“Modeling the impact of awareness on the mitigation of algal bloom in a lake”** in **“International Conference on Mathematical and Computational Biology”** held at Department of Mathematics & Statistics, Indian Institute of Technology, Kanpur during 28 February-3 March, 2015.

22. Delivered a talk entitled **“Modeling the effect of human population on the depletion of dissolved oxygen in a water body”** in **“National Workshop on Water Pollution”** held at SUIIT, Jyoti Bihar, Sambalpur during 14-16 March, 2015.

23. Participated in **“A Mini Workshop on Biomathematics”** held at DST-CIMS and Department of Mathematics, Faculty of Science, Banaras Hindu University, Varanasi during 28-30 March, 2015.

24. Participated in **“Workshop on Basic Statistical Methods and R-Programming”** held in Agricultural & Ecological Research Unit, Indian Statistical Institute, Kolkata, from 25-29 May, 2015.

25. Presented a paper entitled **“Modeling the impact of awareness on the mitigation of algal bloom in a lake”** in **“International Conference on India Biodiversity Meet-2015”** held at Indian Statistical Institute, Kolkata during 16-18 November, 2015.

26. Presented a paper entitled **“Modeling the control of algal bloom in a lake by applying some external efforts with time delay”** in **“National Conference on Mathematical and Theoretical Biology-2015”** held at Department of Mathematics, Jadavpur University, Kolkata during 19-20 November, 2015.

27. Presented a paper entitled **“Spatiotemporal dynamics of a predator-prey system with refuge in prey and alternative food for predator”** in **“International Conference on Mathematical Modeling, Differential Equations, Scientific Computing & Applications under IAMMS”** held at Department of Mathematics and Statistics, Indian Institute of Technology, Kanpur during 27-29 March, 2016.

28. Given two seminars at Department of Mathematics, University of Turin, Italy entitled **“Mathematical models for water pollution and algae control”** on May 19, 2016 and **“Interactive effects of prey refuge and additional food for predator in a diffusive predator-prey system”** on July 12, 2016.

29. Participated in **“National Program on Differential Equations: Theory, Computation & Applications”** held at DST – Centre for Interdisciplinary Mathematical Sciences and Department of Mathematics, Institute of Science, Banaras Hindu University, Varanasi during 24-29 August, 2016.

30. Presented a paper entitled **“Interactive effects of prey refuge and additional food for predator in a diffusive predator-prey system”** in **“International Conference on**

Mathematical Modeling & Simulation” held at Department of Mathematics, Institute of Science, Banaras Hindu University, Varanasi during 29-31 August, 2016.

31. Participated in the **“Workshop on Ecological & Environmental Modeling”** held at GCETT, Berhampore on 25 October, 2016.

32. Presented a paper entitled **“Interactive effects of prey refuge and additional food for predator in a diffusive predator-prey system”** in the **“National Conference of 4th India Biodiversity Meet-2016”** held at Indian Statistical Institute, Kolkata and Government College of Engineering and Textile Technology, Berhampore during 24-27 October, 2016.

33. Presented a paper entitled **“Modeling the effect of awareness among farmers on the mitigation of algal bloom in lakes”** in **“National Seminar on Recent Advances in Computational Mathematics”** held at Department of Applied Mathematics, University of Calcutta, Kolkata during 27-29 December, 2016.

34. Presented a paper entitled **“Interactive effects of prey refuge and additional food for predator in a diffusive predator-prey system”** in **“National Conference on Mathematical and Theoretical Biology”** held at Department of Mathematics, Jadavpur University, Kolkata during 16-17 March, 2017.

35. Presented a paper entitled **“Effect of fertilizers used in agriculture on the algal blooms”** in **“6th China India Japan Korea Mathematical Biology Colloquium Cum Conference”** held at Department of Mathematics & Statistics, Indian Institute of Technology, Kanpur during 23-26 August, 2017.

36. Presented a paper entitled **“Interactive effects of prey refuge and additional food for predator in a diffusive predator-prey system”** in **“Ninth Workshop Dynamical Systems Applied to Biology and Natural Sciences”** held at Dipartimento di Matematica, Università di Torino, Italy during 7-9 February, 2018.

Personal details

Name	: Dr. Pankaj Kumar Tiwari
Marital Status	: Married
Father’s Name	: Lakshmeshwar Tiwari
Date of Birth	: 22 nd March, 1986
Category	: General
Nationality	: Indian
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References

- 1. Prof. Arvind Kumar Misra**
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- 3. Prof. Joydev Chattopadhyay**
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Declaration

I hereby affirm that the information provided above is true and accurate.

(Pankaj Kumar Tiwari)