



# Dr. Pawan Kumar

## Curriculum Vitae

### Publications

#### Research Articles

- 2022 Kumar, P., Dohare, R., **An interaction-based method for detecting overlapping community structure in real-world networks** *International Journal of Data Science and Analytics*, Springer Volume 14, pp 27-44, DOI: <https://doi.org/10.1007/s41060-022-00314-3>
- 2021 Kumar, P., Dohare, R., **Formalising and Detecting Community Structures in Real World Complex Networks** *Journal of Systems Science and Complexity*, Springer Volume 34, pp 180-205, DOI: <https://doi.org/10.1007/s11424-020-9252-3>
- 2019 Kumar, P., Dohare, R., **A neighborhood proximity based algorithm for overlapping community structure detection in weighted networks** *Frontiers of Computer Science*, Springer, Volume 13, Issue 6, pp 1353-1355. DOI: <https://doi.org/10.1007/s11704-019-8098-0>

#### Chapters in Books

- 2020 Kumar, P., Dohare, R., **The Presence of Anti-community Structure in Complex Networks** In: Pant M., Sharma T., Basterrech S., Banerjee C. (eds) *Computational Network Application Tools for Performance Management. Asset Analytics (Performance and Safety Management)*. Springer, Singapore. DOI: [https://doi.org/10.1007/978-981-32-9585-8\\_13](https://doi.org/10.1007/978-981-32-9585-8_13)

### IGNOU Self Learning Materials (SLMs)

#### SLMs for M.Sc.(MACS)

- 2021 **Graph Theory (MMTE-001)**, MPDD, IGNOU, ISBN: 978-93-5568-035-8

#### Units in SLMs for BSCG/BAG

- 2021 **Algebraic Structure of  $\mathbb{R}$** , *Real Analysis(BMTC-133)*, MPDD, IGNOU (ISBN: 978-93-90773-95-4)

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<http://ignou.ac.in/ignou/aboutignou/school/sos/introduction>

- 2021 **Topological Structure of  $\mathbb{R}$** , *Real Analysis(BMTC-133)*, MPDD, IGNOU, (ISBN: 978-93-90773-95-4)
- 2021 **Sequence and Convergence**, *Real Analysis(BMTC-133)*, MPDD, IGNOU (ISBN: 978-93-90773-95-4)
- 2021 **Limits of Sequences**, *Real Analysis(BMTC-133)*, MPDD, IGNOU (ISBN: 978-93-90773-95-4)
- 2021 **Applications**, *Real Analysis(BMTC-133)*, MPDD, IGNOU (ISBN: 978-93-5568-123-2)
- 2021 **Series of Functions**, *Real Analysis(BMTC-133)*, MPDD, IGNOU (ISBN: 978-93-5568-123-2)

## Conferences/Seminars/Workshops

### Invited Talks

- February 28, 2022 **"Application of Graphs"** for the UG and PG students of Govt. College Patharia, Distt. - Damoh(MP)
- February 12, 2021 **"Planar Graphs"** for the UG and PG students of Govt. College Patharia, Distt. - Damoh(MP)
- October 30-31, 2017 **"Analysis of Biological Networks using the igraph R package"** in the 8<sup>th</sup> Bioinformatics Seminar-cum-Hands-on-Training on *R Language & Drug Development* organized by BIF, Jamia Hamdard, New Delhi

### Papers Presented

- May 27-28, 2022 Pawan Kumar, **"How to teach mathematics at school level? "**, National Symposium on Mathematics in the light of NEP 2020 & Indian Knowledge System, organized by Indira Gandhi National Open University, New Delhi in collaboration with Vidya Bharati Uchcha Shiksha Sansthan and VIBHA
- September 10-12, 2020 Pawan Kumar, **"Detecting Community Structure with Pervasive Overlaps in Real World Networks"**, International Conference on Computational Sciences – Modelling, Computing and Soft Computing (CSMCS-2020) organized by the Department of Mathematics, National Institute of Technology, Calicut, Kerala
- November 23-25, 2017 Pawan Kumar and Ravins Dohare, **"The presence of anti-community structure in complex networks"**, 1st International Conference on Recent Advances & Applications in Computer Engineering(RAACE-2017) organized by St. Xavier's College, Jaipur(Raj.)
- March 09-10, 2017 Pawan Kumar and Ravins Dohare, **"Detecting anti-p-weak communities in complex networks using the concept of p-weak communities"**, International Conference on Innovative Trends in Mathematics, Computer & Information Sciences (ITMCIS-17) organized by Dept. of Mathematics and Humanities, Maharishi Markandeshwar University, Ambala(HR)
- February 08-11, 2017 Pawan Kumar and Ravins Dohare, **"Detecting community structure in complex networks - a graph theoretical approach"**, International Conference on Applicable Analysis (ICAA-2017) organized by Dept. of Mathematics, Shaheed Bhagat Singh College (University of Delhi), New Delhi

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- December 16, 2015, Pawan Kumar and Ravins Dohare, National Conference on *Interdisciplinary Approaches in Chemical Sciences* (IACS 2015)  
 Participated
- May 27-31, 2021, Online Workshop on “Recent Trends in Domination and Graph Labelling (RTDGL 2021)”, organized by the Department of Mathematics, Ramanujan College (DU), New Delhi
- November 04, 2017, One Day National Seminar on “Quality Assurance in Higher Education”, organized by the Internal Quality Assurance Cell, Jamia Millia Islamia, New Delhi
- October 28, 2017, Symposium on Network Biology, organized by Centre for Computational Biology, IIT Delhi
- February 27-28, 2015, DBT-BIF 6th National Workshop on *Advances in Computational Biology and Bioinformatics* (ACBB-2015), organized by the Dept. of Computer Science, Jamia Millia Islamia, New Delhi
- June 24 - July 13, 2013, Advanced Instructional School in *Algebraic Combinatorics* conducted in the Indian Statistical Institute, Bangalore
- December 4-5, 2012, Workshop on *Matlab as a research tool* organized by the School of Computer and Information Sciences, IGNOU
- October 15-18, 2012, Training Programme on *Multimedia e-content Development using Open Source Tools* organized by Inter University Consortium for Technology-enabled flexible education & development (IUC-TEFED), IGNOU, New Delhi
- August 23, 2012, Author workshop on *How to write for and get published in scientific journals and publish manuscripts* conducted by Springer in collaboration with the University of Delhi
- March 26 - April 07, 2012, Instructional School for Lecturers in *Real Analysis and Measure Theory*(ISLDU-2012), organized by ATM School and supported by NBHM in the University of Delhi, New Delhi
- March 17-19, 2010, Workshop cum Training Programme on Modern Trends in Celestial Mechanics and Astronomy, organized by Deshbandhu College(University of Delhi), New Delhi
- March 22-26, 2009, Advanced Training Programme on Nonconvex Optimization and its Applications organized by the DST-Centre for Interdisciplinary Mathematical Sciences, Banaras Hindu University, Varanasi

## Courses taught

### PG level

2011 – 2015, 2018-Present	Programming and Data Structures	<i>M.Sc. in Mathematics with Applications in Computer Science</i>
2014 – 2015, 2018-Present	Graph Theory	<i>M.Sc. in Mathematics with Applications in Computer Science</i>
2014 – 2015, 2018-Present	Computer Graphics	<i>M.Sc. in Mathematics with Applications in Computer Science</i>
2020-2021	Differential Equations and Numerical Solutions	<i>M.Sc. in Mathematics with Applications in Computer Science</i>

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### UG level

2011 – 2015, 2018–Present	Analytical Geometry	<i>Bachelors Degree Programme (B.Sc./B.A./B.Com.)</i>
2013 – 2015, 2018–Present	Discrete Mathematics	<i>B.Sc.</i>
2009 – 2010, 2020 – 2021	Differential Equations	<i>B.Sc.(Hons.) Mathematics/BSCG</i>
2018–Present, 2021–Present	Numerical Analysis	<i>Bachelors Degree Programme(B.Sc./B.A.)/BSCG(CBCS)</i>
2009 – 2010	Numerical Methods with C++	<i>B.Sc.(Hons.) Mathematics</i>
2009 – 2010	Analysis, Algebra and Mechanics	<i>B.Sc. Physical Sciences</i>
2009 – 2010	Calculus and Geometry	<i>B.Sc. Physical Sciences</i>
2009 – 2010	Algebra and Geometry	<i>B.A.</i>
2008 – 2009	Mathematics-I,II,III and Numerical Methods	<i>B.Tech.</i>

### Certificate level

2011 – 2015, 2018 – 2020	Preparatory Course in General Mathematics	<i>Bachelors Preparatory Programme</i>
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## Employment

- 2011–Present **Assistant Professor**, SCHOOL OF SCIENCES, INDIRA GANDHI NATIONAL OPEN UNIVERSITY, New Delhi.
- 2009–2011 **Assistant Professor**, DEPARTMENT OF MATHEMATICS, MAITREYI COLLEGE(UNIVERSITY OF DELHI), New Delhi.
- 2008–2009 **Lecturer**, DEPARTMENT OF APPLIED SCIENCES AND HUMANITIES, ECHELON INSTITUTE OF TECHNOLOGY, Faridabad.

## Education

- 2015–2020 **Ph.D. in Mathematics**, *Centre for Interdisciplinary Research in Basic Sciences, JAMIA MILLIA ISLAMIA, New Delhi.*  
Title: Design of Algorithms for Community Structure Detection in Real World Complex Networks
- 2012–2013 **Post Graduate Diploma in Distance Education**, INDIRA GANDHI NATIONAL OPEN UNIVERSITY, New Delhi, *%Marks – 77.00* .
- 2006–2008 **M.Sc. in Mathematics**, INDIAN INSTITUTE OF TECHNOLOGY, New Delhi, *CGPA – 6.59* .
- 2003–2006 **B.Sc.(Hons.) in Mathematics**, DAYALBAGH EDUCATIONAL INSTITUTE, Agra, *%Marks – 74.50* .