Vitae: Dr. Mudassar Imran

Ajman University, UAE, Ajman.

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Education

Jan02- Aug06

Ph.D.: Mathematics, Arizona State University, Tempe, AZ. USA

Dissertation: Mathematical Models in Biofilms and Antibiotic Treatment

Supervisor: Professor Hal Smith.

Sep98- Nov01

MS: Mathematics, Ohio University, Athens, OH. USA

Current Job:

Aug2022: Associate Professor**,** Ajman University, United Arab Emirates.

Experience

Feb2021-Aug22:	Professor Namal University, Pakistan
Nov2017-Feb21:	Associate Professor, Gulf University of Science and Technology.
Jan2014-Nov17:	Assistant Professor Gulf University of Science and Technology.
Aug2010-Jan14:	Assistant Professor: Department of Mathematics, LUMS, Lahore
May2010-Aug10:	Sessional Faculty: Department of Mathematics, McMaster University
Sep2009-May10:	Sessional Faculty: Department of Mathematics University of Manitoba
Sep2007- Sep09:	Postdoctoral Fellow, Department of Mathematics McMaster University
Oct2006-Sep07:	Postdoctoral Fellow, Center of Toxicology and Pharmacokinetic North Carolina State University, USA
Jan2002-Aug06:	Graduate Assistant, Department of Mathematics and Statistics at Arizona State University, USA
Sep1999-Dec01:	Graduate Assistant, Department of Mathematics, Ohio University

Research Interest

Differential Equations, Dynamical Systems, Mathematical Models in Biology, Data Fitting.

Courses Taught Graduate Level

Mathematical Biology I, Mathematical Modeling, Mathematical Biology II, Theory of Differential Equations, Non-Linear Dynamical Systems, Partial Differential Equations, Numerical Analysis I

Courses Taught Undergrad level

College Algebra, Basic Calculus, Calculus with analytical geometry I, Calculus with analytical geometry II, Calculus with analytical geometry III, Linear Algebra and Differential Equations I, Introduction to Differential equations

Research Publications

1. Adnan Khan, Mohsin Ali, Wizda Iqbal and Mudassar Imran, "Effect of high and low risk susceptible in the transmission dynamics of COVID-19 and control strategies", PLOS ONE, 2021, IF 3.24
2. Danish Ahmed, Ali Ansari, Mudassar Imran, Michael Bonsall, "Mechanistic modeling of COVID-19 and the impact of lockdowns on a short-term scale", PLOS ONE, 2021, IF 3.24
3. M. Usman, S. Abdallah, Mudassar Imran, "Nonlinear and Stability Analysis of a Ship with General Roll-Damping Using an Asymptotic Perturbation Method", Mathematical and Computational Applications" Vol 26, 2021, IF 0.4
4. Mohsin Ali, Mudassar Imran, and Adnan Khan, "Analysis and prediction of the COVID-19 outbreak in Pakistan", Journal of Biological Dynamics", Vol 14, 2020, IF 1.1
5. Mohsin Ali, Syed Touqeer H. Shah, Mudassar Imran, and Adnan Khan, "The Role of Asymptomatic Class, Quarantine and Isolation in the transmission of COVID-19", Journal of Biological Dynamics", Vol 14, 2020, IF 1.1

6. M. Ahmed, Mudassar Imran, Transmission dynamics model of coronavirus COVID-19 for the outbreak in most affected countries" International Journal of Interactive media and artificial intelligence, Vol 6, 2020 IF 1.3
7. M Imran, M Ben-Romdhane, A Ansari and H Temimi, Numerical Study of an Influenza Epidemic Dynamical Model with Diffusion, Discrete and Continuous Dynamical Systems Series S, Vol 13(10), (2019), IF 1.23
8. M. Imran, M. Usman, T. Malik, A. Ansari, "Mathematical analysis of the role of hospitalization/isolation in controlling the spread of Zika fever", Virus Research, Vol 255, (2018), (IF 2.5).
9. A. Khan, M. Imran, "Optimal Dosing Strategies against Susceptible and Resistant Bacteria", Journal of Biological Systems, Vol 26(1), (2018), (IF0.51)
10. M. Imran, Y. Raffoul, M. Usman, C. Zhang, "A Study of Bifurcation Parameters in Travelling Wave Solutions of a Damped Forced Korteweg de Vries-Kuramoto Sivashinsky Type Equation", Discrete and continuous dynamical system series B, Vol 11(4), (2017), (IF 0.99)
11. M. Imran, M. Usman, M. Ahmad, A. Khan, "Transmission dynamics of Zika fever-A SEIR based model", Differential equation and dynamical systems, (2017)
12. M. Imran, A. Khan, A. Ansari. M. Shah, "Modeling Transmission Dynamics of Ebola Virus Disease", *Int. Journal Biomathematics*, Vol 10(4), (2017), (IF 0.93)
13. M. Dur-e-Ahmad, M. Usman, A. Khan, M. Imran, "Optimal control analysis of Ebola disease with control strategies of quarantine and vaccination", *Infectious diseases of poverty*, Vol 5(1), (2016), (IF 2.4)
14. M. Usman, G. Flora, C. Yakopcic, M. Imran, "A Computational Study and Stability Analysis of a Mathematical Model for In Vitro Inhibition of Cancer Cell Mutation" *Int. Journal of Applied and Computational Mathematics*, Vol 3(3), (2016)
15. M. Imran, M. Tufail, A. Ansari, A. Khan, "Mathematical Analysis of Swine Influenza Epidemic Model with Optimal Control", *Japan Journal of Industrial and Applied Mathematics*, Vol 33(1), (2016), (IF 0.31)
16. M. Waleed, M. Imran, A. Khan, "Stochastic Analysis of an Influenza Epidemic Model", Int. Journal Applied and Computational Mathematics, (2015)

17. T. Malik, M. Imran, R. Jaywarman, “Optimal Control with Multiple Human Papillomavirus Vaccines”, *Journal of Theoretical Biology*, Vol 393, (2016) (IF 2.11)
18. A. Khan, M. Waleed, M. Imran, “Mathematical Analysis of an Influenza Epidemic Model, Formulation of Different Controlling Strategies using Optimal Control and Estimation of Basic Reproduction Number”, *Mathematical and Computer Modelling of Dynamical Systems*, (2015), (IF 0.98)
19. A. Khan, M. Naveed, M. Dur-e-Ahmad, M. Imran, “Estimating the basic reproductive ratio for the Ebola outbreak in Liberia and Sierra Leone”, *Infectious Diseases of Poverty Editorial*, Vol 4 (13), (2015), (IF 4.11)
20. I. Naeem, D. Khan, M. Imran, “Analytical solutions of time-space fractional advection-dispersion and Whitham-Broer-Kaup equations” *Pramana - journal of physics*, Vol 83 (6), (2014), (IF 0.56)
21. M. Usman and M. Imran, “A generalization of the Poincare Carton Integral Invariant for a Nonlinear Nonholonomic Dynamical System” *Dynamics of Continuous, Discrete and Impulsive System Series A: Mathematical Analysis*, Vol 21, (2014)
22. M. Imran, H. Smith, “A Model of Optimal Dosing of Antibiotic Treatment in biofilms”, *Mathematical Biosciences and Engineering*, Vol 11 (3*)*, (2014), (IF 1.19)
23. T. Malik, P. Salceanu, A. Mubayi, A. Tridane, M. Imran, “West Nile dynamics; Virus transmission between domestic and wild bird populations through vectors”, *Canadian Applied Mathematics quarterly* (2014)
24. A. Khan, M. Hassan, M. Imran, “Estimating the Basic Reproduction Number for Single-Strain Dengue Fever Epidemics”, *Journal of Infectious Diseases of Poverty*, Vol 3 (1), (2014), (IF 4.11)
25. M. Imran, S. Sial, A. Khan, “Transmission Dynamics of the Hepatitis C with Control Strategies”, *Journal of Computational Medicine*, Vol 18, (2014)
26. M. Dur-e-Ahmad, M. Imran, A. Khan, “Analysis of a Mathematical Model of Emerging Infectious Disease Leading to Amphibian Decline”, *Abstract and Applied Analysis Volume 2014*, Article ID 145398, (2014), (IF 1.2)

27. M. Imran, H. Rafique, A. Khan, T. Malik, “A model of bi-mode transmission dynamics of hepatitis C with optimal control”, *Theory in Biosciences*, Vol 133 (2), (2013), (IF 1.1)
28. M. Imran, M. Hassan, M. Ahmad, A. Khan, “A comparison of a deterministic and stochastic model for Hepatitis C”, *Journal of Biological Dynamics*, Vol 7, No. 1, 276-301, (2013), (IF 1.11)
29. M. Waleed, M. Imran, M. Ahmad, A. Gul, “Exposure to Mosquito Repellants and Potential Risk Factors of Congestion, A cross-sectional study”, *World Applied Sciences Journal*, Vol. 24, No. 5, (2013), (IF 0.23)
30. A. Khan, M. Hassan, M. Imran, “The Effects of a Backward Bifurcation on a Continuous Time Markov Chain Model for the Transmission Dynamics of Single Strain Dengue Virus”, *Applied Mathematics*, Vol. 6, 663-674, (2013), (IF 0.19)
31. M. Safi, M.r Imran, A. Gumel, “Threshold dynamics of a non-autonomous SEIRS model with quarantine and isolation”, *Theory in Biosciences*, Vol. 131, No. 1, 19-30, (2012) (IF 0.92)
32. M. Rahim, M. Imran, “Dynamical analysis of a delay model of phytoplankton–zooplankton interaction”, *Applied Mathematical Modelling*, Vol. 2, No. 36, 638-647, (2012), (IF 1.67)
33. M. Katherine, M. Imran G. Wolkowicz, “Competition in the presence of a virus in an aquatic system: an SIS model in the chemostat”, *Journal of Mathematical Biology*, Vol. 64, No. 6, 1043-1086, (2012), (IF 2.37)
34. M. Sajid, N. Ali, Z. Abbas, T. Javed, and M. Imran, “Some two-dimensional flows with couple stresses”, *Journal of Engineering Physics and Thermophysics*, Vol. 85, No. 3, 599-603 (2012), (IF 0.4).
35. M. Imran, T. Malik, S. Garba, “Mathematical Analysis of the Role of Antiviral in Controlling the Spread of the H1N1 Influenza Pandemic”, *Electronic Journal of Differential Equations*, 5, 2011 1-21, (2011), (IF 0.4)
36. M. Dur-e-Ahmad, M. Imran, A. Gul, “Calcium Dynamics in Dendritic Spines: A Link to Structural Plasticity”, *Mathematical Biosciences*, Vol. 230, No. 2, 55-82, (2011), (IF 1.78)

37. R Baynes, X Xia, M Imran, J Riviere, "Quantification of chemical mixture interactions modulating dermal absorption using a multiple membrane fiber arrays", *Chem. Res. Toxicol*., Vol. 21, 591-599, (2008), (IF 3.66)
38. H. Lee, M. Imran, N. Monteiro-Riviere, V. Colvin, W. Yu, and J. Riviere, "Biodistribution of Quantum Dot Nanoparticles in Perfused Skin: Evidence of coating Dependency and Periodicity in Arterial Extraction" *Nano Letters*, Vol. 7, No. 9, (2007). **Impact Factor 13.18**
39. M. Imran, and H. Smith, "The Dynamics of Bacterial Infection, Innate Immune Response, and antibiotic Treatment", *Discrete and Continuous Dynamical Systems B, Special Issue on Differential Equations in Mathematical Biology*, Vol. 8, No. 1, (2007), (IF 0.88)
40. M. Imran, and H. Smith, "A Mathematical Model of Gene Transfer in a Biofilm", Mathematics for Ecology and Environmental Sciences, series: Biological and Medical Physics, Biomedical Engineering. *Springer*, 93-123 (2007), (IF 1.61)
41. M. Imran, and H. Smith, "The Pharmacodynamics of Antibiotic Treatment" *Comp. & Math Methods in Medicine*, Vol. 7, No. 4, 229-263 (2006), (IF 1.07)
42. M. Imran, D. Jones, and H. Smith, "Biofilms and the Plasmid maintenance question" *Mathematical Biosciences*, 193, 183-204 (2005), (IF 1.78)

Publications: Abstracts of Professional Presentations

- M Imran, E Baynes, X Xia, J Riviere, **"**Use of a multi-fiber approach to quantify chemical mixture interactions modulating dermal absorption", The Toxicologist. S-1,102, 1556, p.319, (2008)
- H Lee, M Imran, S Mason, N Monteiro-Riviere, J Riviere, "Pharmacokinetic modeling and implications of periodicity in arterial extraction of quantum dot nanoparticles", The Toxicologist. S-1, 102, 1402, p.287, (2008).
- N Monteiro-Riviere, H. Lee, L. Zhang, M Imran, V Colvin, W Yu, and Jim E. Riviere, "Pharmacokinetics and Biodistribution of Quantum Dot Nanoparticles in Isolated Perfused Skin", Interagency Workshop on the Environmental Implications of Nanotechnology, p 3, (2007)
- J Riviere JE, H Lee, M Imran, Yu W, Colvin VL, N Monteiro-Riviere, "Pharmaco-kinetic modeling of quantum dot nanoparticle biodistribution in

isolated perfused skin", The 2nd International Nanotoxicology Conference, San Servolo Servizi, Venice, Italy, p.14, (2007).

- J Riviere, H Lee, M Imran, V Colvin, W Yu, N Monteiro Riviere, "Development of a toxicokinetic model to quantitate quantum dot distribution in isolated perfused skin. Toxicity of Nanomaterials", International Congress of Toxicology, PW11: 251, (2007)

Citations in Nature

My research work is cited in Nature

- http://www.nature.com/nprot/journal/v6/n10/abs/nprot.2011.381.html
- http://www.nature.com/jid/journal/v129/n5/abs/jid200963a.html
- https://www.nature.com/articles/ncomms4796

Poster Presentation

- C. S. Pitts, C. E. Smith, R. E. Baynes, J. D. Brooks, M. Imran, and J. E. Riviere, "Markov Chain Model for Quantitating Dermal Absorption from Complex Mixtures" Society of Toxicology's 46th Annual Meeting, March 25–29, 2007.

Research Grants

- M. Imran, A research grant of 30000$, LUMS 2010
- I. Naeem, M. Imran, Analysis of a Hepatitis C model with optimal control of quarantine, Faculty Initiative Funds, 6000$, 2013
- A. Khan, S. Sial, M. Imran, Control of Bacterial Growth in a Biofilm, Faculty Initiative Funds, 2013, 8000$, 2013

Invited Talks

- Society for Mathematical Biology, University of Utah, July 17-20, 2017
- SIAM conference on The Life Sciences, Boston USA, July 11-14, 2016
- SIAM Conference on Control and its applications, Paris France, July 8-10, 2015
- Optimal Decision-Making in Economics, Healthcare and Sustainable Ecosystems, Khalifa University, UAE, Dec 2014

- Society for Mathematical Biology, Arizona State University, June 2013
- CMS summer conference, Dalhousie University Halifax, June 2013
- Centre for Advanced Studies in Mathematics, LUMS, Nov 2011
- CMS winter conference, University of British Columbia, December 2010
- CMS summer conference, Memorial University Newfoundland, July 2009
- Mathematical Biology Seminar at the Department of Mathematics and Statistics at McMaster University, Oct 03, 2007
- Mathematical Biology Seminar at the Department of Mathematics and Statistics North Carolina State University, Feb 20, 2007
- SIAM Conference on the Life Sciences, Raleigh, North Carolina, July 31-August 4, 2006
- Workshop on Mathematical Models in Biology and Medicine, Arizona State University, Feb 2006
- Emerging Paradigms in Nonlinear Science, Los Alamos National Laboratory, Jan 2006
- CMS Winter 2005 Meeting University of Victoria, Victoria, BC, December 2005
- Mathematical Biology Seminar at the Department of Mathematics and Statistics at Arizona State University, Mar 2004

Pedagogical Training

- Fall and spring 2005-06: Preparing Future Faculty, two semesters, Arizona State University
- Fall 2003: Teaching training seminar, one semester, Arizona State University
- Summer 2002: TA training workshop, one week, Arizona State University
- Fall 1999: Graduate teaching seminar, one semester, Ohio University

Professional Development

- Focus Program Towards Mathematical Modeling of Neurological Disease from Cellular Perspectives (Four weeks' workshop), Field Institute of Research in Mathematical Sciences Toronto, ON. May 25-June 5, 2012
- Mathematical aspects of Computational Biology (Two weeks' workshop), Mathematical Sciences Research Institute, University of California Berkeley, CA. June 2006
- Summer graduate program on Ecology and Evolution (Two weeks' workshop), Mathematical Biosciences Institute, Ohio State University, OH. July 17-Aug 4, 2006
- Rocky Mountain Mathematics consortium conference on Discrete Dynamical Systems and their Application to Population Dynamics (Two weeks' workshop), University of Wyoming, WY. July 7-18, 2003

Conferences organized

- National Workshop on mathematical modeling and Information technology for Health, Centre for advanced studies in mathematics, LUMS, (Dec 2011)
- Workshop on deterministic and stochastic modeling in Epidemiology, University of San Marcose, Peru, (July 2013)

Graduate students thesis Supervised

i. Mahim Naveed, (MS thesis) (UMASS, USA), "Estimation of the basic reproductive number of Ebola outbreak in Liberia and Sierra Leone", Department of Mathematics, LUMS, 2015

ii. Asgher Ali, (MS thesis), "Mathematical study of disease based extinction in an amphibian population under allee effect", Department of Mathematics, LUMS, 2016

iii. Mohsin Ali, (MS thesis), "Cross-immunity Induced Analysis of Transmission Dynamics of Two Strain Influenza with Hospitalization", Department of Mathematics, LUMS, 2016

BS/BSc Student Supervised

i. Muhammad Hassan (ETH Zurich), “Transmission dynamics of two strain dengue virus and effect of backward bifurcation of continuous-time Markov chain model of dengue epidemic”, Department of Mathematics, School of Science and Engineering, LUMS, 2012
ii. Kanwal Rizvi (New York polytechnic college), “Transmission dynamics of one strain dengue virus”, Department of Mathematics, School of Science and Engineering, LUMS 2012
iii. Hassan Rafique (Western Illinois University), “Dynamics of Hepatitis C disease with different controlling strategies”, Department of Mathematics, School of Science and Engineering, LUMS 2012
iv. Saad Qadeer (University of California Berkeley), “Effect of Optimal dosing in antibiotic treatment” Hassan Rafique”, Department of Mathematics, School of Science and Engineering, LUMS 2013
v. Anum Zahra, “A mathematical model of Flu Epidemic in USA 2012”, Department of Mathematics, School of Science and Engineering, LUMS 2012
vi. Muhammad Waleed, “Exposure to Mosquito Repellants and Potential Risk Factors of Congestion, A cross-sectional study 2013
vii. Saman Hussian (Harvard University), “Transmission dynamics of two strain dengue; Department of Biology School of Science and Engineering, LUMS 2013

Reviewer

- Antimicrobial Agents and Chemotherapy
- Journal of Biological Dynamics
- Journal of Biological Systems
- American Math Society
- Journal of Biological Dynamics

Professional Affiliation

- CAIMS (Canadian Applied and Industrial Mathematical Society)
- SMB (Society for Mathematical Biology)
- SIAM (Society for Industrial and Applied Mathematics)
- CMS (Canadian Mathematical Society)

Research/Teaching Award

Best Graduate Student Researcher/Teacher Award Department of Mathematics Arizona State University, May 2005

Undergrad Chair

- Undergraduate chair, Aug2012-Jan 2014 (LUMS)

Committee Services

- Research committee, Jan2014-May2015 (GUST)
- Research center creation committee, Jan2014-May2015 (GUST)
- New faculty hiring committee member, Jan2014-May2014 (GUST)
- Member of the faculty search committee. Aug 2011-June 2012 (LUMS)
- Member of the graduate program committee, Jan2011-Jan2014 (LUMS)
- Convener of the research committee, Jan2012-Jan2014 (LUMS)
- Member of the research committee, Aug2012-Jan2014 (LUMS)
- Undergrad project coordinator Aug2011-June2012 (LUMS)
- Chair departmental research committee, Aug2011-Sep 2012 (LUMS)
- Department budget committee. June 2012-Jan2014 (LUMS)
- Undergrad courses coordinator, Aug2011-Jan2014 (LUMS)

References

1. Professor Abba Gumel
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2. Dr. Muhammad Usman
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3. Dr. Malik Tufail
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