Dr. Ghazala Akram

Department of Mathematics
University of the Punjab
Quaid-i-Azam Campus, Lahore
Post Code 54590, Pakistan.
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Qualification

May 2012-January 2013	**Postdoc** School of Mathematical Sciences, Queen Mary, University of London,UK Advisor: Prof. Christian Beck
2001-2007	**Ph.D. (Computational Mathematics)** University of the Punjab, Lahore, Pakistan. **Thesis: Use of *Spline Functions in Solving Boundary-Value Problems*** Advisor: Prof. Dr. Shahid S. Siddiqi

Present Status

30 April, 2012-present	Associate Professor (BPS)
16 June, 2008-29 April, 2012	Assistant Professor (TTS)
21 November, 2000-15 June, 2008	Lecturer

Fields of Interest

Computational Mathematics
1. Theory of Spline Functions

Academic Awards

1. Successfully completed Post Doctoral Fellowship at Queen Mary College, University of London under Post Doctoral Fellowship Programme Phase-II (Batch-V)
2. *Gold Medal in M.Sc. Mathematics,* University of the Punjab.
3. **Best Departmental Teacher Award** (Department of Mathematics), for the year 2014.
4. A shield along with a prize of Rs. 5000/- was awarded by the worthy Vice Chancellor, University of the Punjab in recognition of the second position obtained in *International Conference on Mathematics and its Applications in Information Technology* held at LUMS in the category of young Ph. D. scholars.

5. Second prize certificate was awarded among the young Ph. D. scholars category in the competition organized by the ***LUMS International Conference on Mathematics and its Applications in Information Technology*** at LUMS in collaboration with School of Mathematical Sciences, GC University Lahore, Nov. 27th to 30th November 2005, which was evaluated by the panel of foreign experts and ranked among the top three positions.
6. Third prize certificate along with a cash price of Rs. 3000 was awarded among the young Ph.D. scholars category in the competition organized by the ***Second World Conference on 21st Century Mathematics,*** 2005 at School of Mathematical Sciences, GC University, Lahore, Mar 4-6, 2005 which was evaluated by the panel of foreign experts and ranked among the top three positions.
7. Cash prize of Rs. 10,000/- was awarded by the worthy Vice Chancellor, University of the Punjab in recognition of the online launching of ***Punjab University Journal of Mathematics***.

Professional Services/Activities

1. Managerial Secretary of Punjab University Journal of Mathematics (From November, 2000 to January, 2009)
2. Associate Editor of Punjab University Journal of Mathematics
3. Member of Doctoral Programme Committee
4. Coordinator of Departmental Library Committee
5. Member of Departmental Examination Committee
6. Member of Departmental Scholarship Committee
7. Member of Departmental Tenure Track Review Committee
8. Member of Departmental Disciplinary Committee
9. Member of Departmental Development Committee
10. Incharge of M.Sc. Morning and Evening Admission, 2013
11. Member of Board of Studies in Mathematics
12. Admission of M. Phil. and Ph.D. Programmes
13. Admission of M.Sc. programme.
14. Advisor Students (From Nov. 2000 to 2006).
15. Member of Departmental purchase committee
16. Coordinator of B.S. Programme(From Oct. 2015 to Aug. 2016)
17. Coordinator of M.Phil/Ph.D. Programme(From 29 Aug. 2016)
18. Member of Departmental Best Teacher /Employee Award Committee
19. Member of House Allotment Committee for Teaching Staff of University

List of Publications

Published
1). ***End Conditions for Interpolatory Septic Spline***
   Ghazala Akram and Shahid S. Siddiqi,
   International Journal of Computer Mathematics, 82 (12): 1525 - 1540, **2005**

2). ***Solutions of Fifth Order Boundary-Value Problems Using Non-Polynomial Spline Technique***
Shahid S. Siddiqi and Ghazala Akram,
Applied Mathematics and Computation, 175 (2): 1574-1581, **2006**

3). ***Solutions of Sixth Order Boundary-Value Problems Using Non-Polynomial Spline Technique***
Ghazala Akram and Shahid S. Siddiqi,
Applied Mathematics and Computation, 181: 708-720, **2006**

4). ***End Conditions for Interpolatory Sextic Spline***
Shahid S. Siddiqi and Ghazala Akram
International Journal of Computer Mathematics, 83 (5-6): 473-485, **2006**

5). ***Nonic Spline Solutions of Eighth Order Boundary Value Problems***
Ghazala Akram and Shahid S. Siddiqi,
Applied Mathematics and Computation, 182 (1): 829-845, **2006**

6). ***Solutions of Twelfth Order Boundary Value Problems using Thirteen Degree Spline***
Shahid S. Siddiqi and Ghazala Akram,
Applied Mathematics and Computation, 182 (2): 1443-1453, **2006**

7). ***Sextic Spline Solutions of Fifth Order Boundary Value Problems***
Shahid S. Siddiqi and Ghazala Akram
Applied Mathematics Letters, (20): 591-597, **2007**

8). ***Solution of the System of Fourth Order Boundary Value Problems using Non-Polynomial Spline Technique***
Shahid S. Siddiqi and Ghazala Akram,
Applied Mathematics and Computation, (185): 128-135, **2007**

9). ***Solution of Tenth-Order Boundary Value Problems using Eleventh Degree Spline***
Shahid S. Siddiqi and Ghazala Akram,
Applied Mathematics and Computation, (185): 115-127, **2007**

10). ***Solution of the system of fourth order boundary value problems using cubic spline***
Shahid S. Siddiqi and Ghazala Akram
Applied Mathematics and Computation, (187): 1219-1227, **2007**

11). ***Quintic Spline Solutions of Linear Sixth-Order Boundary Value Problems***
Shahid S. Siddiqi, Ghazala Akram and Saima Nazeer
Applied Mathematics and Computation, (189): 887-892, **2007**

12). ***Nonpolynomial Sextic Spline Method for the Solution along with Convergence of Linear Special Case Fifth-Order Two-Point Boundary Value Problems***
Shahid S. Siddiqi, Ghazala Akram and Salman Amin Malik
Applied Mathematics and Computation, (190): 532-541, **2007**

13). ***Solution of 10th-Order Boundary Value Problems using Non-Polynomial spline Technique***
Shahid S. Siddiqi and Ghazala Akram
Applied Mathematics and Computation, (190): 641-651, **2007**

14). ***Numerical Solution of a System of Fourth Order Boundary Value Problems using Cubic Non-Polynomial Spline Method***
Shahid S. Siddiqi and Ghazala Akram
Applied Mathematics and Computation, (190): 652-661, **2007**

15). ***Solution of Eighth Order Boundary Value Problems using Non-Polynomial spline Technique***
Shahid S. Siddiqi and Ghazala Akram
International Journal of Computer Mathematics, 84 (3): 347-368, **2007**

16). ***Quintic Spline Solutions of Fourth Order Boundary-Value Problems***
Shahid S. Siddiqi and Ghazala Akram
International Journal of Numerical Analysis and Modeling, Canada, 5 (1): 101-111, **2008**

17)*. **Quartic Spline Solution of Linear Fifth Order Boundary Value Problems***
Shahid S. Siddiqi, Ghazala Akram and Arfa Elahi
Applied Mathematics and Computation, (196): 214-220, **2008**

18). ***Septic Spline Solutions of Sixth Order Boundary-Value Problems***
Shahid S. Siddiqi and Ghazala Akram,
Journal of Computational and Applied Mathematics, (215): 288-301, **2008**

19). **S*olution of Twelfth Order Boundary Value Problems using Non Polynomial spline Technique***
Shahid S. Siddiqi and Ghazala Akram
Applied Mathematics and Computation, 199, 2 (1): 559-571, **2008**

20). ***Solution of Eighth Order Boundary Value Problems using Variational Iteration Technique***
Shahid S. Siddiqi, Ghazala Akram and Sabahat Zaheer
European Journal of Scientific Research, 30 (3): 361-379, **2009**

21). ***Solution of Tenth Order Boundary Value Problems using Variational Iteration Technique***
Shahid S. Siddiqi, Ghazala Akram and Sabahat Zaheer
European Journal of Scientific Research, 30 (3): 326-347, **2009**

22). ***Solution of Eleventh Order Boundary Value Problems using Variational Iteration Technique***
Shahid S. Siddiqi, Ghazala Akram and Imran Zulfiqar Cheema
European Journal of Scientific Research, 30 (4): 505-525, **2009**

23). ***Variational Iteration Method for the Solution of Twelfth Order Boundary Value Problems***
Shahid S. Siddiqi, Ghazala Akram and Imran Zulfiqar Cheema
European Journal of Scientific Research, 33 (1): 96-114, **2009**

24). ***End Conditions for Interpolatory Nonic Splines***
Shahid S. Siddiqi and Ghazala Akram
South East Asian Bulletin of Mathematics, (34): 469-488, **2010**

25). ***Solution of First Order Singularly Perturbed Initial Value Problem in Reproducing Kernel Hilbert Space***
Ghazala Akram and Hamood Ur Rehman
European Journal of Scientific Research, 53 (4): 516-523, **2011**

26). ***Solutions of Fifth Order Singularly Perturbed Boundary Value Problems Using Non- Polynomial Spline Technique***
Shahid S. Siddiqi, Ghazala Akram and Ammara Kanwal,
European Journal of Scientific Research, 56 (3): 415-425, **2011**

27). ***Solution of Fifth Order Boundary Value Problems in Reproducing Kernel Space***
Ghazala Akram and Hamood Ur Rehman,
Middle East Journal of Scientific Research, 10 (2): 191-195, **2011**

28). ***Quartic Spline Solution of a Third Order Singularly Perturbed Boundary Value Problem***
Ghazala Akram
ANZIAM Journal, (53), E44-E58, **2012**

29). ***Solution of Seventh Order Boundary Value Problem by Differential Transformation Method***
Shahid S. Siddiqi, Ghazala Akram and Muzammal Iftikhar
World Applied Sciences Journal, 16 (11): 1521-1526, **2012**

30). ***Solution of a Fourth Order Singularly Perturbed Boundary Value Problem Using Quintic Spline***
Ghazala Akram and Nadia Amin
International Mathematical Forum, 7 (44): 2179 - 2190, **2012**

31). ***Solution of Seventh Order Boundary Value Problems by Variational Iteration Technique***
Shahid S. Siddiqi, Ghazala Akram and Muzammil Iftikhar,
Applied Mathematical Science, 6 (94): 4663-4672, **2012**

32). ***Solution of Fourth Order Obstacle Problems Using Quintic B-Splines***
Shahid S. Siddiqi, Ghazala Akram and Kalsoom Arshad
Applied Mathematical Sciences, 6 (94): 4651-4662, **2012**

33). ***Solution of Delay Differential Equations using Nonic Spline Collocation Methods***
Shahid S. Siddiqi, Ghazala Akram and Huzaima Baig
International Mathematical Forum, 7 (45-48): 2279-2292, **2012**

34). ***Reproducing Kernel Method for Fourth Order Singularly Perturbed Boundary Value Problem***
Ghazala Akram and Hamood ur Rehman
World Applied Sciences Journal 16 (12): 1799-1802, **2012**

35). ***Solution of the System of Fourth Order BoundaryValue Problem using Reproducing kernel Space***
Ghazala Akram and Hamood Ur Rehman, Journal of Applied Mathematics and Informatics, 31 (1-2): 55-69, **2013**

36). ***Numerical solution of eighth order boundary value problems in reproducing Kernel space***
Ghazala Akram and Hamood Ur Rehman
Numerical Algorithms, (62): 527-540, **2013**

37). ***A Numerical Solution of a Convection-Dominated Equation Arising in Biology***
Ghazala Akram and Hamood ur Rehman
Research Journal of Applied Sciences, Engineering and Technology, 5(2): 507-509, **2013**

38). ***Solution of Linear Third Order Multi-point Boundary Value Problem Using RKM***
Ghazala Akram, Mohammad Tehseen, Shahid S. Siddiqi and Hamood Ur Rehman
British Journal of Mathematics and Computer Science, 3(2): 180-194, **2013**

39). ***Solution of Fourth Order Singularly Perturbed Boundary Value Problem Using Septic Spline***
Ghazala Akram and Afia Naheed
Middle-East Journal of Scientific Research, 15(2): 302-311, **2013**

40). ***A Numerical Solution to the Nonlinear Fifth Order Boundary Value Problems***
Ghazala Akram and Hamood ur Rehman
International Journal of Applied Science and Engineering, 11 (4): 415-422, **2013**

41). ***Solutions of a Class of Sixth Order Boundary Value Problems using the Reproducing Kernel Space***
Ghazala Akram and Hamood Ur Rehman
Abstract and Applied Analysis, Volume **2013**, Article ID 560590, 8 pages

42). ***Homotopy Perturbation Method with Reproducing Kernel Method for Third Order Nonlinear Boundary Value Problems***
Ghazala Akram and Hamood ur Rehman
Journal of Basic and Applied Scientific Research, 4 (1): 60-67, **2014**

43). ***Numerical Solution of Seventh Order Boundary Value Problems Using the Reproducing Kernel Space***
Ghazala Akram and Hamood ur Rehman
Research Journal of Applied Sciences, Engineering and Technology, 7(4): 892-896, **2014**

44). ***Solution of the System of Fifth Order Boundary Value Problem using Quartic Spline***
Ghazala Akram and Shahid S. Siddiqi
Research Journal of Applied Sciences, Engineering and Technology, 7(22): 4696-4701, **2014**

45). ***Quartic Non-Polynomial Spline Solution of a Third Order Singularly Perturbed Boundary Value Problem***
Ghazala Akram and Imran Talib
Research Journal of Applied Sciences, Engineering and Technology, 7(23): 4859-4863, **2014**

46). ***Solution of Seventh Order Boundary Value Problems using Adomian Decomposition Method***
Shahid S. Siddiqi, Muzammil Iftikhar and Ghazala Akram
Journal of Advanced Physics, 3(1), 92-96, **2014**

47). ***Hierarchical Cascade Model Leading to 7-th Order Initial Value Problem***
Ghazala Akram and Christian Beck
Applied Numerical Mathematics, 91: 89-97, **2015**

48). ***Solution of the System of Fifth Order Boundary Value Problem using Sextic Spline***
Ghazala Akram
Journal of the Egyptian Mathematical Society, 23(2): 406-409, **2015**

49). ***Solution of Fourth order Three-point Boundary Value Problem using ADM and RKM***
Ghazala Akram and Irfan Ahmad Aslam
Journal of the Association of Arab Universities for Basic and Applied Sciences, 20:61-67, **2016**

50). ***An Exponential Spline Technique for Solving Fractional Boundary Value Problem***
Ghazala Akram and Hira Tariq
Calcolo, 53(4), 545–558, **2016**

51). ***Numerical solution for solving special eighth-order linear boundary value Problems using Legendre Galerkin method***
Zaffer Elahi, Ghazala Akram and Shahid S. Siddiqi
Mathematical Sciences, 10(4), 201–209, **2016**

52). ***Solitary wave solutions of the Schäfer–Wayne short-pulse equation using two reliable methods***
Akram, G. & Batool, F.
Optical and Quantum Electron (2017) 49: 14 **2017**.

53). ***Quintic Spline Technique for Time Fractional Fourth-Order Partial Differential Equation***
Hira Tariq and Ghazala Akram
Numerical Methods for Partial Differential Equations, 33(2), 445–466, **2017**

<u>In Press</u>

1). ***Cubic Polynomial Spline Scheme for Fractional Boundary Value Problems with Left and Right Fractional Operators***
Ghazala Akram and Hira Tariq
International Journal of Applied and Computational Mathematics
DOI 10.1007/s40819-016-0145-z

2). ***Quintic spline collocation method for fractional boundary value problems***
Ghazala Akram and Hira Tariq
Journal of the Association of Arab Universities for Basic and Applied Sciences
DOI.org/10.1016/j.jaubas.2016.03.003

3). ***Residual power series method for solving time-space-fractional Benney-Lin equation arising in falling film problems***
Journal of Applied Mathematics and Computing, (), 1-26
http://link.springer.com/article/10.1007/s12190-016-1056-1

4). ***Nonpolynomial spline technique for the solution of ninth order boundary Value problem***
Ghazala Akram and Zara Nadeem
Turkish Journal of Mathematics
DOI: 10.3906/mat-1507-112.

5). ***Application of Homotopy Analysis Method to the Solution of Ninth Order Boundary Value Problem in AFTI-F16 Fighters***
Ghazala Akram and Maasoomah Sadaf
Journal of the Association of Arab Universities for Basic and Applied Sciences
DOI.org/10.1016/j.jaubas.2016.08.002.

<u>Accepted</u>

1). ***New Traveling Wave Exact and Approximate Solutions For the Nonlinear Cahn-Allen Equation: Evolution of a Nonconserved Quantity***
Ghazala Akram and Hira Tariq
Nonlinear Dynamics   doi: 10.1007/s11071-016-3262-7, (2016).

Supervision of Ph.D./ M. Phil. Theses

Ph. D. Produced

1. Hamood ur Rehman *Use of Reproducing Kernel Hilbert Space Functions to Solve Boundary Value Problems*, **2014**.

Ph. D. In progress

1. Miss Hira Tariq

2. Ms. Massomah Sadaf

3. Ms. Fiza Batool

4. Ms. Khalida Bibi

M. Phil. Theses Supervised

1.	Rabia Siddique	Quartic Spline Solution of Third Order Singularly Perturbed Boundary Value Problem	2009
2.	Nadia Amin	Quintic Spline Solutions of Fourth Order Singularly Perturbed Boundary Value Problems	2009
3.	Hamood ur Rehman	Solution of First Order Singularly Perturbed Initial Value Problem in Reproducing Kernel Hilbert Space	2010
4.	Afia Naheed	Septic Spline Solution of Two-Point Fourth Order Singularly Perturbed Boundary Value Problem	2010
5.	Imran Talib	Quartic Non Polynomial Spline Solution of Third Order Singularly Perturbed Boundary Value Problem	2010
6.	Ammara Kanwal	Solutions of Fifth Order Singularly Perturbed Boundary Value Problems Using Non- Polynomial Spline Technique	2011
7.	Irfan Ahmad Aslam	Solution of Fourth Order Three-Point Boundary value Problem using Adomian Decomposition Method and Reproducing Kernel Method	2012
8.	Muhammad Tehseen	Solution of Third Order Three-Point Boundary Value Problem in Reproducing Kernel Hilbert Space	2012
9.	Zara Nadeem	Non-Polynomial spline Technique for the Solution of Ninth Order Boundary Value Problem	2015
10.	Muhammad Imran Naeem	Solution of the System of Fifth Order Boundary Value Problem using Quartic Spline	2015
11.	Miss Fareeha Anjum	Existence and Uniqueness of Solution of Fractional Differential Equation of Order $2 < \alpha < 3$ with Two Point and Nonlocal Multi-Point Integral Boundary Conditions	2016
12.	Miss Barrira Jurrat	Existence and Uniqueness of Three point and Four Point Boundary Value Problem of Fractional	2016

		Differential Equations	
13.	Miss Rida Rasheed	A Class of Fixed Point Theorems for the Analysis of Existence and Uniqueness of Fractional Boundary Value Problems involving Nonperiodic, Periodic and Non-Local Boundary Conditions	2016

M. Phil. Students In progress

1. Miss Ayesha Khan
2. Miss Razia Ayyaz
3. Miss Ayesha Riaz
4. Miss Nageela Anum

Refereeing

- Acta Mathematica Scientia
- Applied Mathematics and Computation
- Applied Mathematical Letters
- International Journal of Applied Science and Engineering
- British Journal of Mathematics & Computer Science
- Mathematical Sciences
- International Journal of the Physical Sciences
- Applied Mathematical Modeling
- Numerical Algorithms
- International Journal of Computational Methods
- Applied Numerical Mathematics
- Journal of the Association of Arab Universities for Basic and Applied Sciences

Workshops and Seminars (Presented/Attended)

1. **IEEE-INMIC 2001** held at Lahore University of Management Sciences, Lahore. Dec. 28-30, 2001
2. **Workshop and Colloquium on Mathematics** held at Government College, Lahore. June 24-28,2002
3. **Seminar on Computational Mathematics** held at Institute of Leadership and Management, Lahore. Aug. 5, 2002
4. **LUMS Mathematics Day** held at Lahore University of Management Sciences, Lahore. 3rd July, 2003
5. **World Conference on 21st Century Mathematics – 2004** at School of Mathematical Sciences, Govt. College University Lahore. Mar. 18–20, 2004.
6. **One Day Symposium on Mathematics** at National Centre for Mathematics, GC University, Lahore Nov. 27, 2004
7. **Winter Conference in Mathematics-2004** at Centre for Advanced Studies in Mathematics, LUMS, Lahore. Dec. 3-4, 2004
8. **One Day Seminar on Mathematics** at COMSATS, Lahore. December 6, 2004.
9. **Second World Conference on 21st Century Mathematics, 2005** at School of Mathematical Sciences, GC University, Lahore, Mar. 4-6, 2005
10. **LUMS International Conference on Mathematics and its Applications in Information Technology** at LUMS, Lahore Nov 27-30, 2005

11. **International Conference on Mathematics and its Applications,** at COMSATS, Lahore, Jan. 20-22, 2006
12. **Summer Conference in Mathematics** at Lahore University of Management Sciences, Lahore, July 29-30, 2006
13. **3rd International Conference on 21st Century Mathematics, 2007** at School of Mathematical Sciences, GC University, Lahore, Mar 4-7, 2007
14. **Dr. Ghazala Akram** attended **Winter Conference in Mathematics-2008** held at Lahore University of Management Sciences Lahore, Dec. 20-21, 2008
15. **Dr. Ghazala Akram** attended **Summer Conference in Mathematics-2008** organized by Centre for Advanced Studies in Mathematics, Lahore University of Management Sciences Lahore, July 28-29, 2008
16. **Dr. Ghazala Akram** attended **Lecture Series on Black Holes** held at Department of Mathematics, University of the Punjab on Oct 10-11, 2008
17. **Dr. Ghazala Akram** attended **Summer Conference in Mathematics-2009** held at Lahore University of Management Sciences, Lahore, July 27-28, 2009
18. **Dr. Ghazala Akram** attended **Winter Conference in Mathematics-2010** held at Lahore University of Management Sciences Lahore, Jan.11-12, 2010
19. **Dr. Ghazala Akram** attended **Conference on General Relativity and Gravitation** held at Department of Mathematics, **University of the Punjab Lahore** on 11-13 Feb. 2010
20. **Dr. Ghazala Akram** attended **Summer Conference in Mathematics-2010** organized by Centre for Advanced Studies in Mathematics, **Lahore University of Management Sciences Lahore**, July 26-27, 2010
21. **Dr. Ghazala Akram** attended **5th World Conference on 21st Century Mathematics 2011** held at Abdus Salam School of Mathematical Sciences, **GC University, Lahore**, Feb. 9-13, 2011
22. **Dr. Ghazala Akram** attended **One Day Conference on Gravitation** held at Department of Mathematics, **University of the Punjab Lahore** on Dec. 17, 2011
23. **Dr. Ghazala Akram** attended seminar titled **A Large Deviation Approach to Computing Rara Transitions in Multistable Stochastic Turbulence Flows** of Alexander Balanov at School of Mathematical Sciences Queen Mary, University of London, England on Oct. 16, 2012
24. **Dr. Ghazala Akram** attended seminar titled **Annihilating Brownian Motions in One Dimension and Ginibre Ensemble of Random Matrices** of Oleg Zaboronski at School of Mathematical Sciences Queen Mary, University of London, England on Oct. 23, 2012
25. **Dr. Ghazala Akram** attended **Lecture Series on Cosmology** at Department of Mathematics on Nov. 8-9, 2013
26. **Dr. Ghazala Akram** attended **International Conferecne on Relativistic Astrophysics** at Department of Mathematics on Feb. 10-14, 2015
27. **Dr. Ghazala Akram** delivered a talk in International Conference on Recent Advances in Applied Mathematics, held at COMSATS Institute of Information technology, Department of Mathematics, Lahore Campus. Dec. 17-18, 2015
28. 1st UMT International Conference in Pure and Applied Science 2016(1st UICPAS 2016) held on March 5-7, 2016
29. One Day conference on Gravitation and Cosmology in the honour of Prof. Dr. Asgher Qadir held at Department of Mathematics University of the Punjab, Lahore on Nov. 26, 2016.