

Professor Liaqat Ali Khan (CV & Publications)

Personal data:

Name: Liaqat Ali Khan

Date & Place of Birth: July 29, 1947 (Jhelum, Pakistan)

Nationality: Pakistani

Present Address: Department of Mathematics, Faculty of Science,
King Abdulaziz University, P.O.Box 80203,
Jeddah-21589, SAUDI ARABIA

E-Mail: akliqat@gmail.com ; lkhan@kau.edu.sa

URL: <http://lkhan.kau.edu.sa> ; <http://liaqat.itsmybox.co.uk/>

Former Affiliation: Department of Mathematics, Quaid-i-Azam University, Islamabad, PAKISTAN (1977-1981 & 1988-1996).

Permanent address: House No. 468, Street No. 74, G-8-1, Islamabad.

Education:

1. B.A. (1964-66) Mathematics Punjab University, Lahore

1. M.A. (1966-68) Mathematics Punjab University, Lahore

3. Ph.D. (1974-77) Mathematics Wales University, Aberystwyth, U.K.

Ph.D. Thesis: "The Strict Topology and its Generalizations" (1977)
(supervised by Dr. K. Rowlands, Wales University, Aberystwyth, U.K.)

Fields of Research: Functional Analysis, Topology, Fixed Point theory

- (1) Spaces of continuous vector-valued functions (with various linear topologies);
- (2) Stone-Weierstrass and Arzela-Ascoli type theorems;
- (3) Vector-valued measures and integration; Riesz representation theorems;
- (4) Fixed point theorems and Best Approximation;
- (5) General strict topology on topological algebras and modules;
- (6) Multipliers and Quasi-multipliers on topological algebras and modules;
- (7) Differentiation and Mean Value Theorems in TVSs;
- (8) Almost periodicity of functions with values in a TVS.

Courses Taught: (B.Sc./M.Sc./M.Phil./Ph.D. Levels)

- (1) Calculus and Analytic Geometry, Engineering Mathematics, Differential Equations; Linear Algebra, Abstract Algebra
- (2) Real Analysis, Complex Analysis,
- (3) General Topology
- (4) Measure and Integration Theory
- (5) Functional Analysis, Topological Vector Spaces, Ordered Topological Vector Spaces, Non-Archimedean Functional Analysis.
- (6) Banach and Topological Algebras
- (7) Special Topics: Fixed Point Theory, Best Approximation Theory

Teaching Positions:

1968-1971: Lecturer Municipal College, Pattoki
 1971-1973: Lecturer Federal Government College, Islamabad
 (1974-1977: Ph. D. student Wales University, Aberystwyth, U. K.)
 1977-1981: (i) Lecturer Federal Government College, Islamabad
 (ii) Visiting Lecturer Quaid-i-Azam University, Islamabad
 1981-1986: Assistant Professor Garyounis University, Benghazi
 1986-1988: Assistant Professor Federal Government College, Islamabad
 1988-1991: Assistant Professor Quaid-i-Azam University, Islamabad
 1991-1996: Associate Professor Quaid-i-Azam University, Islamabad
 1996-2003: Associate Professor King Abdulaziz University, Jeddah
 2003-todate: Professor King Abdulaziz University, Jeddah

Theses Supervised (M. Phil, M.Sc. and Ph.D.):

(I) M. Phil Theses (supervised at QAU, Islamabad)

1. On a class of ordered topological vector spaces (Farhad Ali, 1981).
2. Theory of double centralizer algebras (Akhtar Hussain, 1981).
3. Best approximation in function spaces (Muhammad Ali, 1990)
4. Compact and precompact operators on topological vector spaces (Muhammad Akram, 1991).
5. Fixed point theorems and applications (Muhammad Iqbal, 1991).
6. Locally m-convex and A-convex algebras (Arshad Imam, 1991).
7. Optimization in ordered topological vector spaces (Muhammad Arif, 1991).
8. Metric projections in best approximation theory (Zafar Iqbal, 1993).
9. Approximation in non-archimedean function space (Khalil Ahmad, 1994).
10. Topologies on function spaces (Ali Muhammad, 1996).

11. Fuzzy topological vector spaces (Zafar Hussain, 1996).
12. Vector-valued measures and integration (Mohammad Sagheer, 1997).
13. Weighted approximation in vector-valued function spaces (Khalida Parveen, 1997).
14. Fixed points and best approximation theorems in convex and H-spaces (Fazeelat Sultana, 1998).

(II) M. Sc. Theses (supervised at KAU, Jeddah)

15. Multipliers on commutative Frechet algebras (Areej Al-harbi, KAU, 2003).
16. Multipliers and Arens product in topological algebras (Maha Saeed, KAU, 2003).
17. Derivations on Banach and Topological algebras (Abeer Badgaish, KAU, 2003).
18. Stone-Weierstrass type theorems for non-archimedean vector-valued function spaces (Lujain Abulhamayel, KAU, 2006).
19. Continuity of algebra homomorphisms on topological algebras (Enaam Alidaroos, KAU, 2006).
20. Non-archimedean Approximation in Weighted Spaces of Continuous Vector-valued Functions (Amer Hassan Al-bargi, KAU, 2007).
21. Best Approximation in Non-archimedean Vector-valued Function Spaces (Khayriah Awad Al-ahmri, KAU, 2008).
22. Topological Modules of Multipliers (Muneerah Omar Al-ansari, KAU, 2010).
23. Quasi-multipliers on A^* -algebras (Sultan Usman Al-Ghamdi, KAU, 2012).
24. Various Properties of Spaces of Continuous and Bounded Functions (Asma Thabit Al-Hamidi, KAU, 2012).
25. Convex Metric Spaces and their Applications to Nonlinear Analysis (Riham Alattas, KAU, 2013).

(III) Ph.D Theses co-supervised:

1. Random Fixed Points and Approximations (Naseer Shahzad, Quaid-i-Azam University (QAU), Islamabad, 1995).
2. Some Types of Best Approximations and their Applications (Nawab Hussain, Bahauddin Zakaria University (BZU), Multan, 2002).

Monograph/Book published:

1. L.A. Khan; "Linear Topological Spaces of Continuous Vector-valued Functions" (Academic Publications, 2013; 350 pages); DOI: 10.12732/acadpubl.201301; <http://acadpubl.eu/monographs/201301/index.html>

Research Publications (L.A. Khan)

1. L.A. Khan, The strict dual of $C(X, E_n)$, Punjab Univ. J. Math. (Lahore) 10/11(1978), 41-46. (MR 82g: 46056)
2. L.A. Khan, The strict topology on a space of vector-valued functions, Proc. Edinburgh Math. Soc. 22(1) (1979), 35-41. (MR 80f: 46042)
3. L.A. Khan, On the Stone-Weierstrass theorem for vector-valued functions, Punjab Univ. J. Math. (Lahore) 12/13(1980), 11-14. (MR 84a: 46082)
4. L.A. Khan and K. Rowlands: On the representation of strictly continuous linear functionals, Proc. Edinburgh Math. Soc. 24(1981), 123-130. (MR 83b: 46050)
5. L.A. Khan, Characterizations of maximal closed submodules in vector-valued function spaces, Kobe J. Math. 1(1984), 153-156. (MR 87h: 46067)
6. L.A. Khan, Separability in the uniform topology, Studia Sci. Math. Hungarica 20(1985), 407-409. (MR 88g: 46055)
7. L.A. Khan, Weighted topology in the non-locally convex setting, Matematicki Vesnik 37(1985), 189-195. (MR 87k: 46081)
8. L.A. Khan, The countable-open topology in the locally convex setting, Kobe J. Math. 3(1986), 47-50. (MR 87k: 46052)
9. L.A. Khan, On the convergence of Mann iterates to a common fixed point of two mappings, J. Pure and Applied Sci., 5(1986), 57-58.
10. L.A. Khan, A characterizations of strictly closed ideals in vector-valued function algebras, Math. Japonica 31(1986), 45-49. (MR 87f: 46082)
11. L.A. Khan, Separability in function spaces, J. Math. Anal. Appl. 113(1986), 88-92. (MR 87f: 46061)
12. L.A. Khan, On approximation in weighted spaces of continuous vector-valued functions, Glasgow Math. J. 29(1987), 65-68. (MR 88c: 41056)
13. L.A. Khan, On a fixed point theorem for iterates in locally convex spaces, J. Natural Sciences and Mathematics 27(1)(1987), 1-5. (MR 88g: 47111)
14. L.A. Khan, Mackey space problem for double centralizer algebras, Punjab Univ. J. Math. 20(1987), 7-12. (MR 89f: 46109)

15. L.A. Khan, Fixed point theorems for Mann iterates in metrizable linear topological spaces, *Math. Japonica* 33(2)(1988), 247-251. (MR 89g: 47079)
16. L.A. Khan, On seminorm separability for vector-valued function spaces, *Studia Sci. Math. Hungarica* 24(1989), 43-45. (MR 89m: 46073)
17. L.A. Khan, Fixed points by Ishikawaa iterates in metric linear spaces, *Math. Reports Toyama Univ.* 12(1989), 57-63. (MR 90j: 47075)
18. L.A. Khan, Some fixed point theorems for involutory mappings in complete metrizable linear topological spaces, *J. Natural Sciences and Mathematics*, 30(1990), 45-50.
19. L.A. Khan, Common fixed point results by iterations using linear mappings, *J. Pure and Applied Sci.*, 39(1990), 43-45.
20. L.A. Khan, Extensions of some fixed point theorems of Kannan and Wong to paranormed spaces, *Punjab Univ. J. Math.* 323(1990), 77-82. (MR 92e: 47106)
21. L.A. Khan and K. Rowlands: The σ -compact-open topology and its relatives on a space of vector-valued functions, *Boll. Unione Mat. Italiana* (7) 5-B (1991), 727-739. (MR 92k: 46057).
22. L.A. Khan, On the Stone-Weierstrass theorem for scalar and vector-valued functions, ICTP (Trieste, Italy), Preprint No:IC/91/257 (1991), 1-5.
23. L.A. Khan, Theory of fuzzy sets and its applications, Proc. Second Regional Conf. on Applications of Mathematics (UNESCO), Islamia University, Bahawalpur (Jan. 10-14, 1992), pp.1-27
24. L.A. Khan, Seminorm separability in function spaces, *Math. Japonica* 37 (1992), 687-689. (MR 93f: 46053)
25. L.A. Khan, Common fixed point results for iterations in metric linear spaces, *Studia Sci. Math. Hungarica*, 27(1992), 143-146.(MR 94d:47H10)
26. L.A. Khan, Integration of vector-valued continuous functions and the Riesz representation theorem, *Studia Sci. Math. Hungarica* 28(1993), 71-77. (MR 94k: 46071)
27. L.A. Khan, Multiplication operators on weighted spaces in the non-locally convex setting, Abstracts, International Congress of Mathematicians, Zurich, 3-11 August 1994, page 70.
28. L.A. Khan, Metrization and separation axioms for finite topological spaces, (Classroom Note),*Int. J. Math. Edu. in Science and Technology*(U.K) 25(1994), 473-474.
29. L.A. Khan, Riesz representation theorem for the dual of a space of vector-valued functions, *Boll. Unione Mat. Italiana* (7) 8-A (1994), 391-396. (MR 95k: 46055)
30. L.A. Khan, Some approximation results for the compact-open topology, *Periodica Math. Hungarica* 30(1995), 81-86. (MR 96b: 46056)

31. L.A. Khan and A.R. Khan: An extension of Brosowski-Meinardus theorem on invariant approximation, *Approximation Theory and its Applications* 11(4) (Dec. 1995), 1-5. (MR 97h: 41065)
32. K. Morishita and L.A. Khan: The minimum support for a functional on $Cb(X)$, *Topology and its Applications* 73(1996), 285-294. (MR 97j: 54017)
33. L.A. Khan and A.B. Thaheem: On automorphisms of prime rings with involution, *Demonstratio Math.* 30(1997), 307-311.
34. L.A. Khan and A.B. Thaheem: Multiplication operators on weighted spaces in the non-locally convex framework, *Internat. J. Math. & Math. Sci.* 20(1997), 75-80. (MR 98b: 47042)

Publications during work at KAU, Jeddah (1997-present)

35. L.A. Khan, Mean value theorem in topological vector spaces, *C. R. Math. Rep. Acad. Sci. Canada* 19(1997), 24-27. (MR 98k: 58023)
36. L.A. Khan, N. Mohammad and A.B. Thaheem: Double multipliers on topological algebras, *Internat. J. Math. & Math. Sci.* 22(1999), 629-636. (MR 2000m: 46100).
37. N. Shahzad and L.A. Khan: Random fixed points of 1-set contractive random maps in Frechet spaces, *J. Math. Anal. Appl.* 231(1999), 68-75. (MR 2000b: 47135).
38. N. Shahzad and L.A. Khan: Some random fixed points in Frechet spaces, *New Zealand J. Math.* 28(1999), 107-110. (MR 2000b: 47136).
39. N. Shahzad and L.A. Khan: Random fixed point theorems for multivalued acyclic random maps, *Stochastic Analysis and Applications* 17(5) (1999), 835-840. (MR 2000e: 47100).
40. L.A. Khan, Generalized separability in vector-valued function spaces, *Annales Univ. Sci. Budapst.* 42(1999), 3-8. (MR 2001f: 54018)
41. L.A. Khan, H.A.S. Abujabal and M.A. Alghamdi: On the Riesz representation theorem in topological vector spaces *Studia Sci. Math. Hungarica*, 36(2000), 347-352. (MR 2001k: 46058).
42. A.R. Khan and N. Hussain, L.A. Khan: A note on Kakutani type fixed point theorem, *Internat. J. Math. & Math. Sci.*, 24(2000), 231-235. (MR 2003g: 46053)
43. L.A. Khan, A note on the Stone-Weierstrass theorem, *Internat. J. Math. Game Theory and Algebra* 10(2000), 325-326. (MR 2001d: 46079)
44. L.A. Khan and A.B. Thaheem, On the equivalence of the Heine-Borel theorem and the Bolzano-Weierstrass Theorem, *Int. J. Math. Edu. in Science and Technology (U.K)* 31(2001), 620-622. (MR 1-777-775)

45. N. Mohammad, L.A. Khan and A.B. Thaheem: On the closed range multipliers on topological algebras, *Scientiae Math. Japonica*, 53(2001), 89-96. (MR 2003g:46053)
46. L.A. Khan, Random fixed point theorems for composites of acyclic multifunctions, *Stochastic Analysis Appl.*, 19(2001), 925-930. (MR 2002h: 47086)
47. L.A. Khan and A. Latif: Some results on common fixed points and best approximation in p-normed spaces, *Demonstratio Math.* 34(2001), (MR 2002i: 47074)
48. N. Mohammad, L.A. Khan and A.B. Thaheem: Inner derivations on locally C^* -algebras, *Far East J. Math.*, Special Volume (2001), Part I (Functional Analysis and its Applications), 101-108. (MR 2002c: 46018)
49. L.A. Khan and A.B. Thaheem: Operator-valued multiplication operators on weighted function spaces, *Demonstratio Math.* 35(2002), 599-605. (MR 2003e: 47058)
50. L.A. Khan (with A.O. Badghaish and M.M. Saeed): Automatic continuity of multipliers and derivations, (Survey), *Proc. 4th International Pure Math. Conf. (Islamabad, 2003)*, 36-65.
51. L.A. Khan, Trans-separability in spaces of continuous vector-valued functions, *Demonstratio Math.* 37(2004), 611-617. (MR 2005g: 46074)
52. L.A. Khan (with N. Mohammad and A.B. Thaheem): The strict topology on topological algebras, *Demonstratio Math* 38(2005), 883-894. (MR 2006m:46061)
53. L.A. Khan and L. Oubbi: Arzela -Ascoli theorem for non-locally convex weighted function spaces, *Revista Real Academia de Ciencias (Spain)* (2) 60 (2005), 107-115. (MR 2006k:46055)
54. L.A. Khan, Some generalizations of the mean value theorem to topological vector spaces, *Proc. 6th International Pure Math. Conf. (Islamabad, 2005)*, pp. 1-10.
55. L.A. Khan, The general strict topology on topological modules, *Contemporary Math.* 435(2007), 253-263. MR2359434 (2009a:46086)
56. L.A. Khan, Topological modules of continuous homomorphisms, *J. Math. Anal. Appl.* 343(2008), 141-150. (MR2409463; 2009a:46087)
57. L.A. Khan, Trans-separability in the strict and compact-open topologies, *Bull. Korean Math. Soc.* 45(2008), 681-687. (MR2463144 (2009j:46089)
58. L.A. Khan, Saud M. Alsulami and Hamed H. Alsulami, Multiplication operators on non-locally convex weighted function spaces, *Acta Universitatis Apulensis (Mathematics and Informatics)*, 18(2009), 35-50. (MR2554314 (2010h:47048)
59. L.A. Khan, Hamed H. Alsulami and Saud M. Alsulami, On precompact multiplication operators on weighted function spaces, *Acta Universitatis Apulensis (Mathematics and Informatics)*, 19(2009), 125-137. (MR2629797 (2011i:47041)

60. A.K. Katsaras, L.A. Khan and A.R. Khan, On maximal closed ideals in topological algebras of continuous vector-valued functions over non-Archimedean valued fields, *Contemporary Math. (AMS)* 551(2011), 135-141. (MR2882394)
61. Marjan Adib, A.H. Riazi and Liaqat Ali Khan, Quasi-multipliers on F-algebras, *Abstract and Applied Analysis*, Volume 2011, Article ID 235273, 30 pages. MR2784382 (2012d:46111)
62. A.K. Katsaras, L.A. Khan and Hamed H. Alsulami, On the weighted function space $CVo(X,E)$ in the non-Archimedean setting, *Indag. Math.* 23(2012), 571-588. MR2948645
63. L.A. Khan and Asma T. Al-Hamidi, On a Stone-Weierstrass type theorem for $C(X)$, *Internat. J. Pure and Applied Math.* 80(3) (2012), 357-361.
64. L.A. Khan and Saud M. Alsulami, Almost periodicity in linear topological spaces - Revisited, *Commun. Math. Anal.* 13 (2012), 54-63. (MR2998347)
65. L.A. Khan and Saud M. Alsulami, Asymptotic Almost Periodic Functions with Range in a Topological Vector Space, *Journal of Function Spaces and Applications*, Volume 2013 (2013), Article ID 965746, 7 pages. (MR3125099)
66. L.A. Khan and Saud M. Alsulami, Weakly almost periodic functions in linear topological spaces, *African Diaspora J. Math.* 15(2013), 76-86. (MR3161668)
67. L.A. Khan and Saud M. Alsulami, Multipliers of commutative F-algebras of continuous vector-valued functions, *Bull. Malays. Math. Sci. Soc.* 38(1) (2015), 345-358. (MR3394058 - 43A22 (47B48))
68. L.A. Khan and Saud M. Alsulami, Multipliers of Modules of Continuous Vector-Valued Functions. *Abstr. Appl. Anal.* 2014, Art. ID 397376, 6 pp. (MR3212422 - 46J10)
69. Shahin Fathollah and Nawab Hussain and **Liaqat A. Khan**, Fixed point results for modified weak and rational $\alpha - \psi$ -contractions in ordered 2-metric spaces, *Fixed Point Theory and Applications* 2014, 2014:6, 25 pages.(MR3213154 - 54H25)
70. L.A. Khan (with Sumitra Dalal, Ibtisam Masmali and Stojan Radenovic), Some Remarks on Multidimensional Fixed Point Theorems in Partially Ordered Metric Spaces, *Journal of Advances in Mathematics* 7(1)(2014), 1084-1094.
71. L.A. Khan (with Renu Chugh and Sumitra Dalal), Results on n-tupled fixed points in complete ordered metric spaces, *Journal of Advances in Mathematics* 9(1)(2014), 1732-1743.
72. Badryah Alamri, Tomonari Suzuki, **Liaqat Ali Khan**, Caristi's fixed point theorem and Subrahmanyam's fixed point theorem in ν -generalized metric spaces, *Journal of Function Spaces*, ID 709391, 2015, 5 pages. (MR3352136 - 54H25)

73. Tomonari Suzuki, Badryah Alamri, **Liaqat Ali Khan**, Some notes on fixed points in v -generalized metric spaces, Bull. Kyushu Inst. Tech. Pure Appl. Math. 62(2015), 15–23. (MR3383160 - 54H25 (47H10))
74. **L.A. Khan**, What is Mathematics - an Overview, International Journal of Mathematics and Computational Science, 1(3) (2015), 98-101.
75. Muhammad Usman Ali, Tayyab Kamran and **Liaqat Ali Khan**, A new type of multivalued contraction in partial Hausdorff metric spaces endowed with a graph. J. Inequal. Appl. 2015, 2015:205. (MR3357730 - 47H09 (54H25))
76. Weiping Guo, Afrah A.N. Abdou, **Liaqat A. Khan**, Yeol Je Cho, Strong Convergence Theorems for Asymptotically Nonexpansive Nonself-mappings with Applications, Fixed Point Theory and Applications (2015) 2015:212, pp.12 . (MR3425414)

Research Awards:

1. Awarded by the National Book Council (Ministry of Education of Pakistan) under the scheme “Incentive for publication of Articles in International Journals” in Mathematics (1990).
2. Awarded by the Deanship of Scientific Research, King Abdulaziz University, Jeddah, for publication of Articles in ISI Journals (2008, 2011, 2012, 2013).

Membership of Mathematical Societies:

1. Punjab Mathematical Society (1977-todate).
2. American Mathematical Society (1984-86, 96-2011)
3. London Mathematical Society (1985-2010).

Professional Services:

1. Incharge, Mathematics Department, Federal Government College, Islamabad (1971-73., 77-81, 86-88).
2. Referee to various journals.
3. Reviewer: American Mathematical Society, Zbl.
4. Seminar Co-ordinator: Quaid-i-Azam University, Islamabad (1992-96).

Co-Author of Text Book:

L.A. Khan (with S. Ibrar Hussain and others): "Business Mathematics and Statistics", (published as a text-book for B.A./B.Sc. course by Allama Iqbal Open University, Islamabad, 1982).

Participation in Mathematical Conferences / Seminars:

1. British Mathematical Colloquium, University of Newcastle-upon-Tyne, 1975.

2. Gregynog Symposium, University of Wales, 1975.
3. British Mathematical Colloquium, University of Wales, Aberystwyth, 1976.
4. All Pakistan Math. Conference, University of Punjab, Lahore, 1977.
5. All Pakistan Math. Conference, University of Karachi, Karachi, 1978.
6. Seminars held at Quaid-i-Azam University, Islamabad, 1986-1996.
7. Workshop on Recent Developments in Mathematics and Computer Science, ICTP, Trieste, Italy, May - June, 1990.
8. Visiting Mathematician, ICTP, Trieste, Italy, June - Sept. 1991).
9. Second Regional Workshop on Applications of Mathematics (Under UNESCO), Islamia University, Bahawalpur (Jan. 10-14, 1992).
10. Visiting Associate, ICTP, Trieste, Italy (June-August, 1994).
11. All Pakistan Math. Conference, Engineering University, Lahore (March 11-13, 1995).
12. International Pure Mathematical Conference (IPMC, held Annually), Islamabad, Pakistan: I(2000), II(2001), III(2002), IV(2003), V(2004), VI(2005).
13. International Conference on Theory, Methods and Applications of Nonlinear Equations, Texas A&M University, Kingsville (USA, Dec 17-21, 2012)