Scholarship of Leon M. Hall

Publications

1. Differential inequalities and boundary value problems for functional differential equations (with L.J. Grimm), in *Symposium on Ordinary Differential Equations*, Springer-Verlag Lecture Notes in Mathematics 312(1973), W.A. Harris, Jr. and Y. Sibuya, eds., 41-53.
2. Holomorphic solutions of functional differential systems near a singular point (with L.J. Grimm), *Proc. Amer. Math. Soc.*, 42(1974), 167-170.
3. Holomorphic solutions of singular functional differential systems (with L.J. Grimm), *J. Math. Anal. Appl.*, 50(1974), 627-638.
4. An alternative theorem for singular differential systems (with L.J. Grimm), *J. Diff. Equations*, 18(1975), 411-422.
5. Applications of an alternative theorem for singular differential systems, *International Conference on Differential Equations*, Academic Press, New York, 1975.
6. Extensions of Lettenmeyer's Theorem (with L.J. Grimm), *Topics on Differential Equations*, Colloquia Mathematica Societatis Janos Bolyai, 13 Vol.
7. A characterization of the cokernel of a singular Fredholm differential operator, *J. Diff. Equations*, 24(1977), 1-7.
8. Regular singular differential equations whose conjugate equation has polynomial solutions, *SIAM J. Math. Anal.*, 8(1977), 778-784.
9. Solvability of nonhomogeneous singular differential equations (with L.J. Grimm), *Mathematica Balkanica*, 6(1976), 70-74.
10. Singular point theory and a class of complex functional differential equations (with L.J. Grimm and W.J. Fitzpatrick), in *Trudy IV Vsesojuzn. Konf. po Teorii i Priloz. Diff. Urav. Otklon. Arg. Kiev*, (1977), 102-113.
11. The conjugate of a singular functional differential operator, *Internat. J. Math. & Math. Sci.*, 1(1978), 41-45.
12. The number of analytic solutions of a singular differential system, *J. Diff. Equations*, 32(1979), 274-284.
13. Singular differential systems-how many solutions, in *Differential and Integral Equations*, Proceedings of the Seventh Midwest Conference, L.J. Grimm, O.R. Plummer and S.Y. Trimble eds., University of Missouri-Rolla, 1980, 71-78.
14. Banach spaces of functions analytic in a polydisc, *Internat. J. Math. & Math. Sci.*, 9(1986), 39-46.
15. Analytic solutions of singular Pfaffian systems, in *AMS - CMS, Proceedings of the International Conference on Qualitative Theory of Differential Equations*, Edmonton, Alberta (1986).
16. Solvability criteria for singular systems (with L.J. Grimm), in *Functional- Differential Systems and Related Topics IV*, Polish Academy of Science (1986).
17. Asymptotic behavior of solutions of Poincare difference equations (with S. Y. Trimble), in *Proceedings of the International Conference on Theory and Applications of Differential Equations*, Marcel Dekker (1988), 412-416.
18. Third semester calculus and Mathematica, in *Proceedings of the Second Annual Conference on Technology in Collegiate Mathematics*, Addison-Wesley (1991), 188-192.

19. Trochoids, roses and thorns - beyond the Spirograph, *The College Mathematics Journal*, 23(1992), 20-35.
20. Roads and wheels (with Stan Wagon), *Mathematics Magazine*, 65 (1992), 283-302.
21. *Calculus with Analytic Geometry I*, Center for Independent Study, Extension Division, University of Missouri, (Study guide for the University of Missouri Independent Study Calculus I course), 1992.
22. Self adjoint differential equations and Karamata functions, (with L. J. Grimm), in *Proceedings of the Third International Colloquium on Differential Equations*, VSP International Science Publishers, Utrecht (1993), 77-87.
23. Regular variation and solutions of second order differential equations, (with L. J. Grimm), in *Trends and Developments in Ordinary Differential Equations*, World Scientific Publishing Co. Pte. Ltd., Singapore (1994), 97-101.
24. Analytic solutions of Fuchsian differential equations, (with B. D. Haile), in *Invited Lectures delivered at the VII-th Int. Colloquium on Differential Equations*, August 18-23, 1996, Plovdiv, Bulgaria, Volume I, Editor: E. Minchev, Academic Publications (1997), 53-61.
25. An unexpected maximum in a family of rectangles, (with Robert Roe), *Mathematics Magazine* 71 (1998), 285-291.
26. *Calculus with Analytic Geometry I*, (with M.E. Kirgan), Center for Independent Study, Extension Division, University of Missouri, (Revision of the study guide for the University of Missouri Independent Study Calculus I course), 1998.
27. Families of regular solutions of singular systems, (with L.J. Grimm and B.D. Haile), *Journal of Difference Equations and Applications* 7 (2001), 51-62.
28. Oh Calculus, Oh Calculus (with I. H. Morgan), *The American Mathematical Monthly*, 109 (2002), 45.
29. Difference equations and Lettenmeyer's theorem (with W.J. Fitzpatrick and L.J. Grimm), *Journal of Difference Equations and Applications* 8 (2002), 1053-1060.
30. A dozen minima for a parabola, *The College Mathematics Journal* 34, (2003), 139-141.
31. Solids in R^n whose area is the derivative of the volume (with Michael Dorff), *The College Mathematics Journal* 34, (2003), 350-358.
32. Polynomial and series solutions of dynamic equations on time scales (with B. D. Haile), *Dynamic Systems and Applications* 12(1-2), (2003), 149-158.
33. Quasilinearization for the periodic boundary value problem for hybrid differential equations (with S. G. Hristova), *Central European Journal of Mathematics*, 2 (2), (2004), 250-259.
34. A forgotten nineteenth century mathematics journal, *Missouri Journal of Mathematical Sciences*, Vol. 16, No. 3, (2004), 159-167.
35. History of the Missouri Section of the Mathematical Association of America, *The Electronic Proceedings of the Missouri MAA* http://www.missouriwestern.edu/orgs/momaa/ (non-refereed), (2006)
36. Missouri Section of the Mathematical Association of America: Centennial History 1915-2015, submitted to MAA (2014) (greatly expanded version of [35])

Other Writing

1. *Notes on the Great Theorems*, Text for General Honors Seminar on The Great Theorems in Mathematics, Department of Mathematics and Statistics, University of Missouri-Rolla, 1987, and UMR Math 381, Great Theorems in Mathematics, 1998-
2. *Special Functions*, Lecture notes for UMR Math 483, Special Functions; available online at http://lmhall.math.umr.edu/SPFNS/spfns.html
3. Governor's Report, *Missouri MAA Newsletter*, Vol. 25 No. 1 and 2, Vol 26 No. 1 and 2, Vol. 27 No. 1 and 2 (July 1, 2003 - June 30, 2006)
4. Comments from the Chair, *UMR Mathematics and Statistics Department Newsletter*, Annually (1998 - present)
5. History of the Missouri Section - The Section Governors, *Missouri MAA Newsletter*, Vol. 27 No. 2 Winter 2006

Electronic and Media Productions

1. Spirograph Mathematics, January 9, 1992. This is one show in the television series Teachers to Teachers, produced by UMR and KCPT-TV, Kansas City, and distributed to public television stations nationwide by SERC, the Satellite Educational Resources Consortium. The series presents current and innovative issues in specific content areas designed to benefit secondary school teachers. For each show, in addition to the live broadcast, a 15 minute videotape and supporting printed material, designed for use in the classroom, is available.
2. What Good is a Square Wheel? January 16, 1992. This is one show in the television series Teachers to Teachers, produced by UMR and KCPT-TV, Kansas City, and distributed to public television stations nationwide by SERC, the Satellite Educational Resources Consortium. The series presents current and innovative issues in specific content areas designed to benefit secondary school teachers. For each show, in addition to the live broadcast, a 15 minute videotape and supporting printed material, designed for use in the classroom, is available.
3. 20,000 Problems Under the Sea Database, July 1998. I volunteered (on behalf of the UMR Mathematics and Statistics Department) space and a dedicated computer so that this database of over 20,000 problems from many sources could be available on the world wide web at http://problems.math.umr.edu. The database itself is maintained by Mr. Mark Bowron.

Published Problem Solutions

1. *Missouri Journal of Mathematical Sciences* Problem 60 [1993, p. 91], solution in Vol. 6 No. 2 (1994), pp.104-108.
2. *Missouri Journal of Mathematical Sciences* Problem 63 [1993, p. 132], solution in Vol. 6 No. 3 (1994), p. 167 and p. 169.
3. *Missouri Journal of Mathematical Sciences* Problem 134, solution and commentary in Vol. 14 No. 3 (2002), pp. 216-217.
4. *Chance* magazine Goodness of Wit Test #8, Employs Magic, November, 2010 (problem posed in April, 2010 issue)