



Faculty Name

Mohamad K. El-Daou

Location

Shuwaikh Campus: Building 20, 2nd Floor, Office: S-15

Phone Number

(+965) 1806611

Email Address

mk.eldaou@paaet.edu.kw

Education

PhD. & DIC	Computational Mathematics, Imperial College of Science, Technology and Medicine, Univ. of London, U.K.	1992
MSc.	Pure Mathematics, Univ. of Leeds, U.K.	1988
BSc.	Pure Mathematics, The Lebanese Univ., Lebanon	1985

Academic Experience

2015 – Present	Professor, CTS (PAAET), Kuwait
2004 – 2015	Associate Professor, CTS (PAAET), Kuwait
1994 – 2004	Assistant Professor, CTS (PAAET), Kuwait
2009 – 2017	Kuwait University, Kuwait (part-time)
2003 – 2008	Gulf Univ. of Science and Technology, Kuwait (part-time)
1992 – 1993	Lecturer, The Lebanese Uni.
1989 – 1991	Instructor, Imperial College, U.K.
1984 – 1985	Lycée de Deyr el-Qamar, El-Shouf, Lebanon

Research Interests

- Spectral Methods for solving differential and integral equations.
- Exponential fitting techniques for Oscillatory functions.
- Perturbation methods and orthogonal polynomials.

Projects and Consultancies

2016 – 2017	Research Project Funded by PAAET: <i>Solution of Stidd Nonlinear Dynamic Systems</i>
2010 – 2011	Research Project Funded by PAAET: <i>Numerical Integration of Nonlinear Differential Equations</i>
2008 – 2011	Research Project Funded by PAAET: <i>Construction of exponentially fitted methods for highly oscillatory differential equation.</i>
2006 – 2008	Research Project Funded by PAAET: <i>Analysis of a class of computational methods for approximating differential equations: Algorithms, stability, and convergence.</i>
1998	Scientific coordinator for EBLA computer training institute.
1996	Scientific coordinator for Kuwait Marines.

Academic and Administrative Activities

- Organizing Committee: International Conference on Mathematics and Systems Science, Aug 14-16, 2013, Beijing, China.
<http://www.engii.org/workshop/mss2013august>
- Organizing Committee: 2014 Computational Mathematics and Applications Conference, Jan 14-16, 2014, Shenzhen, China.
<http://www.engii.org/workshop/CMA2014January>

- Reviewer for the following international Journals:
 - *Applied and Numerical Analysis*, Elsevier, www.elsevier.com
 - *Numerical Algorithms*, Springer, www.springerlink.com
 - *Computers and Mathematics with Applications*, www.elsevier.com
 - *Advances in Applied Mathematics*, Elsevier, www.elsevier.com
 - *Computer Mathematics*, Taylor and Francis, www.tandf.co.uk/journals
 - *Letters of Applied Mathematics*, www.elsevier.com
 - *ANZIAM Journal*. www.austms.org.au/ANZIAM+Journal
- Encyclopedia of Heat and Mass Transfer, CRC Press, contributor.
- Committee of Institutional Effectiveness Evaluation, CTS, Kuwait.
- Committee of Faculty Promotions, CTS, Kuwait.
- Committee of Scientific Research Projects evaluation, CTS, Kuwait.
- Previous member in:
 - Society of Industrial and Applied Mathematics SIAM, Philadelphia.
 - American Mathematical Society AMS, Providence.

Publications

Refereed Research Papers:

1. El-Daou M.K. and Ortiz E.L, A note on accurate estimations of the local truncation error of polynomials methods for differential equations, *Appl. Math. Lett.* 5, 69-7(1992).
2. El-Daou M.K., Namasivayam S. and Ortiz E.L, Differential equations with piecewise approximate coefficients: discrete and continuous error estimations for initial and boundary value problems, *Comput. Math. Appl.* 24, 33-47(1992).
3. El-Daou M.K., Ortiz E.L and Samara H., A unified approach to the tau methods and Chebyshev series expansions techniques, *Comput. Math. Appl.* 25, 73-82(1992).
4. El-Daou M.K. & Ortiz E.L, Error analysis of the tau method: dependence of the error on the degree and on the length of the interval of approximation, *Comput. Math. Appl.* 25, 3345(1993).
5. El-Daou M.K. & Ortiz E.L, A recursive formulation of collocation in terms of canonical polynomials, *Computing* 52, 177-202(1994).
6. El-Daou M.K. & Ortiz E.L, Differential equations with locally perturbed coefficients: High order error estimates for functions and derivative, *Comput. Math. Appl.* 3, 74-84(1996).
7. El-Daou M.K. & Ortiz E.L, On upper bounds for the number of extrema of Chebyshev alternants, *Ann. of Numer. Math* 4, 301-313(1997).
8. El-Daou M.K. & Ortiz E.L, The number of extrema of the error function of a class of methods for differential equations, *Comput. Math. Appl* 33, 69-79 (1997).
9. El-Daou M.K. & Khajah H.G, Iterated solutions of linear operators equations with the tau method, *Math. Comp.* 66, 207-213 (1997).
10. El-Daou M.K. & Ortiz E.L, The uniform convergence of the tau method for singularly perturbed problems, *Appl. Math. Lett.* 10, 91-94 (1997).
11. El-Daou M.K. & Ortiz E.L, The tau method as an analytic tool in the discussion of equivalence results across numerical methods, *Computing* 60(4), 365-376 (1998).

12. El-Daou M.K. & Ortiz E.L, A recursive formulation of Galerkin's method in terms of the tau method: Bounded and Unbounded domains, *Comput. Math. Appl* 35(12), 83-94(1998).
13. El-Daou M.K. & Ortiz E.L, Biorthogonality, permanence and approximation methods for differential equations, *Int. J. Pure & Appl. Math (IJPAM)* 1(1), 51-69(2002).
14. El-Daou M.K., Computable error bounds for coefficients perturbation methods, *Computing* 69, 305-317 (2002).
15. El-Daou M.K. A tau method with perturbed boundary conditions for certain ordinary differential equations, *Numerical Algorithms* 38(1-3), 31-45 (2005).
16. El-Daou M.K. A posteriori error bounds for the approximate solution of 2nd order ODEs by piecewise coefficients perturbations, *J. Comput. & App. Math.* 189, 51-66 (2006).
17. El-Daou M.K. and Ortiz E.L, The weighting subspaces of the tau method and orthogonal collocation, *J. Math. Anal. & Appl.*, 326, 622-631, (2007)
18. El-Daou M.K. and Al-Mutawa N.S. Coefficients Perturbation Methods for Higher Order Differential Equations, *Int. J. Comput. Math.*, 86, 1453-1472, (2008)
19. El-Daou M.K. and Al-Matar N.R. An improved Tau method for a class of Sturm-Liouville problems, *App. Math. Computation*, 216, 1923-1937, (2010).
20. El-Daou M.K. Exponentially weighted Legendre-Gauss Tau methods for linear second order differential equations, *Comp. Math. Appls.* 62, 51-64 (2011).
21. El-Daou M.K., Al Enezi S. Sh. and Mekkaoui M. M, Correction of eigenvalues estimated by the Legendre-Gauss Tau Method, *Num. Algo.*, 64, 203-220 (2012).
22. El-Daou M.K. Duality between the generalized canonical polynomials and some special determinants, *Int. J. Appl. Math.*, 25(6), 811-824, (2012).
23. El-Daou M.K. & Al Hamad K. Computation of the canonical polynomials and applications to some optimal control problems, *Num. Algo.*, 61(4), 545-566, (2012).
24. El-Daou M.K., Oscillatory Quadrature based on the Tau method, *J. Math. Res.* 5(3), 5668 (2013).
25. El-Daou M.K., Al-Hamad K.M & Zadeh A.S., Multivariate canonical polynomials in the Tau method with applications to optimal control problems, *J. Math. Res.* 7(3), (2015).
26. El-Daou M.K. & Al-Hamdan, Computable error bounds for a class of boundary value problems: a coefficient perturbation approach, *J. Math. Res.* 8(6), (2016).
27. Mohamad K. El-Daou, Talal H. AlZanki, Nadia S. Al-Mutawa, Quasi-Exactly Solvable Differential Models: A Canonical Polynomials Approach, *American Journal of Computational Mathematics*, *Amer. J. Computat. Math.*, 9(2) (2019).
28. Talal H. AlZanki, Mohamed S. Shaaban, Mohamad K. El-Daou, On the High-Order Quasi Exactly Solvable Differential Equations, *Amer. J. Computat. Math.* 2019, 9(4), 234-250.

Refereed Conference Publications:

1. Effects of Pore Pressure and Two-Phase Flow on Permeability Estimation of Reservoir Rock Society of Petroleum Engineering, Abu Dhabi International Petroleum Exhibition & Conference, November 2016.

2. Integration of Highly Oscillatory Functions using the CP-Method, Proc. of the International Conference on Mathematical Sciences and Statistics, Kuala Lumpur, Malaysia, 2013.
3. Spectral corrections for a class of eigenvalue problems, Proc. of the 6th IMT-GT Conference on Mathematics, Statistics and its Appls ICMSA2010, Kuala Lumpur, Malaysia, 131-143, 2010.
4. An Algorithms for Differential Equations with Oscillatory Solutions, *Proceedings of International Conference of Applied and Engineering Mathematics*, IAENG, 2008.
5. An Analytical Solution of Pressure Transient Test of Incompressible Flow in Reservoir Rock Cores. Paper presented at *Society of Petroleum Engineering (SPE) international conference* held in Bahrain 2006, Authors: N. M. Al-Ajmi (SPE), S. F. Alkafeef (SPE); M. K. El-Daou (CTS) and A.F. Al-Ajmi (KU), 2007.
6. Error enclosure for coefficients perturbation methods applied to boundary value problems, ICNAAM 2005 proceedings, European Society of Computational Methods in Science and Engineering, Editor T. E. Simos, Greece, 164-167, 2005.
7. The Weighting subspaces of collocation and the Tau method, Proceedings of the Cornelius Lanczos International Centenary Conference, organized by SIAM in North Carolina State University, USA, Edited by: J.D. Brown, M. T. Chu, D.C. Ellison, R. Plemmons, 1994.

Other Publications:

- 'Lagrange Interpolation' in Encyclopedia of Heat and Mass Transfer, G.F. Hewitt, Y.V. Polezhaev and G.L. Shires, eds (CRC Press, Florida) 1996.
 - 'Gaussian Elimination' in Encyclopedia of Heat and Mass Transfer, G.F. Hewitt, Y.V. Polezhaev and G.L. Shires, eds (CRC Press, Florida) 1996.
1. International Conference on Advanced Scientific Computing (ICASC 2019), 12-14 September 2019, Sinai, Romania.
 2. International conference on Applied Analysis and Mathematical Modeling ICAAMM 2019, 1013 March 2019, Istanbul, Turkey.
 3. ISAAC 2017, August 14-18, 2017 at Linnaeus University, Växjö, Sweden
 4. *The International Conference on Mathematical Sciences and Statistics*, World Academy of Science, Engineering and Technology, 5-7 Feb., 2013, Kuala Lumpur, Malaysia.
 5. *The 6th IMT-GT Conference on Math., Stat. and its Appls*, , 3-4 Nov., 2010, Malaysia.
 6. *Invited Speaker - Ghent University " Symposium on Procedures for Oscillatory Functions"*. Belgium, 16-18 Jan 2008.
 7. *The 2008 International Conference of Applied and Engineering Mathematics, World Congress of Engineers*, 2-4 July, 2008, Imperial College, University of London, United Kingdom.
 8. *12th International Congress on Computational and Applied Mathematics 2006, ICCAM2006*, Catholic Leuven University, Belgium.





9. *11th International Congress on Computational and Applied Mathematics 2004, ICCAM2004, Catholic Leuven University, Belgium.*

Last Revised: May, 2026

