

C. V.

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**Department of Basic Engineering Sciences**  
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Born July 10, 1978

**Qualifications:**

Qualification	Date	General Specialization	Specific Specialization	Institution	Place
<b>Ph.D.</b>	June 2010	Mathematics	Applied Mathematics	<b>Al-Farabi Kazakh National University</b> , Faculty of Mechanics and Mathematics	<b>Kazakhstan</b>
<b>Master of Science</b>	January 2007	Mathematics	Engineering Mathematics	<b>Cairo University</b> , Faculty of Engineering	<b>Egypt</b>
<b>Bachelor of Science with honor</b>	May 2004	Mathematics	Applied Mathematics	<b>Benha University</b> , Faculty of Science	<b>Egypt</b>
<b>Bachelor of Engineering and Technology</b>	June 2000	Electrical Engineering	Control and Measurements	<b>Benha University</b> , Faculty of Engineering at Benha	<b>Egypt</b>

**Academic Experience:**

Title	Place	Institution	College	Dept.	From M / Y	To M / Y
Professor of Engineering Mathematics	Egypt	Benha University	Faculty of Engineering at Benha	Basic Engineering Sciences	6 / 2024	Till now
Assistant Professor of Engineering Mathematics	Egypt	Benha University	Faculty of Engineering at Benha	Basic Engineering Sciences	9 / 2010	5 / 22024
Assistant Professor of Mathematics	Saudi Arabia	Majmaah University	Faculty of Science	Mathematics	9 / 2013	6 / 2023

Assistant Professor of Mathematics	Egypt	-	Higher Technological Institute at 10 <sup>th</sup> of Ramadan	Basic Sciences, Mathematics	9 / 2010	9 / 2013
Research Student (Ph.D.)	Kazakhstan	Al-Farabi Kazakh National University	Faculty of Mechanics and Mathematics	Computer Mathematics' Modeling	12 / 2007	6 / 2010
Lecturer	Egypt	Benha University	Benha High Institute of Technology	Basic Sciences	9 / 2002	11 / 2007

### Courses that have been taught:

Course Name	Course Level
Numerical Analysis	Bachelor
Probability and statistics	Bachelor
Calculus and Multivariable calculus	Bachelor
Linear Algebra	Bachelor
Ordinary differential equations	Bachelor
Complex Variables and Linear Programming	Bachelor
Differential and integral calculus	Diploma
Multivariable calculus	Diploma
Linear algebra and geometry	Diploma
Abstract algebra	Diploma
Ordinary and partial differential equations	Diploma
Numerical Analysis	Master
Integral equations	Master
Linear algebra	Master

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Google scholar: <https://scholar.google.com/citations?user=7NB66kYAAAAJ&hl>

### Scientific Research:

1. Ahmed A. Gaber, Abdul-Majid Wazwaz, and **Mohamed M. Mousa**, Similarity reductions and new exact solutions for (3+1)-dimensional B–B equation, *Modern Physics Letters B*, (2024), Article ID 2350243.
2. **Mohamed M. Mousa** and F. Alsharari, New application of MOL-PACT for simulating buoyancy convection of a copper-water nanofluid in a square enclosure containing an insulated obstacle, *AIMS Mathematics*, Vol. 7 № 11 (2022), 20292–20312.
3. **Mohamed M. Mousa** and Wen-Xiu Ma, A conservative numerical scheme for capturing interactions of optical solitons in a 2D coupled nonlinear Schrödinger system, *Indian Journal of Physics*, Vol. 9 (2022), 1193–1203
4. **Mohamed M. Mousa**, P. Agarwal, F. Alsharari and S. Momani, Capturing of solitons collisions and reflections in nonlinear Schrödinger type equations by a conservative scheme based on MOL, *Advances in Difference Equations*, (2021), Article No. 346.

5. **Mohamed M. Mousa** and F. Alsharari, A Comparative Numerical Study and Stability Analysis for a Fractional-Order SIR Model of Childhood Diseases, *Mathematics MDPI*, Vol. 9 № 22 (2021), Article ID 2847.
6. **Mohamed M. Mousa** and F. Alsharari, Convergence and error estimation of a new formulation of momotopy perturbation method for classes of nonlinear integral/integro-differential equations, *Mathematics MDPI*, Vol. 9 № 18 (2021), Article ID 2244.
7. **Mohamed M. Mousa**, Mohamed R. Ali and Wen-Xiu Ma, A combined method for simulating MHD convection in square cavities through localized heating by method of line and penalty-artificial compressibility, *Journal of Taibah University for Science*, Vol. 15 № 1 (2021), 208-217.
8. **Mohamed M. Mousa**, MHD free convection in a porous non-uniformly heated triangle cavity equipped with a circular obstacle subjected to various thermal configurations, *Modern Physics Letters B*, (2020), Article ID 2050354.
9. R. Sadat, R. Saleh, M. Kassem, **Mohamed M. Mousa**, Investigation of Lie symmetry and new solutions for highly dimensional non-elastic and elastic interactions between internal waves, *Chaos, Solitons & Fractals*, Vol. 140 (2020), Article ID 110134.
10. **Mohamed M. Mousa** and Wen-Xiu Ma, Efficient modeling of shallow water equations using method of lines and artificial viscosity, *Modern Physics Letters B*, (2020), Article ID 2050051.
11. Wen-Xiu Ma, **Mohamed M. Mousa** and Mohamed R. Ali, Application of a new hybrid method for solving singular fractional Lane–Emden-type equations in astrophysics, *Modern Physics Letters B*, (2020), Article ID 2050049.
12. Mohamed R. Ali, **Mohamed M. Mousa**, and Wen-Xiu Ma, Solution of Nonlinear Volterra Integral Equations with Weakly Singular Kernel by Using the HOBW Method, *Advances in Mathematical Physics*, Vol. (2019), Article ID 1705651.
13. **Mohamed M. Mousa**, Effects of Porosity and Heat Generation on Free Convection in a Porous Trapezoidal Cavity, *Thermal Science*, Vol. 23 № 3B (2019), 1801–1811.
14. **Mohamed M. Mousa**, Efficient numerical scheme based on the method of lines for the shallow water equations, *Journal of Ocean Engineering and Science*, Vol. 3 (2018), 303–309.
15. **Mohamed M. Mousa**, Finite element simulation of a unimolecular thermal decomposition inside a reactor, *Journal of Applied Mathematics and Physics*, Vol. 4 (2016), 328–340.
16. **Mohamed M. Mousa**, Modeling of laminar buoyancy convection in a square cavity containing an obstacle, *Bulletin of the Malaysian mathematical sciences society*, Vol. 39 (2016), 483–498.
17. **Mohamed M. Mousa**, Robust schemes based on the method of lines for shock capturing, *Zeitschrift für Naturforschung A (A Journal of Physical Sciences)*, Vol. 70a № 1 (2015), 47–58.
18. **Mohamed M. Mousa**, Controlled variational iteration method for Bratu equation arising in Electro-spun organic nanofibers elaboration, *British Journal of Mathematics & Computer Science*, Vol. 5 № 4 (2015), 515–524.

19. **Mohamed M. Mousa** and M. Reda, The method of lines and Adomian decomposition for obtaining solitary wave solutions of the KdV equation, *Applied Physics Research*, Vol. 5 № 3 (2013), 43–57.
20. **Mohamed M. Mousa**, Finite Element Investigation of Stationary Natural Convection of Light and Heavy Water in a Vessel Containing Heated Rods, *Zeitschrift für Naturforschung A (A Journal of Physical Sciences)*, Vol. 67a № 6-7 (2012), 421–428.
21. **Mohamed M. Mousa**, A. Kaltayev, and H. Bulut, Extension of the homotopy perturbation method for solving nonlinear differential-difference equations, *Zeitschrift für Naturforschung A (A Journal of Physical Sciences)*, Vol. 65a № 12 (2010), 1060–1064.
22. **Mohamed M. Mousa** and A. Kaltayev, Homotopy perturbation method for solving nonlinear differential-difference equations, *Zeitschrift für Naturforschung A (A Journal of Physical Sciences)*, Vol. 65a № 6/7 (2010), 511–517.
23. **Mohamed M. Mousa** and A. Kaltayev, Application of He's homotopy perturbation method for solving fractional Fokker–Planck equations, *Zeitschrift für Naturforschung A (A Journal of Physical Sciences)*, Vol. 64a № 12 (2009), 788–794.
24. **Mohamed M. Mousa** and A. Kaltayev, Application of the homotopy perturbation method to a magneto-elastico-viscous fluid along a semi-infinite plate, *International J. of Nonlinear Science and Numerical Simulation*, Vol. 10 № 9 (2009), 1113–1120.
25. **Mohamed M. Mousa** and A. Kaltayev, Homotopy perturbation Pade technique for constructing approximate and exact solutions of Boussinesq equations, *Applied Mathematical Sciences*, Vol. 3 № 22 (2009), 1061–1069.
26. **Mohamed M. Mousa**, A. Kaltayev and S. F. Ragab, Investigation of a transition from steady convection to chaos in porous media using piecewise variational iteration method, *World Academy of Science, Engineering and Technology (WASET)*, Vol. 3 № 10 (2009), 869–878.
27. **Mohamed M. Mousa** and A. Kaltayev, A comparison study of a symmetry solution of magneto-elastico-viscous fluid along a semi-infinite plate with homotopy perturbation method and 4<sup>th</sup> order Runge–Kutta method, *World Academy of Science, Engineering and Technology (WASET)*, Vol. 3 № 7 (2009), 484–489.
28. **Mohamed M. Mousa** and A. Kaltayev, Solving Inhomogeneous Wave Equation Cauchy Problems using Homotopy Perturbation Method, *World Academy of Science, Engineering and Technology (WASET)*, Vol. 3 № 7 (2009), 490–493.
29. **Mohamed M. Mousa** and A. Kaltayev, Constructing approximate and exact solutions for Boussinesq equations using homotopy perturbation Pade technique, *World Academy of Science, Engineering and Technology (WASET)*, Vol. 3 № 2 (2009), 99–107.
30. **Mohamed M. Mousa** and S. F. Ragab, Application of homotopy perturbation method to linear and nonlinear Schrödinger equations, *Zeitschrift für Naturforschung A (A Journal of Physical Sciences)*, Vol. 63a № 3/4 (2008), 140–144.

31. **Mohamed M. Mousa**, S. F. Ragab and S. I. Mostafa, New Exact Solutions for Nonlinear Equations by the General Improved Tanh and Sech Methods, *Sci. Bull. Fac. Eng. Ain shams Univ. Egypt*, Vol. 41 № 2 (2006), 859–876.
32. **Mohamed M. Mousa**, S. F. Ragab and S. I. Mostafa, Improved Tanh and Sech Methods Applied to Special Types of Nonlinear Partial Differential Equations, *Sci. Bull. Fac. Eng. Ain shams Univ. Egypt*, Vol. 41 № 1 (2006), 1165–1180.

**Books**

1. **Mohamed M. Mousa**, Modifications of homotopy perturbation & variational iteration methods: Convergence theorems and applications in fluid mechanics and mathematical physics, *LAP LAMBERT Academic Publishing*, (2011), 1165–1180.  
ISBN-13: 978-3846516850
2. **Mohamed M. Mousa**, Improved Tanh and Sech Methods for Obtaining New Exact Solutions: Applied to nonlinear evolution and transmission lines model equations, *LAP LAMBERT Academic Publishing*, (2011), 1165–1180.  
ISBN-13: 978-3845443904

**Areas of Research Interest:**

- Computational Mathematics
- Differential Equations
- Numerical Analysis
- Computational Fluid Dynamics
- Fractional Calculus

**International Scientific Awards:**

- 1- Published biography in **Who’s Who in the World 27<sup>th</sup> Edition 2010** as one of the stars in the field of mathematics.
- 2- Award for the higher impact factor research paper of the university PhD students, Rector of al-Farabi Kazakh National University, Almaty, Kazakhstan, June 2010.

**Languages:**

Language	Proficiency								
	Reading			Writing			Speaking		
	Begin.	Med.	Adv.	Begin	Med.	Adv.	Begin.	Med.	Adv.
Arabic	Mother tongue								
English			*			*			*
Russian		*			*			*	

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