



Mohamed.E.A. Zidan

Assistant Professor

Employment History

Profile

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I hold a Ph.D. in Applied Mathematics from Cape Town University and have been serving as an Assistant Professor of Applied Mathematics at Tabuk University since 2015. My academic journey includes experience as a part-time lecturer at Cape Town University (2013–2014), where I developed a strong foundation in teaching and research.

Beyond my teaching and research, I have actively participated in international scientific schools and presented my work at prestigious conferences worldwide. Additionally, I have taken on leadership roles, including serving as Head of Academic Quality Assurance in the Mathematics Department and leading the curriculum development team for the Master's program in Applied Mathematics at Tabuk University.

My research interests span dynamical systems modeling, perturbation theory, and machine learning, reflecting my commitment to advancing mathematical applications in various scientific domains.

☐ **2015-Present** **Assistant Professor**
University of Tabuk, Saudi Arabia

Responsibilities:

- Teaching undergraduates and postgraduates courses.
- Head of the academic quality assurance committee at the Mathematics Department.

☐ **2013-2014** **Lecturer, Part-time**
University of Cape Town, South Africa

Responsibilities:

- Teaching postgraduate students at the Academic Development Program.

☐ **2011-2014** **Tutor**
University of Cape Town, South Africa

Responsibilities:

- Tutoring various undergraduate courses at the Mathematics, Engineering and Commerce Departments.

Education

- **Ph.D.** in Applied Mathematics at the Department of Mathematics and Applied Mathematics.
University: Cape Town, South Africa.
Thesis title: Topics in Modified Gravity.
Supervisor: Prof. Peter Dunsby.
Date of graduation: June 2013.
- **M.Sc.** in Applied Mathematics at the Department of Mathematics and Applied Mathematics.
University: Cape Town, South Africa.
Thesis title: Cosmological Dynamics of Exponential Gravity.
Supervisor: Prof. Peter Dunsby.
Date of graduation: June 2008.

- **PG.Dip.** in Mathematical Sciences at the African Institute of Mathematical Sciences (AIMS).
University: Cape Town, South Africa.
Class of pass: Second class division one.
Date of graduation: June 2005.
- **B.Sc. Honors** in physics at the Department of Physics.
University: Khartoum, Sudan.
Class of pass: Second class division one.
Date of graduation: September 2001.

Teaching Experience

Undergraduate Teaching:

- Applied Mathematics, University of Tabuk.
- Linear Algebra, University of Tabuk.
- Special Functions, University of Tabuk.
- Differential Geometry, University of Tabuk.
- Discrete Mathematics, University of Tabuk.
- Abstract Algebra 2, University of Tabuk.
- General Topology, University of Tabuk.
- Financial Mathematics, University of Tabuk.
- Basic Mathematics, University of Tabuk.
- An Introduction to Mathematica, University of Tabuk.
- Ordinary Differential Equations, University of Tabuk.
- Calculus I, II, University of Tabuk.
- Partial Differential Equations, University of Tabuk.
- Integral Equations, University of Tabuk.
- Set Theory, University of Tabuk.
- General physics for engineering, University of Khartoum.

Postgraduate Teaching:

- Numerical Solutions of Ordinary Differential Equations for M.Sc. students, at the mathematics department, University of Tabuk (2022).
- Ordinary Differential Equations for M.Sc. students at the mathematics department, University of Tabuk (2022; 2020).

- Applications of partial differential equations for M.Sc. students at the mathematics department, University of Tabuk (2021).
- Perturbation Theory course for M.Sc. Students at the mathematics department, University of Tabuk (2021; 2019).
- General Relativity course at the Academic Development postgraduate Program, University of Cape Town, South Africa (2013; 2014).

Postgraduate projects:

- Integral Equations and their solution methods.

Tutoring:

- Financial Mathematics, University of Cape Town 2014.
- Engineering Statics, University of Cape Town 2013.
- Vector Calculus for Engineers, University of Cape Town 2012.
- Calculus I and II, University of Cape Town 2011.

Professional Qualifications

Sample of Professional Trainings:

- **Preparing Institution for Accreditation workshop**, British Council, Saudi Arabia (19-20 Nov 2017).
- **Securing Academic Standards Through Effective Reporting and Action workshop**, British Council, Saudi Arabia (25-26 Apr 2017).
- **Creating Key Performance Indicators workshop**, University of Tabuk, Saudi Arabia (14 Nov 2017).
- **Program Specification and Program Report workshop**, University of Tabuk, Saudi Arabia (21 Sep 2016).
- **Construction of an Achievement Test**, University of Tabuk, Saudi Arabia (29 Aug 2016).
- **Developing the second strategic plan for Tabuk University workshop**, University of Tabuk, Saudi Arabia (30 Aug 2016).

- **Developing Learning Outcomes**, University of Tabuk, Saudi Arabia (19 Apr 2016).

Positions held:

- **Head of the Academic Quality Assurance and Accreditation Unit** at the Faculty of Science, University of Tabuk (2016-2020).
- **Head of the Academic Quality Assurance Committee** at the Mathematics Department, University of Tabuk, from 2016-present.

Publications Record

Title: Understanding the Dynamic Characteristics of Student Cohort Progression Using Dynamic Mode Decomposition.

Date: 2025.

Under review: Accepted for publication at the Advances and applications in Statistics Journal.

Title: A wavelet time-frequency analysis of pandemic dynamics and impacts - COVID19 case study.

Date: 2024.

Under review: Accepted for publication at the International Journal of Biomathematics (IJB-D).

Title: **Multifractal** Wavelet dynamic mode decomposition diagnosis some marketing time series and economic impact.

Date: 2024.

Under review: Submitted to the International Journal of Biomathematics (IJB).

Title: Forecasting Students Progression rates: A case study at Tabuk University.

Date: 2021.

Published in: : International Journal of Science and Research (IJSR)

Title: Constraining the gravitational action with CMB anisotropies.

Date: 2014.

Published in: arXiv:1412.6350

Title: Cosmological tensor perturbations in theories beyond Λ CDM.

Date: 2013.

Published in: AIP Conference Proceedings,
<https://doi.org/10.1063/1.4791747>

Title: Cosmological dynamics of fourth order gravity: A compact view.

Date: 2012.

Published in: Phys. Rev. D 85, 083511

Title: Covariant gauge-invariant perturbations in multi-fluid $f(R)$ -gravity.

Date: 2012.

Published in: Class.Quant.Grav.29 (2012) 135011

Title: Unifying the study of background dynamics and perturbations in $f(R)$ -gravity.

Date: 2008.

Published in: arXiv:1412.6350

Title: Cosmological dynamics of exponential gravity.

Date: 2008.

Published in: Class.Quant.Grav.25 (2008) 135002

Awards

- **Research Associate Award:** The University of Cape Town, South Africa (2009).
- **Post Graduate Diploma Scholarship:** The African Institute of Mathematical Sciences (AIMS), University of Cape Town, South Africa (2005).

Conferences, Schools and Workshops

Conferences attended

- Mathematical Methods in Systems of Biology and Population Dynamics, African Institute of Mathematical Sciences (AIMS), South Africa (Jan. 2012).
- Beyond the Concordance Model, Stellenbosch Institute for Advanced Studies, South Africa (Aug. 2010).
- String Theory, Gravity and Cosmology, University of Witwatersrand, South Africa (Dec. 2009).

- South African Gravity Society Conference, University of Cape Town, South Africa (Jan. 2008).

Presentations Delivered:

- **Title:** Cosmological dynamics of fourth order gravity: A compact view.
Presented at: The Spanish Relativity Meeting, University of Madrid, Spain (Dec. 2011).
- **Title:** Covariant gauge-invariant perturbations in multifluid $f(R)$ -gravity.
Presented at: The Annual Conference of the South African Institute of Physics, University of Kwazulu Natal, South Africa (Jul. 2009).
- **Title:** Unifying the study of background dynamics and perturbations in $f(R)$ gravity.
Presented at: The South African Gravity Society Conference, University of Kwazulu Natal, South Africa (Apr. 2009).
- **Title:** Cosmological dynamics of exponential gravity.
Presented at: The Department of Mathematics, University of Cape Town, South Africa (Jun. 2008).

Schools and Academic workshops attended:

- TRR-33 Winter School in cosmology, Passo del Tonale, Italy (Dec 2010).
- Correlation Functions and Ads/CFT Correspondence, University of Witwatersrand, South Africa (Apr 2010).
- Summer School in Cosmology, The Abdus Salam International Centre for Theoretical Physics (ICTP), Italy (Aug 2008).
- South African Gravity Society Conference, University of Cape Town, South Africa (Jan 2008).

References

- **Professor. Peter Dunsby**
Department of Mathematics & Applied Mathematics,
University of Cape Town, South Africa.
Tel: +27-2165-02344 **Email:** dunsby@gmail.com
- **Professor. Anouar Ben Mabrouk**
Associate Professor at the Department of Mathematics,
Tabuk University, Saudi Arabia.
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