

## PERSONAL PROFILE



**Victor Folarin PAYNE**

***BS.c., M.Sc., Ph.D.(Ib.)***

**SENIORLECTURER.**

### **AREA OF SPECIALISATION**

**Qualitative Analysis of Nonlinear PDE**

### **CONTACT**

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### **Current (Research) Projects/Activities**

- (a) Investigation of the behaviour of eventually positive solutions of the equation  $\Delta u + f(u) = 0$ . The motivation for this study is in the behaviour for this study is in the behaviour of several mechanical systems.
- (b) Extension of Sturmian Comparison principles to the general class of systems of evolution equations of parabolic and hyperbolic types with or without delays. They arise in the study of harvest, population growth and many ecological problems.
- (c) The study of the asymptotic behaviour of solutions of nonlinear dynamic elasticity

via energy principles.

(d) Investigation of asymptotic stability and differentiability of solutions of integrodifferential equations of visco-elasticity via dual technique of "limiting equation" result and semi-group theory.

(e) Development of numerical algorithms, generalization of results and application of techniques used in the analysis of other non-linear equations earlier studied.

(f) The study of a nonlinear integral equation via fixed point theorem of Krasnoselskii. The problem is a model of vehicular traffic and certain economic principles.

(g) Investigation of a discretization technique for decoupling systems of partial differential equations which arise in quantum mechanics.

(h) Study of properties of the eigenvalues of a 4th order singular boundary value problem.

(i) Investigation of the boundedness and stability of solutions of a system of impulsive hyperbolic differential equations with delays.

(j) The study of the global attractivity and asymptotic stability of solutions of a nonlinear equation of dynamic elasticity.

(k) The investigation of the solutions of a nonlinear problem of population dynamics using semi-group approach.

## **Publication.**

### **Dissertation and Thesis:**

(a) PAYNE, V. F. (1985), "A priori estimates in linear, elliptic partial differential equations", Unpublished M.Sc. Dissertation, Department of Mathematics, University of Nigeria.

(b) PAYNE, V. F. (1992). "Buckling of a thin, elastic rectangular plate with a rectangular hole". Unpublished Ph.D. Thesis, Department of Mathematics, University of Ibadan.

X PUBLICATIONS

### **Books already published:**

(1) PAYNE, V.F. (1995): "Vectors and Tensors", Centre for External Studies. University of Ibadan. 182pp. ISBN 978-021-103-9.

(2) PAYNE, V.F. (1995): "Complex Analysis", Centre for External Studies, University of Ibadan. 166pp. ISBN 978-021-102-0.

(b) Chapters in Books already published: NIL

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### **Articles that have already appeared in Refereed Conference Proceedings:**

\*(3) PAYNE, V.F. (2009): "Lp Solutions of the Quasilinear Differential Equation  $(g(t)u(t))' + h(t)u(t) = 0$ ", Advances in Mathematics, Proceedings of A Memorial Conference in honour of Prof C.O.A. Sowunmi, Dept of Mathematics, University of Ibadan, Nigeria, pp 52-58.

\*(4) PAYNE, V.F. and AJIBOLA, S.A. (2009): "Analytic Solution of Viscous Burgers' Equation by the Decomposition Method," Advances in Mathematics, Proceedings of A Memorial Conference in honour of Prof C.O.A. Sowunmi, Dept of Mathematics, University

of Ibadan, Nigeria, pp 229-233.

**Articles that have already appeared in Learned Journals :**

(5) PAYNE, V.F. (1995): "Behaviour of a class of self-similar solutions of the buckling equation for a rectangular plate with a rectangular hole". Journal of Science Research, University of Ibadan, Vol.(2)[1], pp. 1-7. (Ibadan, Nigeria).

(6) O'HARA, J. and PAYNE, V. F.,(1998): "Construction of Separating Functions for the Quasi-Linear Equation

$\frac{d}{dt} p_{dy}$

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+  $qy = 0$ ", Journal of Applicable Analysis, Vol.

69(1-2), pp. 73-82. (Delaware, USA).

(7) PAYNE, V.F. (2000): "On the Existence of Positive Periodic Solutions of the Equation  $utt = k(u) - u_{xx} + u_{txx} + f(x, t)$ ", Proceedings of the National Mathematical Centre on Ordinary Differential Equation Vol. 1[1], pp. 129-136. (Abuja, Nigeria).

(8) PAYNE, V.F. (2000): "An Existence Result for a Non-Linear Two-point Boundary Value Problem", Journal of Science Research, University of Ibadan, Vol. 6[1] pp. 25-29. (Ibadan, Nigeria).

\*(9) PAYNE, V.F. (2002): "Exchange of Stability of Bifurcating Solutions of a Boundary Value Problem", Journal of the Nigerian Mathematical Society. Vol. 21 pp. 97-105. (Ile-Ife, Nigeria).

\*(10) PAYNE, V.F. (2006): "Existence and Uniqueness of Positive Solutions of a Fourth-Ordinary Boundary Value Problem", Publications of International Centre for Mathematics and Computer Science, Vol. 3. pp. 195-209. (Lagos, Nigeria).

\*(11) PAYNE, V.F. (2007): "Some Existence and Multiplicity Results for Solutions of a Non-Linear Equation of Second Order Defined on a Bounded but Disjoint Domain", Journal of the Nigerian Mathematical Society. Vol. 26, pp. 41-48. (Ile-Ife, Nigeria).

\*(12) PAYNE, V.F. (2009): "Multiple Solutions for Non-linear Eigenvalue Problem", Electronic Journal of Differential Equations and Control Processes, No 4, pp. 42-58. (St Petersburg, Russia).

\*(13) PAYNE, V.F. and EGERE, A. C. (2010): "On Oscillation of Quasilinear Differential Equations", Journal of Mathematical Sciences, Vol. 21, No 4. pp 499-506 (West Bengal, India).

**Books, Chapters in Books and Articles already accepted for Publication**

\*(14) PAYNE, V.F. (2010): "On the Asymptotic Stability of Solutions of An Integro-Differential Equation of Viscoelasticity", Journal of Mathematical Sciences, (accepted in March 16, 2010) (West Bengal, India).

(g) Technical Report and Monographs:

(15) PAYNE, V.F. (1997); "Invariance Group Properties of a Subsystem of the Equation Describing the buckling of a Thin, Elastic, Rectangular Plate Containing a Rectangular Hole", I.C.T.P Trieste, Italy, Internal Report, IC/IR/96/45, pp 1-27.

(16) PAYNE, V.F. (1997); "Buckling of a Thin, Elastic, Rectangular Plate With a Rectangular

Hole: Energy Approach”, I.C.T.P Trieste, Italy, Internal Report, IC/IR/96/46,  
pp 1-19.