



## Faculty Capabilities and Interests

**Name:** Zephyrinus C. Okonkwo, PhD.  
**Email:** Zephyrinus.okonkwo@asurams.edu  
**Discipline:** Mathematics  
**Subdiscipline(s):** Applied Mathematics, Optimal Control  
**Areas of Research** Functional Differential Equations, Stochastic Differential Equations, Discrete Systems, Mathematical Modeling of physical Phenomena, Control of Systems Governed by Differential Equations  
**Interests:**  
**Skills:** Quantitative Theory, Mathematical Modeling  
**Research Summary** Engineering, biological, and economic systems encountered in real applications are stochastic in nature, hence, the rates of change of most dependent variables depend on not only time but on probability. Stochastic models exemplify the nature of the systems, hence appropriate stochastic models give the best approximate solutions to real life problems. The models I have developed can be applied to revenue realization in the informal sector, wealth of nations, and other complex systems. I have also worked in the field of Volterra Equations, a class of functional and functional differential equations in which the present state of the system not only depends on the immediate past but also on the systems' past history. Furthermore, I have worked with colleagues to develop models which play immense role in cyber security by characterizing stochastic security matrices.  
**Keywords (5 maximum)** Differential Equations, Volterra Equations, Stochastic Differential Equations, Control, Stochastic Security Matrices.