MaSS
DST-NRF CENTRE OF EXCELLENCE IN MATHEMATICAL & STATISTICAL SCIENCES

CoE-MaSS weekly seminar series

THE DST-NRF CENTRE OF EXCELLENCE IN MATHEMATICAL AND STATISTICAL SCIENCES (CoE-MaSS) WOULD LIKE TO PRESENT A SEMINAR BY

Dr Peter Mwamtobe

(School of Computer Science and Applied Mathematics, University of the Witwatersrand)

"Mathematical analysis of a lymphatic filariasis model with quarantine and treatment"

Friday, 02 September 2016
10h30-11h30

Broadcast live from:
Videoconferencing Facility, 1st Floor
Mathematical Sciences Building, Wits West Campus

How to connect to this seminar remotely:
You can connect remotely via Vidyo to this research seminar by clicking on this link:
http://wits-vc.tenet.ac.za/flex.html?roomdirect.html&key=y0SSOwFsvsidbzg4qFdWXvvQtyI
and downloading the Vidyo software before the seminar.
You must please join in the virtual venue (called *"CoE Seminar Room (Wits)"* on Vidyo) strictly between **10h00-10h15**. No latecomers will be added.

Important videoconferencing netiquette:
Once the seminar commences, please mute your own microphone so that there is no feedback from your side into the virtual room. During the Q&A slot you can then unmute your microphone if you have a question to ask the speaker.

Title:
Mathematical analysis of a lymphatic filariasis model with quarantine and treatment

Presenter:
Dr Peter Mwamtobe, School of Computer Science and Applied Mathematics, University of the Witwatersrand, peter.mwamtobe@wits.ac.za

Abstract:
Lymphatic filariasis is a globally neglected tropical parasitic disease which affects all ages and leads to an altered lymphatic system and abnormal enlargement of body parts. A mathematical model of lymphatic filariaris with intervention strategies is developed and analyzed. Control of infections is analyzed within the model through medical treatment of infected-acute individuals and quarantine of infected-chronic individuals. We derive the effective reproduction number, R_0, and its interpretation/investigation suggests that treatment contributes to a reduction in lymphatic filariasis cases faster than quarantine. However, this reduction is larger when the two intervention approaches are applied concurrently. Numerical simulations are carried out to monitor the dynamics of the filariasis model sub-populations for various parameter values of the associated reproduction threshold. Lastly, sensitivity analysis on key parameters that drive the disease dynamics is performed in order to identify their relative importance in the filariasis disease transmission and intervention.