

SE&T Colloquium Series-Winter 2013

Speaker	Dr. Jean-Jacques Kengwong-Keumo Department of Mathematical Sciences Cameron University Host: Dr. Emmanuel Ncheuguim
Title	<i>Competition between Two Phytoplankton Species Under the Influence of Allelopathic Effects, Nutrient Recycling, and Predation</i>
Abstract	<p>We consider a mathematical model describing competition between two phytoplankton species for a growth-limiting resource in a homogeneous environment (such as that provided by a chemostat). We allow for the possibility that one of these species is toxin-producing and so has an allelopathic effect on the other, and that both species serve as prey for an herbivorous zooplankton species. We provide conditions for boundedness of solutions, existence and stability of non-negative equilibria. Ecological interpretations of stability inequalities are given. In the absence of phytotoxic interactions and nutrient recycling, we prove that our model exhibits uniform persistence. It is also shown that the incorporation of the effect of nutrient recycling in our model modifies only the critical values of the parameter bounds, leaving the qualitative dynamics unaffected. Numerical simulations are carried out to show consistency with theoretical analysis. The removal rates of species are distinct and we use general uptake functions. Here, allelopathy is defined as the effect of one plant (including micro-organisms) on the growth of another plant through the release of chemical compounds (called allelochemicals) into the environment (Rice, 1984).</p>
Date	Tuesday, March 19
Time	4:10-5:00pm
Place	Pioneer 240
	Refreshments will be served at 4:00pm.