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**Edward J. Allen\*** ([edward.allen@ttu.edu](mailto:edward.allen@ttu.edu)), Department of Mathematics and Statistics, Texas Tech University, Lubbock, TX 79409-1042. *Derivation and Computation of Discrete-Delay and Continuous-Delay SDE Models in Mathematical Biology*. Preliminary report.

Stochastic versions of discrete-delay and continuous-delay differential equations, useful in mathematical biology, are derived from basic principles carefully taking into account the randomness in the processes. In particular, stochastic delay differential equation models are derived and studied for glucose/insulin levels, bacteriophage/bacteria dynamics, and logistic population growth with delay. Numerical methods for approximating the delay SDE models are described. Comparisons between computational solutions of the delay SDEs and independently formulated Monte Carlo calculations support the accuracy of the derivations and of the numerical methods. (Received January 13, 2012)