Lessons Learned from Teaching Advanced Biological Control Systems

1. All the students had BIOE 336 and should have been familiar with Laplace transforms and reaction kinetics. But they still required significant review.
2. The students had very weak knowledge of linear algebra. They knew matrix multiplication, inverses, and how to calculate eigenvalues. But they could not interpret eigenvectors. Also, they did not the know the relationships between the 4 subspaces of matrices, and seemed unfamiliar with change of coordinates.
3. It was effective to restrict to SISO analysis using transfer functions. The key properties of a system are:
   1. Poles – indicates if stable, oscillates
   2. Impulse response / response to initial conditions – indicates if system settles. sG(s), as s->0.
   3. Step response. Indicates controllability. G(s) as s->0.