BMEG 230 – Numerical Methods in Biomedical Engineering

Student Outcome a: an ability to apply knowledge of mathematics, science, and engineering.

Performance Criterion #1: *Apply basic concepts of numerical analysis to biosystems.*

Scoring Rubric:

Aspect	1: Not proficient	2: Progressing to proficiency	3: Proficient	4: Superior proficiency
Use numerical analysis for a problem involving a biosystem	Does not use numerical analysis	Defines type of analysis that can be done, but does not use it	Uses numerical anaylsis but has minor errors	Uses numerical analysis completely correctly

Performance Criterion #2: *Solve linear and nonlinear algebraic equations as applied to biological systems*

Scoring Rubric:

Aspect	1: Not proficient	2: Progressing to proficiency	3: Proficient	4: Superior proficiency
Solve linear algebraic equations	Does not attempt to solve the equation	Can identify the equation needed, but does not solve	Gets to a solution with errors	Solves equation correctly
Solve non-linear algebraic equations	Does not attempt to solve the equation	Can identify the equation needed, but does not solve	Gets to a solution with errors	Solves equation correctly

Performance Criterion #3: *Apply ordinary and partial differential equations in dynamic systems to evaluate biomedical engineering relevant problems*

Scoring Rubric:

Aspect	1: Not proficient	2: Progressing to proficiency	3: Proficient	4: Superior proficiency

Solve ordinary differential equations	Does not attempt to solve the equation	Can identify the equation needed, but does not solve	Gets to a solution with errors	Solves equation correctly
Solve partial differential equations	Does not attempt to solve the equation	Can identify the equation needed, but does not solve	Gets to a solution with errors	Solves equation correctly

Student Outcome k: an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Performance Criterion #1: *Use MATLAB and Excel to solve problems related to applications of engineering in biological systems*

Scoring Rubric:

Aspect	1: Not proficient	2: Progressing to proficiency	3: Proficient	4: Superior proficiency
Use MATLAB to solve problems	Does not use MATLAB	Uses MATLAB incorrectly	Uses basic MATLAB functions correctly	Uses advanced programming in MATLAB to solve problem correctly
Use Excel to solve problems	Does not use Excel	Uses Excel incorrectly	Uses basic Excel functions correctly	Uses advanced programming in Excel to solve problem correctly