COCONINO COMMUNITY COLLEGE
COURSE OUTLINE

A.   Identification:
1.   Subject Area: MATHEMATICS (MAT)
2.   Course Number: 261
3.   Course Title: DIFFERENTIAL EQUATIONS
4.   Credit Hours: 4
5.   Catalog Description: Introduction to ordinary differential equations. Includes first order equations, higher order linear equations, applications of first and second order equations, series solutions, Laplace transforms, and systems of linear differential equations. General Education: Mathematics. Prerequisite: MAT 230. Four lecture. SUN☉ MAT 2261.

B.   Course Goals:
Upon completion of this course, the student will have a broad understanding of the theory of ordinary differential equations, how they may be applied to various problems in engineering, physical and social sciences, and an increased array of problem solving techniques.   This course incorporates projects utilizing the software program MatLab to encourage a better understanding of the material. General Education Curriculum: Mathematics.

C.   Course Outcomes: Students will:
1.   define terminology related to the theory of differential equations;
2.   classify a differential equation according to type, order, and linear or nonlinear;
3.   solve:
     ▪   first order differential equations by separation of variables; solve first order homogeneous, exact, and linear equations;
     ▪   linear differential equations of higher order;
     ▪   homogeneous linear equations with constant coefficients;
     ▪   non-homogeneous linear equations by the methods of undetermined coefficients and variation of parameters;
     ▪   various applications problems related to first and second order equations and systems of linear equations;
     ▪   a differential equation by the power series method;
     ▪   a linear nth order differential equation by utilizing a Laplace transform;
     ▪   linear systems with constant coefficients;
4.   approximate solutions to differential equations by utilizing a slope field or Numerical Methods;
5.   complete projects designed to gain a deeper understanding of course concepts using the software program MatLab.

D.   Course Assessment: Will include:
1.   comprehensive final exam.

E.   Course Content: Will include:
1.   first order differential equations;
2.   applications of first order differential equations;
3.   linear differential equations of higher order;
4.   applications of second order equations;
5.   series solutions;
6.   laplace transforms;
7.   linear systems;
8.   applications of linear systems;
9.   slope fields and Numerical Methods;
10. projects to gain a better understanding of the concepts using the software program MatLab.