SYLLABUS

Embry-Riddle Aeronautical University

Daytona Beach Campus

Course Number:	MA 345	
Term:	Spring 2020	
Instructor:	C. Jacobs	
Office:	COAS 301-36	
Office Hours:	MTWF 2:00 - 3:00 PM	
Course Title:	Differential Equations and Matrix Methods	Cr. Hrs. 4
Section 04:	Meets MWF 1:00 - 1:50 in COAS 302 and Tues 12:45 - 2:00 in COAS 407	
Course Text:	*Fundamentals of Differential Equations* by Nagle and Saff	
MA 345 Website:	`http://users.xecu.net/jacobs/index345.htm`	

Course Description:

Treatment of ordinary differential equations to include principle types of first and second order equations; methods of substitution on simple higher order equations; linear equations and systems of linear equations with constant coefficients; methods of undetermined coefficients and variation of parameters; Laplace transforms; series solutions; linear algebra and matrix methods of solutions; applications to physics and engineering.
Prerequisite: MA 243

Goals:

This course is required by the Aerospace Engineering, Electrical Engineering, Avionics and Engineering Physics degree programs. Its purpose is to provide intermediate mathematical skills for the student to use in many of the applications he will encounter in future engineering courses.

Performance Objectives: The following is a minimal list of skills that you must attain. The requirements of the course include but are not limited to this list.

1. Recognize and solve separable, homogeneous, exact and linear first order differential equations.
2. Construct and solve appropriate differential equations for applied problems involving mixtures, populations and Newtonian mechanics.
3. Calculate numerical solutions of differential equations.
4. Solve homogeneous, linear second and higher order differential equations with constant coefficients.
5. Solve nonhomogenous, linear differential equations with constant coefficients by the Method of Undetermined Coefficients and the Method of Variation of Parameters.
6. Construct and solve applied problems involving mechanical vibrations, forced vibrations and electric circuits.
7. Compute Laplace transforms of polynomials, exponential and trigonometric functions.
8. Compute inverse Laplace transforms of rational function and solve initial-value problems by Laplace Transform Method.
9. Find a power series solution to a given differential equation.
10. Solve a linear system by the Gauss-Jordan elimination method and by Matrix Methods.
11. Compute eigenvalues and eigenvectors of a given matrix.
12. Solve systems of first order linear differential equations by matrix methods.

Grading:

The grade in this course will be computed from homework and exams.

Exam I	21.25%
Exam II	21.25%
Exam III	21.25%
Final Exam	21.25%
Homework	15.00%

Conduct During Exams:

Students will not be allowed to use any formula sheets or notes on exams. Students may not receive assistance from classmates or attempt to copy the work of a classmate during an exam. Violators are subject to immediate failure in the course as well as other administrative sanctions such as suspension if appropriate.

Missed Exams:

A student who misses a regularly scheduled exam may, at the discretion of the instructor, take a make-up exam. However, the student must contact the instructor within 24 hours of the original exam to be eligible for a make-up exam.

Homework:

Homework assignments are collected and graded. Homework must be handed in at the beginning of the class period on the due date. A late homework assignment that is submitted within 24 hours of the due date may be graded, at the discretion of the instructor. If it is graded, it may only be given half credit. Homework that is submitted later than this will be given a score of zero and will not be corrected. If more than one sheet of paper is needed for an assignment then the pages must be stapled. Homework not meeting this standard will be returned with a score of zero.

Students who are having difficulty with any homework assignment are permitted to get some assistance from other instructors or classmates. However, students should not simply copy solutions verbatim or permit others to do their assignments for them.

Disability Support Services:

Those students who have been appropriately certified by the DSS office may take their exams there. However, Professor Jacobs will deliver and pick up all such exams personally rather than rely on students transporting the exams in a sealed envelope. Students will be required to complete all relevant DSS paperwork for each exam and give the appropriate form to Professor Jacobs no later than one week before the exam. Since exams are announced well in advance, this should pose no hardship to any student.

Calculator:

You may need a scientific calculator on some exams. Graphing calculators and calculators capable of symbolic manipulation are not allowed on exams.

Attendance:

Attendance is noted occasionally. A student's attendance record will not be counted toward the final course grade except for borderline cases.

When a student attends a lecture, he should stay for the entire class period. Unless a student becomes ill during class or needs to get to the bathroom, he may not leave class early without prior permission from the instructor.

Classtime is not the time to browse the Internet. Please turn your computer, tablet or smart phone off during class. Come to class alert and ready to work.