Syllabus for Math 55 – Eureka Campus		
Semester & Year	Spring 2017	
Course ID and Section #	Math 55 – E1154	
Instructor's Name	Bruce Wagner	
Day/Time	TuThF 10:05-11:20	
Location	SC 214	
Number of Credits/Units		
Contact Information	*Office location*	SC 216K
	Office hours	W 12:30-1:00, ThF 11:30-12:30
	Phone number	707-476-4207
	Email address	bruce-wagner@redwoods.edu
Textbook Information	*Title & Edition*	Differential Equations, 2nd ed.
	Author	Polking, Boggess, and Arnold
	ISBN	#0131437380

Course Description
A study of ordinary differential equations and solutions, equations of first and second order, linear differential equations, systems of equations, phase plane analysis, existence and uniqueness theorems, applications and modeling, and techniques for obtaining solutions, including series solutions and Laplace transforms.

Student Learning Outcomes
1. Identify the type of a given differential equation and then find exact analytical solutions for first- and second-order differential equations, and systems of differential equations, including the existence and uniqueness of solutions.
2. Apply the mathematics of differential equations to real-world problems and applications such as circuits, mixture problems, population modeling.
3. Apply the use of computer technology to solve differential equations and systems, explore mathematical concepts, and verify results.
4. Compare solutions obtained by use of power series with numerical solutions.
5. Determine the Laplace and inverse Laplace Transform of functions and use these to solve ordinary differential equations.

Special Accommodations
College of the Redwoods complies with the Americans with Disabilities Act in making reasonable accommodations for qualified students with disabilities. Please present your written accommodation request at least one week before the first test so that necessary arrangements can be made. No last-minute arrangements or post-test adjustments will be made. If you have a disability or believe you might benefit from disability related services and may need accommodations, please see me or contact Disabled Students Programs and Services. Students may make requests for alternative media by contacting DSPS at 707-476-4280.

Academic Support
Academic support is available at Counseling and Advising and includes academic advising and educational planning, Academic Support Center for tutoring and proctored tests, and Extended Opportunity Programs & Services, for eligible students, with advising, assistance, tutoring, and more.

Academic Honesty
In the academic community, the high value placed on truth implies a corresponding intolerance of scholastic dishonesty. In cases involving academic dishonesty, determination of the grade and of the

student's status in the course is left primarily to the discretion of the faculty member. In such cases, where the instructor determines that a student has demonstrated academic dishonesty, the student may receive a failing grade for the assignment and/or exam and may be reported to the Chief Student Services Officer or designee. The Student Code of Conduct (AP 5500) is available on the College of the Redwoods website at: http://www.redwoods.edu/board/Board-Policies/Chapter-5-Student-Services, and scroll to AP 5500. Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the college catalog and on the College of the Redwoods website.

Disruptive Classroom Behavior

Student behavior or speech that disrupts the instructional setting will not be tolerated. Disruptive conduct may include, but is not limited to: unwarranted interruptions; failure to adhere to instructor's directions; vulgar or obscene language; slurs or other forms of intimidation; and physically or verbally abusive behavior. In such cases where the instructor determines that a student has disrupted the educational process a disruptive student may be temporarily removed from class. In addition, he or she may be reported to the Chief Student Services Officer or designee. The Student Code of Conduct (AP 5500) is available on the College of the Redwoods website at: http://www.redwoods.edu/board/Board-Policies/Chapter-5-Student-Services and scroll to AP 5500.
Additional information about the rights and responsibilities of students, Board policies, and administrative procedures is located in the college catalog and on the College of the Redwoods website.

Emergency Procedures for the Eureka campus:

Please review the campus evacuation sites, including the closest site to this classroom (posted by the exit of each room). The Eureka **campus emergency map** is available at: (http://www.redwoods.edu/aboutcr/Eureka-Map; choose the evacuation map option). For more information on Public Safety, go to http://www.redwoods.edu/publicsafety. In an emergency that requires an evacuation of the building:

- Be aware of all marked exits from your area and building.
- Once outside, move to the nearest evacuation point outside your building:
- Keep streets and walkways clear for emergency vehicles and personnel.
- Do not leave campus, unless it has been deemed safe by the Incident Commander or campus authorities. (CR's lower parking lot and Tompkins Hill Rd are within the Tsunami Zone.)

RAVE – College of the Redwoods has implemented an emergency alert system. In the event of an emergency on campus you can receive an alert through your personal email and/or phones at your home, office, and cell. Registration is necessary in order to receive emergency alerts. Please go to https://www.GetRave.com/login/Redwoods and use the "Register" button on the top right portion of the registration page to create an account. During the registration process you can elect to add additional information, such as office phone, home phone, cell phone, and personal email. Please use your CR email address as your primary Registration Email. Your CR email address ends with "redwoods.edu." Please contact Public Safety at 707-476-4112 or security@redwoods.edu if you have any questions.

College of the Redwoods is committed to equal opportunity in employment, admission to the college, and in the conduct of all of its programs and activities.

Math 55: Differential Equations

Spring 2017

Eureka section E1154

Instructor: Bruce Wagner
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Course Homepage: http://mse.redwoods.edu/wagner/math55
Class Sessions: TuThF 10:05-11:20 in SC 214

COURSE DESCRIPTION: In a differential equations course, the goal is to solve equations that involve derivatives of functions, and to understand the nature of their solutions. We will study first and second order equations, linear and nonlinear systems of equations, and existence and uniqueness theorems. We will investigate both exact and numerical approximation methods.

The purpose of studying differential equations is to be able to describe natural phenomena mathematically (called modeling). These mathematical descriptions (functions, laws, formulas, equations) can then be used as tools in predicting the behavior of these phenomena. In this regard, we will study various applications and models. Differential equations is the foundation of much of applied mathematics, and consequently is a core course in many engineering, physics, and mathematics programs.

PREREQUISITES: Grade of C or better in Math 50B (or the equivalent)

TEXTBOOK: *Differential Equations*, 2nd edition, by Polking, Boggess, and Arnold. Chapters 1-11 will be the focus of this course. You can also use the expanded version *Differential Equations with Boundary Value Problems,* 2nd edition. Either version may be checked out from Library Reserve for the entire semester.

EXAMS: There will be three midterm exams, but no final exam. Dates for the midterms will be announced later on the course homepage. There may also be some quizzes and class activities.

Makeup exams will only be given if there is a very good and verifiable reason for missing the exam, such as illness or emergency. Notify me immediately if you cannot take an exam. If you know you are going to be away, then you are expected to arrange to take the exam early.

Calculators will be allowed (and may be necessary) on most quizzes and exams. However, there may be some quizzes and portions of exams on which a calculator cannot be used.

HOMEWORK: There will be daily reading and homework assignments that will be mostly computational and routine, and assigned primarily for practice. You are expected to complete these assignments each day, and come to class prepared to discuss them. You are also required to keep a neatly organized binder with your completed homework assignments, and I will collect and check these before each exam. However, you are encouraged to submit these daily assignments early, and you will receive extra credit in that case.

Most of your homework grade will be based on (approximately) weekly homework assignments that will be collected and graded carefully. These assignments will generally be more challenging and will involve more intermediate steps, synthesis of concepts, experimentation, and writing. One of these weekly assignments will be a poster.

Some of the assignments will involve the use of Mathematica to help you learn and explore the concepts of the course. You will also gradually learn how to use TeX (the mathematics typesetting language) to write your solutions. TeX (and probably Mathematica) will also be needed for your final project.

In general, the homework will be indicative of the type and difficulty of material that you need to know for the exams. You are expected to turn in homework assignments on time.

PROJECT: Each student is required to complete a differential equations project. The project will consist of a written paper and a short presentation, and will take the place of the final examination. The subject of the project must be a real-world application of differential equations. Presentations will be given in finals weeks at the time scheduled for the final exam.

GRADING:

Homework, quizzes, and class activities:	250 points
Poster:	25 points
Midterm exams:	150 points
Final project:	100 points

Your course grade will be determined by the grade cutoffs given in the table below. However, in addition, you must earn a cumulative exam/project score of at least 50% to receive a grade of C or above.

85-100%	A
70-84%	B
60-69%	C
50-59%	D

USE OF CALCULATORS AND COMPUTERS: Our class will make extensive use of Mathematica as a computational and visual aid to understanding the course material. We will use Mathematica in the classroom, and you may also use it in the computer lab in Science 212 to help with homework and the project. You may also download a copy to use at home. However, no prior computer knowledge is required for the course – you will receive initial instructions on how to use Mathematica.

Modeling and numerical methods demonstrations will also be provided in Matlab (another mathematical program available at CR) in order to provide a better experience for students who are also enrolled in Math 4. These students are welcome to use Matlab to help with their homework and project.

A good graphing calculator is also recommended. The calculator must be able to do parametric plots in addition to usual plots of functions, and should be able to solve equations numerically. Recommended calculators for students in differential equations are the TI-83+, TI-84+, TI-92, TI-89, TI-86, or TI-85. However, brands from other manufacturers can also be used. You will be expected to be able to use your calculators to numerically solve equations, analyze graphs, and work with data in the course of solving some problems.

The TI-89 and TI-92 can do symbolic calculations, including differentiation and integration. While these calculators are powerful and useful tools, I believe that you should be able to both integrate and differentiate without the use of the calculator. Therefore, you will be expected to show all steps on your homework when performing any integration to receive full credit for your work.

COURSE INFORMATION ON THE WEB: Course information will be available throughout the semester on the World Wide Web. You should consult the homepage for this course (listed above) regularly for information on homework assignments, exams, etc.

ATTENDANCE POLICY: Any student who is absent from class for the amount of time equal to two weeks of classes through week 10 will be withdrawn from the course, unless there are extenuating circumstances that are communicated to the instructor in a timely manner. This policy conforms to Mathematics Department guidelines regarding Faculty Withdrawal of students after census day.

DISABILITIES: Any student who feels that s/he may need an accommodation based on the impact of a disability should contact the instructor as soon as possible. The student will also need to visit the Disabled Student Programs and Services office (476-4280) and obtain a DSPS Support Services Agreement. Every effort will be made to meet accommodation requests. However, no retroactive accommodations will be provided.