

FALL 2020 SYLLABUS – CUYAMACA COLLEGE

MATH 285 – Differential Equations

SECTION 7709: 3 units – ERT

MW 3:30 pm – 4:45 pm

Meet the Teacher!

- **Instructor:** Lamia Raffo
- **Pronouns:** she, her, hers
- contacting me via Canvas Inbox (preferred method of contact) or
- **Email:** lamia.raffo@gcccd.edu

Welcome to Math 285



I am so glad that you chose to be in this class. In math 285, differential equations course, we explore different types of methods to solve various types of differential equations. This includes but is not limited to solving separable, exact, homogenous, Cauchy-Euler equations, and systems of differential equations. In addition, series solutions, singular points, Laplace transforms, and linear systems will be discussed. I am passionate about teaching this course, helping audiences understand it and most importantly, make it relevant to real life. I look forward to working with you this semester! Please let me know how I can help you be successful!

Meet on MW 3:30 pm – 4:45 pm via Zoom

Office Hours and Response Time

- Online (via Canvas Inbox and Zoom video conferencing):
MW from 10:00 - 12:00 pm AND TTH from 3:50 – 4:20 pm
- Questions outside of office hours? I will respond to your message or Q&A post in canvas within 24 hours, M - F. If you do not get a response after 24 hours, please resend.

Course Description

Catalog Description (3 units): This course is an introduction to ordinary differential equations including both quantitative and qualitative methods as well as applications from a variety of disciplines. Introduces the theoretical aspects of differential equations, including establishing when solution(s) exist, and techniques for obtaining solutions, including series solutions, singular points, Laplace transforms and linear systems.

Prerequisite:

“C” grade or higher or “Pass” in MATH 280 or equivalent

Length of class: 16 weeks/ 3 units

Course Content:

- 1) Solutions of ordinary differential equations
- 2) First order DE including separable, homogeneous, exact, and linear
- 3) Existence and uniqueness of solutions
- 4) Applications of first order differential equations such as circuits, mixture problems, population modeling, orthogonal trajectories, and slope fields
- 5) Second order and higher order linear differential equations
- 6) Fundamental solutions, independence, Wronskian
- 7) Nonhomogeneous equations
- 8) Applications of higher order differential equations such as the harmonic oscillator and circuits
- 9) Variation of parameters
- 10) Laplace Transforms
- 11) Series Solutions
- 12) Systems of Ordinary differential equations

Required Materials

1. Textbook (optional): Zill, Dennis G. First Course in Differential Equations with modeling applications. 11th edition. Brooks/Cole, 2011.

2. Webassign access code (Required). You can buy it through Cengage.com

The class key for this class of Math 285 is **cuyamaca 3142 3670**

NOTE: You will need access to the textbook and these class materials daily. Thus, you will need a tablet or laptop computer to access the e-book.

3. Supplemental (optional): Zill, Dennis. Differential Equations (with Modeling Application–Study Solutions Manual). 11th ed. Brooks/Cole, 2011.

4. Calculator (Required): A **Scientific Calculator** and/or **Graphing Calculator** are required. The Mathematics Department of Cuyamaca College highly recommends and supports the use of Texas Instruments Graphing Calculators. For this course, I would recommend the use of a TI-83, TI-84 plus. If you will be taking future mathematics classes, this is a great investment. You can also email the library at cuyamaca.circulation@gcccd.edu about checking one out.

Here is the Calculator Loan Program

- Run in collaboration with the library so students can check out a calculator for the entire semester; we added in the classroom calculators so there are more to lend
- Students **MUST** be enrolled in a Math course at Cuyamaca.
- Starting Monday, August 17 students can go to the backdoor of the library.
- Students must abide by the marks to keep socially distanced.
- Students must be wearing a mask, have a photo ID (any will do), know their student ID number, and have proof they are taking a math class at Cuyamaca (this can be done on their phone).
- Hours are Monday & Tuesday 9:00 am – 6:00 pm; Wednesday & Thursday 9:00 am – 5:00 pm.

5. Three-Ring Binder: Organized with tabs for notes, handouts, etc.

6. Notebook paper, pencils, erasers, highlighters and colored pencils/pens.

7. Grossmont-Cuyamaca Student ID card

IMPORTANT DATES:



August 17 - August 30	Program Adjustment (Last day to add classes/Last day to drop and qualify for a refund and to drop without receiving a “W”).
August 31	Census Day (Semester length Classes)
September 7	Holiday (Labor Day)
September 18	Last Day to Apply for P/NP (semester length classes)
October 10	End of First 8-weeks Session
November 8	Last day to drop with a “W”. (It is the student’s responsibility to take care of any administrative procedures involved in dropping should he/she stop attending class.)
November 11	Holiday (Veterans' Day Observed)
November 26 - 28	Holiday (Thanksgiving)
December 8 - 10	Final Examinations
Wednesday, December 9th	Final Exam day, from 3:00 pm - 5:00 pm

You can see the [Fall 2020 academic](#) calendar in its entirety

Assessment

Homework on Webassign – It is beneficial that you read the material in your textbook before it is covered in class and complete the homework assignments in a timely and responsible manner.

You will have the opportunity to have two extension requests without penalty (the extension request has to be made within a week after the initial due date). In addition, I will drop your two lowest homework scores; the two dropped scores are there for emergency situations. Homework assignments will be assigned and completed on WebAssign; and they are graded automatically. Homework due dates are found on the WebAssign site for the class but will be **due every Sunday of each week** by 11:59 p.m. Because the material from this course builds on itself, it is important to keep up with the homework assignments,

as they are due. Make sure you check WebAssign daily to ensure you are caught up. To accommodate any technical difficulties, you are allowed 10 attempts on each HW.

Quizzes on Webassign – Each week you may have a short homework quiz via webassign; each will open after class and is due by 11:59 pm on Sunday. The quizzes will be open-book, open-notes. The problems will be lifted DIRECTLY from the previous week's assigned homework or similar. To accommodate any technical difficulties you may have, I typically allow two attempts for each quiz. There are no extension requests for online quizzes; I will drop two of your lowest Quiz scores. Each quiz is worth 10 points. I might require that you upload the full solution for some of the quizzes on webassign to receive full credit (i.e. show work will be required).

Reading Assignments, Discussion, Group Work & Other Assignments –

Discussions are an integral part to applying what is learned from the reading assignments. Part of your work will be completed through the interactive reading assignments on Canvas. Interactive reading includes discussions focused around reading passages. Additionally, each week, you may have a group work covering the interactive reading materials via Zoom.

Initial posts to any discussion will be due by Thursday and post TWO responses to other group members' posts is due Sunday. For example, if I assign a discussion on August 17 then your initial response is due Thursday, August 20 and your two classmates' responses will be due Sunday, August 23. I will drop your lowest scores from this category.

Assignments' due dates will be on canvas with more details on the initial and final submissions.

Canvas: <https://www.cuyamaca.edu/student-support/technology-center/canvas-help.php>

Exams – There will be two exams during the semester; each exam is worth 100 points. You **CAN NOT** make-up a missed exam! However, in the event of an emergency, communicate with me immediately or preferable a few days before the exam to possibly arrange an appointment for you to take the exam. Some exams will be on webassign (to accommodate any technical difficulties you may have; students will have 2 attempts) and

other exams will be on canvas (no attempts). In all cases, step-by-step solution is required to be uploaded.

Final Exam – A comprehensive final exam will be given at the end of the course. The final exam is mandatory and may not be dropped. If you do not take the final, you may receive a failing grade. This is a Cuyamaca Math Department standard policy to pass the course.

- To earn a C or better in the class a student must earn an overall grade of C or better AND
 1. a D or better on the final assessment(s) OR
 2. an average of a C or better on all exams which includes the final assessment(s) (without dropping any exam scores) .

Final Exam: Wednesday, December 9th from 3:00 pm – 5:00 pm

Cuyamaca Tutoring is Online!

If you feel you need more help than I or other classmates can offer, then it is highly recommended that you utilize the free math tutoring services available in the STEM Achievement Center (Tutoring Center) or Academic Resource Center (ARC). The hours are Monday & Thursday 9:00 am – 6:00 pm; Tuesday & Wednesday 9:00 am – 7:00 pm; Friday 10:00 am – 2:00 pm. You can make half-hour one-on-one appointments with tutors; You will need your student ID to do this. To make an appointment, please either call 619-800-2407 or email cuyamacatutors@gmail.com with the course and time you would like to meet with a tutor.

Please understand these hours are subject to budget restrictions and may change. The hours of both centers are [located online](#).

There is also [free online tutoring](#) provided by the college through NetTutor: Cuyamaca College provides all registered students with the opportunity to access online tutoring through NetTutor. Online tutoring is available in a wide variety of subjects, 24/7, to supplement on-campus tutoring that the STEM Achievement Center and Academic Resource Center already provides.

Student Access to free Online Tutoring:

1. Log into <https://gcccd.instructure.com/login/canvas>
2. Click one of your courses from the Dashboard
3. Click “NetTutor” on the course menu *
4. Click on a group (ex. Math) to receive tutoring in that area.

Attendance and Participation

Regular attendance and class participation is as vital in an online class as it is in a traditional classroom. Your presence will be counted not only by taking roll via Zoom but also by your regular contributions to discussions and activities. Attendance in an online course is determined by participation in academically related activities. You will be considered present if there is evidence of your participation in required course activities including, but not limited to, taking a quiz or participating in a discussion on canvas. You will be considered absent if there is no evidence of your participation in the academic activities of this course.

Students who are absent (i.e. not actively participating) for more than one week of this 16-week course may be dropped. However, if *you* choose to drop the course you will need to do so officially through Admissions and then notify your instructor.

Grading Categories & Weights

Course grades are a way to measure what you have learned this semester related to our key learning goals. Learning is a process that necessitates collaboration, participation, productive struggle, effort, and making mistakes that produces a better performance. Therefore, you earn part of your grade through low-stakes opportunities that value teamwork, communication, and collaboration. Other parts of the grade are based on high-stakes assessments of your attainment of the learning goals for the course.

The following is the breakdown for your Math 285 grade:

- Canvas Readings and Discussions & Group Work on Zoom = 15%
- Webassign Homework = 15%
- Webassign Quizzes = 15%
- Exams = 30%
- Final Exam or project = 25%

The grading scale is:

A = 90 – 100%

B = 80 – 89.99%

C = 70 – 79.99%

D = 60 – 69.99%

F = below 60%.

Late Work

Although emergencies and other events often occur unexpectedly for us, it is important that you inform me as soon as possible so I may know how to support you in your needs. If you become aware that you will be absent or that an emergency has occurred, please notify me ASAP so that we can arrange for an early turn-in of an assignment or arrange for a later date to make-up the work.

The due date for homework will be on every Sunday at 11:59pm. In order to have the best learning experience, it is advisable for you to keep track of posted due dates on Canvas. I recommend that you do not fall behind on your assignments as it will help you with acquire a deeper understanding of the material. In addition, engaging and completing practice questions and reading assignments on the given due dates will assist in understanding the topics discussed in class. If you feel that you are having trouble keeping up with the assignments, please communicate with me so I can know how to support you in this effort.

Again, don't be stressed if you miss something as I have provided you with these opportunities to not harm your grades, but to support and supplement the material you are learning in the classroom. The best way for you to succeed in this class is for you to communicate with me as soon as possible if you are struggling, and to not leave it until the end of the course.

- Lowest 2 scores from Homework will be dropped so that if you unexpectedly miss one or two deadlines due to illness or personal issues, your grade will not be lowered.
- For all quizzes on webassign, you will have a week to complete. I will drop 2 lowest quizzes for emergency situations.

Some assignments have strict due dates because they require communication with your classmates in real-time. The following assignment must be completed in real-time and cannot be made up after the due date. If you miss one, don't worry, your lowest score will be dropped.

Strict Due Dates:

- Discussion boards are an important portion of your participation in this course. It requires back and forth dialogues with your classmates discussing the topic for the day. It is crucial that you post your comments by a certain time to allow for timely participation by your classmates to read and respond to posts. As a result, the discussion boards will have strict, inflexible due dates, and the initial post on the discussion board has to be submitted by the due date disclosed in Canvas. The discussion board will remain

unlocked for a few days after the due date to allow you to respond to your classmates' posts. You can refer to Canvas to identify how many days you have to post your responses. These days will also allow you to upload your initial posts should you miss the initial post due date. You will no longer be able to post or reply for complete credit once the discussion board locks after the "replies deadline."

Course Location & Technical Support

This course is taught in Canvas. To access our course, log in to Canvas via [Cuyamaca College's website](#) by clicking the link at the top of the page.

Questions about Canvas are best handled by Canvas Support (1-844-629-6835), although I will try to assist you with technical questions when possible. The [Canvas Guides](#) are an excellent resource for you as well.

If you can't log in to Canvas, please call the Cuyamaca College [Help Desk](#) at 619-660-4395 or email c-helpdesk@gccd.edu. If you can't log in to WebAdvisor, call [Admissions & Records](#) at 619-660-4275.

Student Learning Outcomes

Upon successful completion of this course, students will be able to:

- 1) Create and analyze mathematical models using ordinary differential equations;
- 2) Identify the type of a given differential equation and select and apply the appropriate analytical technique for finding the solution of first order and selected higher order ordinary differential equations;
- 3) Apply the existence and uniqueness theorems for ordinary differential equations;
- 4) Find power series solutions to ordinary differential equations;
- 5) Determine the Laplace Transform and inverse Laplace Transform of functions; and
- 6) Solve Linear Systems of ordinary differential equations.

Academic Integrity

Students are expected to adhere to the [College's Academic Honesty/Dishonesty Policy](#) found in the College Catalog. Academic dishonesty of any type by a student provides grounds for disciplinary action by the instructor or college. In written work, no material may be copied from another without proper quotation marks and appropriate documentation.

By enrolling in a distance education course, you agree that you are the person accessing and completing the work for this course and will not share your username and password with others.

Plagiarism is considered academic theft because it is stealing someone else's words or ideas, but the plagiarizer robs himself or herself as well. This course will provide you with the opportunity to improve your reading, thinking, and writing skills—don't rob yourself of that chance.

Plagiarism detection software in Canvas will be used to scan written submissions. Plagiarized work will earn a failing grade and may put the plagiarizer at risk of failing the course and/or facing misconduct charges.

This course adheres to the policies outlined in the Cuyamaca College catalog. For further information, see Academic Policies stated in the [catalog](#).

Cuyamaca College students are bound by the [Student Code of Conduct](#). In this course, cheating, plagiarism, fraud and/or lying may result in a grade of "F" for the assignment or test with no make-up work permitted. Any of these infractions may also result in formal disciplinary action by the Associate Dean of Student Affairs as described in the Student Code of Conduct.

Diversity Statement and Respectful Conduct

I would like our class to be a supportive learning environment that values and builds on the richly diverse identities, perspectives, and experiences of our group. Please help me develop this environment by honoring the diverse identities of your classmates and letting your instructor know (via anonymous surveys or email, for example) if an assignment, comment, etc. makes you feel uncomfortable.

Both in the readings and in discussions, you will likely encounter cultures, ideas, and values that differ from your own. These are valuable opportunities to learn more about different perspectives and where they intersect with yours. We all see the world from a point of view informed by our experiences and backgrounds, and what we read and discuss can open new windows through which to understand both our texts and world

around us. You are encouraged to contribute your ideas about our discussion prompts freely, but please remember to demonstrate respect for the works as well as your classmates and instructor. We all have unconscious biases that stem from our experiences, recognizing and discussing them can lead to unexpected insights.

Conversely, disrespectful or threatening responses tend to shut down conversation and insight, and so these kinds of comments will be promptly addressed by your instructor. To keep our interactions safe and productive, please know that anyone who repeatedly engages in disrespectful or otherwise inappropriate behavior will be locked out of the discussion for the week and/or face student misconduct charges. Please join me in creating a comfortable and productive learning environment for us all.

Instructor Communication: Regular Effective Contact

I am looking forward to working closely with you this semester, and you can expect me to play an active role in our course. I will post announcements every week, teach course material through online lecture content, join you in class discussions to help you understand course concepts, and provide detailed feedback on major assignments within one week of submission. I will also answer questions throughout the semester in the Q&A forum and in our discussions, usually within 24 hours M – F. Please let me know when you need help—that’s why I’m here! Feel free to contact me by email through Canvas whenever you have questions or concerns.

Student Support Services

Cuyamaca College has many programs and services available to support students in a variety of ways. Check out the [Student Resource Guide](#) Through Canvas, you can also access Cuyamaca-Net Tutor which allows you to get help from a tutor online.

DSPS Accommodations

Academic accommodations are available for students with disabilities. Please identify yourself to me (after class) and/or to Disabled Students Programs & Services staff so that the appropriate accommodations can be ensured. If you suspect that you have a learning disability or need services for any other type of disability, please

contact the Disabled Students Programs & Services (DSP&S) Office, A-113, at the Student Services One-Stop Center or call (619) 660-4239 or TTY: 619-660-4386.

EMAIL: cuyamaca.dsps@gcccd.edu

Cuyamaca Cares

Cuyamaca Cares is a program that offers many opportunities for help with food, housing, and personal counseling. Since the food bank on campus is currently closed, there will be drive through opportunities coming soon which will be shared. If you have a specific need, please email Kaylin Rosal (Kaylin.Rosal@gcccd.edu).

Tentative Course Calendar – Fall 2020

Any information in this syllabus is tentative and may change at the discretion of the instructor at any time. This is a 3-unit course. Therefore, you should plan on studying, watching videos, and working on assignments at least 4 hours each day five or six days per week.

Week 1	8/17 — Introduce the course, Start 1.1 Definitions	8/19 — 1.1 Definitions
Week 2	8/24 — 1.1 Initial Value Problems	8/26 — Section 1.2
Week 3	8/31 — 1.2	9/02 — 2.2 Separable DE
Week 4	9/07 — Holiday	9/09 — 2.3 Linear Equations
Week 5	9/14 — 2.4 Exact Equations	9/16 — 2.1 solve DE using Graphs
Week 6	9/21 — 2.5 Substitution	9/23 — 1.3, 3.1 Linear Models
Week 7	9/28 — 3.1	9/30 — 4.1
Week 8	10/05 — 4.2 Reduction of Order	10/07 — Exam 1
Week 9	10/12 — 4.3 Homog. DE	10/14 — 4.4 Undetermined Coeff
Week 10	10/19 — 4.6 Variation of Parameters	10/21 — 4.7 Cauchy-Euler DE
Week 11	10/26 — 4.9 Solving Systems of D by Elimination	10/28 — 6.1 Review Power Series

Week 12	11/02 — 6.2 Solutions About Ordinary Points	11/04 — 6.2
Week 13	11/09 — 6.3 Solutions About Singular Points	11/11 — Holiday
Week 14	11/16 — 6.3	11/18 — Exam 2
Week 15	11/23 — 7.1 Definition of the Laplace Transform	11/25 — 7.1
Week 16	11/30 — 7.2 Inverse Laplace Transforms	12/02 — 7.2, 7.3
Week 17	12/07 — Finish 7.3	12/09 Final Exam
Final Examinations <u>No regular class meetings</u>		December 8 — 14
Final Exam	Wednesday, December 9th	3:00 pm – 5:00pm

