



AP Calculus AB – 2021-22

Math 251 – Spring 2022

SYLLABUS

Instructor: Troy Tactay

CGCC Credits: 5

Meeting times and Location: Hood River Valley High School, Room D09

Contact Information

How to get help: Preps - T1 Period 3, T2 Period 2, T3 Period 5. Math Lab - T2 Period 5. Lunch and after school. You may access my syllabus, assignment sheets, and all worksheets on my Teacher Page on the school website or from a separate google classroom (join code will be given in class) which also includes a lesson pdf and video lesson for each assignment. This is a good resource if you're absent to class. In addition, I will live stream every class via Google Meets, using the code tac .

Phone Numbers/email:

Office: 541-386-4500 ext 4610 (HRVHS)

Cell/text: 541-399-1024 (personal cell phone)

E-mail: troy.tactay@hoodriver.k12.or.us

Textbooks and Materials

- Calculus for AP. Ron Larson, Paul Battaglia. Cengage Learning. 2017. First Edition.
- Amsco's AP Calculus AB/BC: Preparing for the Advanced Placement Examinations. Maxine Lifshitz. Amsco School Publications. 2004.
- Master the AP Calculus AB & BC Tests. W. Michael Kelly and Contributing Author, Mark Wilding. Peterson's, a division of Thomson Learning, Inc. 2002.

(AP is a registered trademark of the College Entrance Examination Board, which does not endorse these books.)

- Graphing calculator required (any model from TI-83 to TI-89) or other CAS calculator recommended.

Course Description - This course will cover all topics from Math 251 and AP Calculus AB

CGCC Math 251: Includes limits, continuity, derivatives and its applications.

AP Calculus AB: Includes limits, continuity, derivatives and its applications as well as integral calculus and its applications.

Prerequisites: CGCC MTH 112 or HRVHS Honors Pre-Calculus

Math 251 (AP Calculus AB) Intended Outcomes for the Course

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

- Recognize applications in which the concept of limits, derivatives, and (integrals) can aid in overall understanding.
- Construct appropriate models using limits, derivatives, and (integrals).
- Accurately compute results from models through the appropriate use of technology, limits, derivatives, algebra, and (integrals).
- Analyze and effectively communicate results within a mathematical context.

Math 251 Core Learning Outcomes

Through their respective disciplines, CGCC students who earn a degree can:

- Major** 1. Communicate effectively using appropriate reading, writing, listening, and speaking skills. (*Communication*)
- Major** 2. Creatively solve problems by using relevant methods of research, personal reflection, reasoning, and evaluation of information. (*Critical thinking and Problem-Solving*)
- Major** 3. Extract, interpret, evaluate, communicate, and apply quantitative information and methods to solve problems, evaluate claims, and support decisions in their academic, professional and private lives. (*Quantitative Literacy*)
- Minor** 4. Recognize the consequences of human activity upon our social and natural world. (*Community and Environmental Responsibility*)

Classroom Expectations

- Student is expected to arrive to class (or Google Meets if we go back to Distance Learning) on time and stay for the entirety of the class session, unless you complete your assignment.
- No cell phones during class unless using the calculator app. Note: No cell phones will be allowed during a test.
- Exams may only be made up if prior notification is given to the instructor and make-ups are at the discretion of the instructor. There are no retakes of Exams.
- All students are expected to participate in classroom discussions, in-class activities and practice problems.

LETTER GRADES

Classwork: Homework and Quizzes – **10%** of overall Semester Grade. Expect about 30 minutes to one hour of homework.

ARC (Activities/Responsibility/Cooperation) Points – **5%** of overall Semester Grade. This is basically behavior points. Students will lose points for disruptive behavior such as excessive talking, using electronic devices, tardies, and leaving class for over 5 minutes. **There are no ARC Points if we go back to Distance Learning.**

Tests – **45%** of overall Semester Grade. Projects will be graded as tests.

Final Exam – **40%** of overall Semester Grade.

There are NO Test or Final Exam RETAKES. You are expected to finish during the class period.

Grade Scale (Note that HRVHS gives +- grades however CGCC does not)

A 90.0% or above B 80.0% - 89.99% C 70.0% - 79.99% D 60.0% - 69.99% F less than 60.0%

Tentative Activity/Assignment Schedule - Math 251 Topics are highlighted

The course content and requirements may be adjusted in response to institutional, weather, or class situations as needed with adequate notice to students.

Week	Weekly Schedule	Homework - Assignment Sheets will be given at the start of every chapter with pages and specific problem numbers
	Chapter 1: Functions and Graphs (3 weeks)	
Week 1	A. Continuity and The Intermediate Value Theorem Simplify, Graph, and Analyze Basic Functions and their Graphs B. Understand the Properties and Language of Functions and Inverses. Graph a Function from a Family of Functions - Translations, Reflections, and Amplitudes	Section 1.1 homework Section 1.2 homework
Week 2	C. Introduction – Instantaneous rate of change and the need for limits Limit Theorems and Evaluating Limits D. One and two-sided limits: Squeeze Theorem Limits as Infinity and Infinity as a Limit Ch 1 Review NO TEST FOR THIS UNIT	Section 1.3 homework Section 1.4 to 1.6 homework AP Ch1 Practice Test

	<u>Chapter: Introduction to The Derivative</u> (3 weeks)	
Week 3	A. Limit Definition of the Derivative B. The Derivative as the Average Rate of Change Difference Quotient C. Derivatives as Functions :Higher Order Derivatives Derivatives and the Shape of Graphs	The Derivative Day 1 Worksheet The Derivative Day 2 Worksheet The Derivative Day 3 Worksheet
Week 4	E. Interpret the meaning of the Derivative F. Use 1 st and 2 nd Derivatives to Identify Concavity and Points of Inflection	The Derivative Day 4 Worksheet The Derivative Day 5 Worksheet
Week 5	G. Find the Equation of a Tangent Line and Local Linearization Chapter Test	The Derivative Day 6 Worksheet Ch Review Ch Test

	<u>Chapter 2: Rules and Shortcuts of The Derivative</u> (4 weeks)	
Week 6	A. Derivatives of Polynomials and the Binomial Expansion Theorem Derivatives of Exponential Function B. Derivatives of Trigonometric Functions Derivative Theorems; Product Rule - Quotient Rule E. Chain Rule	Section 2.2 Homework Section 2.3 Day 1 Homework Section 2.3 Day 2 Homework
Week 7	F. 2 nd Derivatives and Higher Order Derivatives G. Derivatives of Natural Logs	Section 2.4 Day 1 Homework Section 2.4 Day 2 Homework
Week 8	H. Implicit Function Differentiation I. Derivative of Inverse Functions and Inverse Trigonometric Functions	Section 2.5 Homework Section 2.6 Homework
Week 9	J. Tangent Line Approximations and Differentials Chapter 2 Test	Ch 2 Review Ch 2 Test

	Chapter 3: Using Derivatives to Understand the Behavior of the Parent Function (5 weeks)	
Week 10	A. Critical Points, First Derivative Tests , Local (Relative) Extrema, and Global (Absolute Extrema) B. Intervals of Increase or Decrease, Concavity, and Points of Inflection C. Extreme Value Theorem and Closed Interval Problems	Section 3.3 Day 1 Homework Section 3.3 Day 2 Homework Section 3.1 Homework
Week 11	D. Finding Intervals of Concave Up or Down Calculus and Graphing E. Use the Second Derivative Test to Find Relative Extrema	Section 3.4 Day 1 Homework Section 3.4 Day 2 Homework
Week 12	F. Optimization G. Related Rates E. Use the Derivative to Solve Problems Involving Position, Velocity, and Acceleration of a Particle in Motion or Projectile	Section 3.6 Homework Section 2.7 Homework Particles in Motion Worksheet
Week 13	F. The Intermediate Value Theorem, The Mean Value Theorem , and Rolle's Theorem G. Evaluate Limits using L'Hôpital's Rule Newton's Method	Section 3.2 Homework L'Hôpital's Rule and Newtons Method Wkst
Week 14	Chapter 3 Test	Ch 3 Review Ch 3 Test

	Chapter 4 Part 1: The Definite Integral (4 weeks)	
Week 15	A. Area Under a Curve Using Riemann Sums Left- and Right-Hand Sums, Trapezoid Rule, Midpoint Rule B. Approximate Definite Integral Using Area C. Use the Short-Cuts to Find the Antiderivatives or Indefinite Integrals of Power Functions	Reimann Sums and Definite Integrals Worksheet Section 4.3 Homework Section 4.1 Homework
Week 16	D. Integrate Exponential, Natural Logarithmic, and Trigonometric Functions Apply Fundamental Theorem of Calculus to Find the Definite Integral E. Apply The Fundamental Theorem of Calculus to Find Total Change of the Antiderivative from Rates Average Value of a Function	Section 4.4 Day 1 Homework Section 4.4 Day 2 Homework
Week 17	F. Using Antiderivatives and The Fundamental Theorem of Calculus to Solve Initial Value Problems G. Find the Area Between Two Functions H. Use that Area of the Function to Graph the Antiderivative	Fundamental Theorem of Calculus Wkst Section 4.4 Day 3 Homework Sketching Antiderivatives Worksheet
Week 18	Chapter 4 Part 1 Test	Ch 4 Review Ch 4 Test

	<u>Chapter 4 Part 2: More on The Definite Integral</u> (3 weeks)	
Week 19	A. Integrate by u -Substitution 1. Indefinite Integrals 2. Definite Integrals	Section 4.5 Day 1 Homework Section 4.5 Day 2 Homework
Week 20	C. Integrating Natural Logarithms C. Solve Differential Equations by Antidifferentiation D The Second Fundamental Theorem of Calculus E. Population Density	Section 4.6 Homework Section 4.4 Homework Population Density Worksheet
Week 21	FINAL EXAM	Review FINAL EXAM

	<u>Additional AP Topics of The Definite Integral and AP Exam Review</u> (8 to 9 weeks)	
Week 22	A. Find the Volumes of Solids of Revolution 1. Disk Method 2. Washer Method	Unit 1 Day 1 Worksheet Unit 1 Day 2 Worksheet
Week 23	B. Find the Volumes of Solids with Known Cross Sections Perpendicular to the x or y axes	Unit 1 Day 3 Worksheet Unit 1 Day 4 Worksheet
Week 24	C. Analyze Rates Using the Fundamental Theorem of Calculus D. Analyze Two Rate Functions Over a Given Interval	Unit 2 Day 1 Worksheet Unit 2 Day 2 Worksheet
Week 25	AP Test Practice 1	Review AP Test Practice 1
Week 26	E. Solve Differential Equations by Separation of Variables F. Sketch the Slope Fields of the Solutions of Differential Equations	Unit 3 Day 1 Worksheet Unit 3 Day 2 Worksheet
Week 27	G. Solve Integral Function Problems 1. Use The Second Fundamental Theorem of Calculus a. Find Intervals of Increase/Decrease b. Find Relative Extrema c. Find Intervals of Concave Up/Down and Points of Inflection 2. Graph the Integral Functions	Unit 4 Day 1 Worksheet Unit 4 Day 2 Worksheet Unit 4 Day 3 Worksheet Unit 4 Day 4 Worksheet
Week 28	AP Test Practice 2	Review AP Test Practice 1
Week 29	AP Exam Review	Review Material
Week 30	AP Exam Review AP CALCULUS AB EXAM - Monday, May 9, 2022	More Review Material AP CALCULUS AB EXAM

	Unit after the AP Exam : AP Calculus BC Preview (4 weeks)	
Week 31	PROJECT: Derivative project	PROJECT due in one week
Week 32	A. Find the Derivative of Hyperbolic Trigonometric Functions (Cosh and Sinh) B. Apply Newton's Method to Approximate Roots of a Differentiable Function	Section 3.5 Worksheet Newton's Method Worksheet
Week 33	C. Trigonometric Limits D. Exponential Growth and Decay	Trig Limits Worksheet Exponential Growth and Decay Wkst
Week 34	Test (on last 3 weeks only)	Review TEST

Important CGCC Grading Information

IMPORTANT CHANGE TO GRADING POLICY:

The student is the only person who can file a request for a grade other than an A-F. Faculty no longer has the option of giving a P/NP or audit grade if the student does not officially request it by the deadlines through Student Services. Once the grade request has been submitted by the student, the grade option cannot be changed.

PASS/NO PASS:

With instructor approval, a student can change their grading option to pass/no pass (if P/NP is an approved option). Students will have through week 8 of the term to choose between A-F and P/NP. Two things must occur:

- 1) The student must obtain the instructor's signature on the Registration Form.
- 2) The student must submit the Registration Form to Student Services by noon on Friday of the eighth week of the term.

After the eighth week of the term, students will no longer be able to change their grading option between letter grad (A-F) and pass/no pass (P/NP). It **MUST** be done prior to the eighth week.

AUDIT:

With instructor approval, a student can choose to audit a course (if AUD is an approved option). Students must make this selection prior to the end of the second week of the term and submit appropriate forms through Student Services.

CGCC Policy Statements

Academic Honesty – Plagiarism/Cheating Statement:

Students are expected to be honest and ethical in their academic work. Academic dishonesty includes cheating and plagiarism. All work submitted in this course is to be your own new, original work written in response to the assignments. Consciously or unknowingly presenting the ideas or writings of others as your own will result in academic sanctions that may include a grade of F for the assignment or for the class and possible institutional sanctions including suspension or expulsion. See the [Student Handbook](https://www.cgcc.edu/students). <https://www.cgcc.edu/students>.

ADA Statement:

CGCC is committed to providing support to students with disabilities. Students requesting assistance related to a disability should contact the Student Support Services Coordinator at (541) 506-6046 or by email at sdahl@cgcc.edu as early in the term as possible for information and assistance regarding accommodations. 711 Relay. For more information, visit www.cgcc.edu/disability.

Non-Discrimination Statement:

It is the policy of Columbia Gorge Community College and its Board of Education that there will be no discrimination or harassment on the grounds of race, color, sex, marital status, national origin, religion, age, disability, veteran status, sexual orientation, and any other status protected by applicable local, state, or federal law in any educational programs, activities, or employment.

Flexibility Statement:

The course content and requirements may be adjusted in response to institutional, weather, or class situations as needed, with adequate notice to students.

Alternative Assignment Statement:

Requests for accommodations must be made during the first week of the course by submitting in writing the dates of observances.

Diversity, Equity and Inclusivity Statement:

Columbia Gorge Community College is dedicated to building and fostering a global, positive learning environment where individual differences are welcomed, appreciated, and respected. CGCC respects the expression of diverse perspectives, abilities, interests and backgrounds, understanding that these will strengthen our ability to collaborate effectively and to solve complex challenges. The college provides equal access to and opportunity in our academic programs and facilities.

Student Support Services Available:

If you or a fellow student do not have reliable access to food or other essential needs, or if personal concerns are interfering with success, there are resources and counseling services available through CGCC's Support Services. For information, please contact Shayna Dahl at 541-506-6046; sdahl@cgcc.edu, or visit www.cgcc.edu/support.

If we go back to Distance Learning (CDL)

Typical Class Period (Teacher Facilitated Learning):

- JOIN Google Meets using the Meeting Code tac. Attendance will be taken.
- LESSON over the new assignment.
- WORK on the assignment, which is found in Google Classroom.
- SUBMIT assignment in one Google doc via Google Classroom.

You will have three ways to access my lessons:

pdf lesson - found in Google Classroom

Video lesson - found in Google Classroom

A virtual lesson - during the period

Turning in Assignments: Everything will be done in Google Classroom.

- Print assignment and do the work directly on what you printed OR
- Do the work on separate sheets of paper.

Take a picture with your school issued ipad, upload the pictures on one google doc, and submit in Google Classroom.

Office Hours: Time TBD. Not Mandatory.

I will keep my Google Meets on during my Office Hours. Use the Meeting Code tac. Use this time to ask questions about anything...problems on the assignments, review material with me, how to access stuff, what's going on around school, etc.

Your official grades will still be in HAC.

Not every procedure or rule in this may apply during distance Learning. Adjustments may be necessary.

Classroom Rules / Expectations - Breaking the Rules results in at least 0 ARC (Behavior) Points for the day.

Breaking multiple rules results in multiple days of 0 ARC Points.

1. **NO TALKING WHILE I'M TALKING and DO NOT BE DISRUPTIVE AT ANY TIME!!!!**

Talking means having any kind of words come out of your mouth. Therefore, whispering is also talking. I suggest to not talk even during work time. If you have questions or need help, don't ask anyone except for me.

Do not be disruptive at any time from the instant when the class starts to when **EVERYONE** is done with their assignment.

Being **disruptive** includes but is not limited to the following behaviors: talking while Mr. Tactay is talking, swearing or using any inappropriate words, making rude comments, making noises with your pencil, chair, desk, etc., making noises with yourself (burping, whistling, talking to yourself, foot tapping, etc.), non-verbal communication with other students at inappropriate times.

In other words, if Mr. Tactay corrects your behavior by telling you to "quiet down" or "stop doing that" or "get back to work," then you are either talking or being disruptive.

2. **NO USING CELL PHONES or OTHER ELECTRONIC DEVICES (except for Ipads) IN CLASS!!!!**

When you arrive to class, place your cell phone in the appropriate pocket in the cell phone organizer. It will remain there for the entire class period. Not following this policy automatically results in 0 ARC points.

If you don't have a phone or if you forget your phone, you will still receive 0 ARC points. A parent will need to email or call to verify that you legitimately did not have your phone in order to get your points back.

Ipads may only be used to look at your Calculus Textbook or at the key for the worksheets. All other electronic devices must be put away, OUT OF SIGHT, and TURNED OFF completely.

Using your phone when you claim to not have it or if you use any other electronic device will result in **THREE DAYS OF ZERO ARC POINTS.**

3. Come to class and be on time. Tardies and leaving class during my lecture or for more than 5 minutes will result in 0 ARC points.

4. Be seated during the entire class period. Leave your seats only when necessary such as sharpening your pencil, getting materials, and throwing away trash. No standing by the doors at the end of class. **If the bells are not working, you will leave when Mr. Tactay releases you.**

5. Work throughout the entire class period until you are completely done with the day's assignment. **Work only on your MATH assignment during class.** That means . . . **No reading books or magazines, No card playing, No working on other assignments from other classes** unless you are completely done with the day's assignment.

6. No backpacks are allowed on your desks/tables.

7. You may have food or drinks in class, but no sharing. Eat and drink your own stuff only. Only restriction - No sunflower seeds.

8. Pick up any pieces of trash - despite how small - which are on the floor and or on top of your desks/tables.

9. No one is allowed to go to the library during class. However, if you really need to go to the library to make up work from other class, you may do so but this will result in **0 ARC Points.** No more than three people may go to the library.

10. Leave everything on my desk alone. Do not touch or take anything in or on my desk.

11. Sit properly - Do not put your feet up on desks/tables or chairs. No sitting on desks/tables or the back supports of chairs.

12. No sleeping in class.

13. No one from outside of class is allowed to speak to you during class, except for teachers or parents.

14. No socializing in class.

15. No passing notes in class.

16. No complaining, whining and making excuses.

17. No asking for free time or to go outside of class for a nature walk, exercise, etc.

19. No childish behaviors such as spit wads, paper airplanes, throwing pencils at the ceiling, etc.

20. No writing on the desks/tables/chairs.

You may complete the google form from our Google Classroom OR sign below to confirm that you read and understand this course's expectations and guidelines. Detach this bottom portion and return to Mr. Tactay.

PRINT Student's Name _____

Date _____

PRINT Parent/Guardian's Name _____

Parent/Guardian's Signature _____