Advanced Placement (AP) Calculus AB
A college-level course

2017-2018

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The Course

The AP Calculus AB course is a yearlong course that is designed to challenge the highly motivated learner of mathematics. The AP Calculus AB course is essentially equal to one semester of college/university level Calculus (the 1st semester of a university/college's e sequence). The students enrolled in AP Calculus AB at HeLa will be challenged by both the amount of content to be mastered and the level of critical thinking and problem solving which is required. It is assumed the students enrolled in the AP calculus AB course at HeLa HS will also sign up for and take the AP test in May.

The Calculus AB course at HeLa is strictly for the learning of and applications of Calculus. So while this course is not strictly designed for the AP test, the course is taught at the level necessary for students to have success on the AP Calculus test (the test is taken worldwide on Tuesday, May 15th). The AP test will challenge even the best problem solvers and the highest achieving learners of mathematics, thus the same is true of this course. The expectations of all students in the AP Calculus AB course is they are ready for the challenges embedded in an AP math course and also that the students recognize and acknowledge they are enrolled in a college/university level mathematics course.

Benefits and Challenges of AP Calculus AB for the student

Benefits of AP Calculus AB (in no particular order and definitely not an exhaustive list)

- Students will be challenged at a level comparable with just about any university or collegiate 1st semester Calculus course.
- Students will be working in a classroom with other students who have all opted for the more challenging course option.
- The thinking and problem solving skills required for AP Calculus AB are modeled after the requirements necessary for success in the AP Calculus AB test and thus those required to be successful in university and collegiate STEM fields.
- Students can earn credits and/or placement for the university or college they attend upon graduation of HeLa high school. This benefit is predicated on student taking the AP test for the course and scoring at the level required by their university/college (most university/colleges will recognize a 3 for placement and for credit…see the AP section later for more detail)

Challenges of AP Calculus AB

- Students are taking a course in their high school years which is equivalent to a calculus course at any university or college.
- Students will be expected to do mathematics practice on a daily basis (class only meets three times a week)
- Students will, at times, be expected to do independent study (often on review topics and/or basic skills but occasionally prior to a new lesson as well)
- To be successful students will need to be (or grow to be) comfortable applying new learnings to unique situations/problems.
- Course standards and success rely heavily upon a student's mastery of algebraic skills.
- Course standards require students to work and problem solve with information given in numerical (tables, raw data), analytical (equations) or graphical form…and to make connections between the three forms.

Student Expectations to be successful in the AP Calculus AB course

Students will be prepared to learn each class. Student should be prepared:

- With materials and supplies.
- With assignments completed *on-time*.
- For Quizzes and Tests. There is a timeliness component ingrained into the course grade earned.
  (the next five items cannot be emphasized enough)
- To make mistakes and learn from them
- To make more mistakes and to continue learning from them
- To explore, to ask questions of the peers, to be questioned by their peers, to demand justification, to be required to justify, to struggle, to adapt and to grow as learners of mathematics and as people (instructor included ☺)
- To think critically
- To be challenged

Course Content

Unit #	Book Chapter	Primary Unit Focus	Secondary Unit Focus OR connections to world
1	1.2-1.5, 3.5, 2.1	A function & The derivative function, Limits	Continuity and Intermediate Value Theorem (IVT)
2	2.2-2.5, 3.2	Derivative Properties	Differentiability and Mean Value Theorem (MVT)
3	3.1, 3.3, 3.4	Extrema on intervals (closed and open)	First and Second Derivative Tests
4a	4.1, 4.2, 4.3, 4,4	Integration as an inverse function Integration graphical models	Fundamental Theorems of Calculus
4b	4.5	More complex Integrals (trig and U-substitution)	AP Integration Concepts
5	5.1, 5.2, 5.4, 6.1, 6.3	Other Functions (derivatives and Integrals of)	Separation of Variables with differential equations and Slope fields
6	2.6, 5.3, 5.6, 6.2, 8.7	Random ☺	Graphical Representations
7	7.1 and 7.2	Volume of a Solid formed by revolving a planar region	Area between two curves
AP Test Review		FRQ's	Short Answers
Post AP Test		Project	B.C. Topic Preview (parametric functions and polar functions)

The first Semester will encompass units 1 thru 4a. The second semester will encompass the rest.

AP Calculus (HeLa) Grading Scale:

Each component above will be assessed on the Standards Based Grading Scale. The letter grade earned will be according to the H.E.L.A. schoolwide adopted grading scale (table below).

A	3.20 – 4.00	B +	2.90 – 2.99	C +	2.40 – 2.49	D +	1.90 – 1.99	F	1.49 and below
A –	3.19 – 3.00	B	2.60 – 2.89	C	2.10 – 2.39	D	1.50 – 1.89		
		B –	2.50 – 2.59	C –	2.00 – 2.09				

Note: There will be no rounding at the end of the semester and no extra credit possibilities

Student Grades

Components of the Grade

The grade for each semester will be calculated by 4 components (each component is found in each unit).

First Semester

Prior Math Course Standards (Basic Skills Quizzes)	10%
Content Standards (Quizzes and Projects)	45%
Problem Solving Standards (Free Response Questions –FRQ's)	15%
Mastery of skills	30%

Second Semester

Prior Math Course Standards (Basic Skills Quizzes)	5%
Content Standards (Quizzes and Projects)	35%
Problem Solving Standards (Free Response Questions –FRQ's)	30%
Mastery of skills	30%

AP Test Information

- The AP test window this year is May 7th through May 18th.
- The AP Calculus AB test will be taken at 8:00am on Tuesday, May 15th (this is the 2nd Tuesday of the testing window). Information will be provided and posted on website regarding scholarships and free test options.
- To qualify for credit and/or placement in the calculus series at your University/College of choice, you will be required to achieve a score at minimum of a 3 on the AP test (the AP tests are scored a 1,2,3,4 or 5). You will want to check with your university/college as to their policies. Most will recognize a 3, some are more stringent (for example, M.I.T. and some Ivy League schools will require as high as a 5 to earn credit/placement).

This table represents how universities are likely to view your Calculus understandings based on the AP test score:

AP Score	Recommendation
5	Extremely well qualified
4	Well qualified
3	Qualified
2	Possibly qualified
1	No recommendation

- There will be extensive amount of test review options (all free) offered for the Calculus student at HeLa HS. Most review/practice sessions will be offered at HeLa HS in the afternoons (see the class website 'office hours' page) and with a minimal amount offered on Saturdays as we draw nearer the test date. The Evergreen School District has also worked with WSU-Vancouver to offer some Saturday AP sessions on Saturdays, these are called APConnect and more information will be offered for those sessions when the information is shared with Mr. Hanson.
- For the motivated and inquisitive student, a location with comprehensive and thorough information about all things AP can be found at collegeboard.com (follow the links to the AP sections and specifically the AP Calculus sections)
- If a student takes the AP test and earns a 3 or higher, by district policy the student will receive a full letter bump to their grade for both semesters. If the student receives a 5, they will receive a bump of 2 letter grades (maximum grade of an A or a 4.0)

Course Final for Calculus courses at HeLa HS

No Final is given or required in the AP Calculus AB or AP Calculus BC course. For both semesters the final will be replaced with retake possibilities on Problem Solving Standards (FRQ's) and/or the Mastery Component of the student's grade (Mixed Short answer questions).

The grade components (definitions and frequencies):

Grade Component	What it is	Frequency and time requirement
Prior Math Course Standards (Basic Skills Quiz)	Small quizzes which frequently assess skills students must recall from earlier math courses	Multiple times each unit (each Basic Skills Quiz will be 5 to 8 minutes)
Content Standards	Quizzes covering new material. Will be short answer format and composed of questions of varying complexities and problem solving requirements. Content of questions will be known and questions clearly grouped by standard. No assessment of previous units / standards.	2 to 3 per unit Lasting 20 to 30 minutes and will encompass 1 to 3 skills (scored and recorded separately)
Problem Solving Standard (FRQ's)	The Free Response Questions (FRQ's) are multipart questions which, besides requiring deep understanding of the content, will also assess a student's ability to reason, think critically and to justify their responses. The FRQ's taken during class will be close facsimile's to the FRQ's you will be required to take on this year's AP test and will be graded as if they were being according to the AP supplied rubrics. (students will not see the rubric prior but will have seen numerous rubrics for similar styled questions)	FRQ's are given once per unit at the end of the unit. (Each unit test typically has 2 Free Response Questions: 1 new topic and 1 previous topic. Each FRQ is allotted 15-20 minutes*) *The AP test only allows 15 minutes (on average) for each FRQ.
Mastery of Skills	Mastery assessments are provided at the end of each Unit. Mastery assessments are short answer questions (of varying complexities) from the current unit and any previous units.	Mastery Assessments are once per unit and usually 10 - 12 questions with 3ish minutes allotted per question (30 minutes total).

Reassessments (Retakes)?

It is recognized that life happens and is not always able to be scripted to our liking. With this recognition, it is understood that sometimes a student will be unhappy with their performance on a quiz or test and seek an opportunity to further demonstrate their learning after a quiz or test is complete.

Following (on the next page) is the comprehensive guide for reassessment for each type of student work:

Reassessment (Retake) Policies, requirements and timeframes

Component	Reassessment (Retake) Policy	Additional requirements for reassessments	Timeframe for reassessment
Prior Math Standards (Basic Skills Quiz)	Students can retake any basic skills Quiz one time. *Score (SBG) will be averaged and rounded up.	none	Within one week of Basic Skills Quiz being returned. Must be scheduled a minimum of 1 day prior and taken prior to school on Tuesday's.
Content Standards	Students can retake any Content Skill one time. *The retake grade will replace the original grade regardless of result. **Students will be allowed a total of 2 second retake possibilities per semester	Home-practice-work will be checked and scored for effort/completion. Though home-practice-work will not affect the student's grade, home-practice-work will affect the ability to retake. Home-practice-work completed at a level of 100% (a packet for each content quiz) will allow for 1 retake for that Content quiz. **each second retake will require an assignment and/or a student/teacher tutorial/conference.**	Within one week of the Content Quiz being returned. Must be scheduled a minimum of 1 day prior and taken outside of class time. (The same is true for a second retake if/when you opt to use one of your 2 second retake options.)
Project(s)	None – It is up to students to schedule time for feedback prior to turning in finished projects (a rubric will be provided for each project)	Project grades are final	None
Problem Solving Standard (FRQ's)	For each unit, the FRQ grade will be comprised of 2 FRQ's on the content topic. One will be taken at the end of the unit. The second will be taken at the end of the *next* unit. The two scores will be averaged. *Two retake options will be possible for each unit's FRQ scores. -The first retake replaces the lower of the 2 FRQ scores for the unit. -The second retake *averages* with the lowest of the 2 FRQ scores of record.	None – though scheduling a teacher conference prior to retake to ensure understanding is recommended.	The 1st and 2nd retakes will be given at predetermined times (typically spanning a two day period) If the retake window is missed, the retake option evaporates.
Mastery	None – Though if a student can demonstrate (at the end of the year) that a score on any unit's mastery assessment is an *outlier* when compared with the others, that specific mastery assessment will be dropped for the student.	Student must demonstrate with statistical analysis that a score for a mastery assessment is an outlier. (by definition, an outlier is an unlikely occurrence and is guaranteed to happen a maximum of one time)	Analysis must be complete (and correct) and turned in prior to the sitting for the final.

Calculus AB
Signature page

I have read and understand the previous pages policies and definitions. I understand that if something is unclear it is upon the student to seek clarification prior to the occurrence of an issue during the school year.

I understand the following supplies will be needed daily:

- A pencil (student work completed in pen will not be graded)
- Lined paper free of torn spiral edges. (graph paper may be useful)
- A Ti-83+ calculator at a minimum (recommended students obtain a Ti-84+, the Ti-84+ will be the calculator used by the instructor for demonstrations and is the calculator heavily recommended for the A.P. Tests (Calculus AB, Calculus BC and/or Statistics)
- A different colored 'grading' pen is recommended for students to identify clearly which practice questions were missed and, thus, which type of questions may need further study.
- It is recommended students have a separate 3 ring binder with 10 to 12 dividers for their math class. At a minimum a separate section in their binder for math, though it is felt this will be insufficient and impossibly difficult to organize as a reference for the final and for mastery assessments.
- A Positive attitude
- A willingness to make mistakes...and learn from them! (these are the best learning opportunities)

Students, please sign and date the following and have your parent/guardian do the same.

Student Name (printed neatly)_____

Student Signature _____

Parent/Guardian Name (please print neatly)_____

Parent/Guardian Signature_____

Date_____

****Students, your first Basic Skills Quiz score will be based on your completion of and timely turn-in of the following items (this is the only time a score will be entered which is not math work).****

Five Items (to be stapled in this order) DUE: Friday, September 8th

1. Student information sheet (filled out by student)
2. This signed syllabus sheet (please remove this page and keep the other pages for your reference)
3. An email sent to instructor with a question regarding the class (email to neil.hanson@evergreenps.org)
4. Student has signed up for REMIND [if a parent disagrees or is hesitant on this requirement, please email Mr. Hanson (prior to the due date for this packet) and this requirement will be waived.]
5. The predetermined printed page from the website (www.scubamoose.weebly.com) It is recommended that students add this website as a favorite for their browser.

Grade: 0.0 (not turned in) 1.0 (syllabus signature returned) 2.0 (syllabus & 2 other items completed)
3.0 (Syllabus and 3 other items returned) 4.0 (all items returned)

For each day the packet is late (class scheduled or not), the score will decrease 0.5 per day. Students CAN turn in early.