

## Deer Valley Unified School District No. 97

sdohs.dvusd.org



Course:AP Calculus ABTeacher:Cindy KnollRoom:616

E-mail: cindy.knoll@dvusd.org Voice Mail: 623.455.7259 Web Page: http://www.dvusd.org/so-knoll

### **Mission Statement:**

The SOHS math department will ensure that all students will increase their competency in Math through quality instruction and collaboration.

### Mathematical Practices for AP Calculus AB Mathematical Practices:

### 1. Reason with definitions and theorems

- a. Use definitions and theorems to build arguments, to justify conclusions or answer to prove results;
- b. Confirm that hypotheses have been satisfied in order to apply the conclusion of a theorem;
- c. Apply definitions and theorems in the process of solving a problem;

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- d. Interpret quantifiers in definitions and theorems.
- e. Develop conjectures based on exploration with technology; and
- f. Produce examples and counterexamples to clarify understanding of definitions, to investigate whether converses of theorems are true or false, or to test conjectures.

### 2. Connecting concepts

- a. Relate the concept of a limit to all aspects of calculus;
- b. Use the connection between concepts or processes to solve problems;
- c. Connect concepts to their visual representations with and without technology; and
- d. Identify a common underlying structure in problems involving different contextual situations.

### 3. Implementing algebraic/computational processes

- a. Select appropriate mathematic strategies;
- b. Sequence algebraic/computational procedures logically;
- c. Complete algebraic/computation processes correctly;
- d. Apply technology strategically to solve problems;
- e. Attend to precision graphically, numerically, analytically, and verbally and specify units of measure; and
- f. Connect the results of algebraic/computational processes to the question asked.

### 4. Connecting multiple representations

- a. Associate tables, graphs and symbolic representations of functions;
- b. Develop concepts using graphical, symbolical, verbal or numerical representations with or without technology;
- c. Identify how mathematical characteristics of functions are related in different representations;
- d. Extract and interpret mathematical content from any presentation of function;
- e. Construct one representational form from another; and
- f. Consider multiple representations of a function to select or construct a useful representation for solving a problem.

### 5. Building notation fluency

- a. Know and use a variety of notations;
- b. Connect notation to definitions;
- c. Connect notation to different representations; and
- d. Assign meaning to notation, accurately interpreting the notation in a given problem and across different contexts.

### 6. Communicating

- a. Clearly present methods, reasoning, justifications and conclusions;
- b. Use accurate and precise language and notation;
- c. Explain the meaning of expressions, notation, and results in terms of a context;
- d. Explain the connections among concepts;
- e. Critically interpret and accurately report information provided by technology; and
- f. Analyze, evaluate and compare the reasoning of others.

### **Concept Outline**

#### **Big Idea 1: Limits**

#### EU1.1 The concept of a limit can be used to understand the behavior of functions

- Express limits symbolically using correct notation.
- Interpret limits expressed symbolically.
- Estimate limits of functions.
- Determine limits of functions.
- Deduce and interpret behavior of functions using limits.

#### EU 1.2 Continuity is a key property of functions that is defined using limits.

- Analyze functions for intervals of continuity or points of discontinuity.
- Determine the applicability of important calculus theorems (IVT, EVT, and MVT)

#### **Big Idea 2: Derivatives**

### EU 2.1: The derivative of a function is defined as the limit of a difference quotient and can be determined using a variety of strategies.

- Identify the derivative of a function as the limit of a difference quotient.
- Estimate derivative.
- Calculate derivatives.
- Determine higher order derivative.

### EU 2.2: A function's derivative, which is itself function, can be used to understand the behavior of the function.

- Use derivative to analyze properties of a function.
- Recognize the connection between differentiability and continuity.

### EU 2.3: The derivative has multiple interpretations and applilcations including those that involve instantaneous rates of change.

- Interpret the meaning of a derivative within a problem.
- Solve problems involving the slope of a tangent line.
- Solve problems, involving related rates optimization, rectilinear motion.
- Solve problems involving rates of change in applied contexts.
- Verify solutions to differential equations.
- Estimate solutions to differential equations.

### EU 2.3: The Mean Value Theorem connects the behavior of differentiable function over an interval to the behavior of the derivative of that function at a particular point in the interval.

• Apply the Mean Value Theorem to describe the behavior of a function over an interval

#### Big Idea 3: Integrals and the Fundamental Theorem of Calculus

#### EU 3.1: Antidifferentiation is the inverse process of differentiation.

• Recognize antiderivatives of basic functions.

### EU 3.2: The definite integral of a function over an interval is the limit of a Riemann sum over that interval and can be calculated using a variety of strategies.

- Interpret the definite integral as the limit of a Riemann sum.
- Express the limit of Riemann sum of integral notation.
- Approximate the definite integral.
- Calculate a definite integral using areas and properties of definite integrals.

### EU 3.3: The Fundamental Theorem of Calculus, which has two distinct formulations, connects differentiation and integration.

- Analyze functions defined by an integral.
- Calculate antiderivatives.
- Evaluate definite integrals.

### EU 3.4: The definite integral of a function over an interval is a mathematical tool with many interpretations and applications involving accumulation.

- Interpret the meaning of a definite integral within a problem.
- Apply definite integrals to problems involving the average value of a function.
- Apply definite integrals to problems involving motion.
- Apply definite integrals to problems involving area and volume.

# EU 3.5: Antidifferentition is an underlying concept involved in solving separable differential equations. Solving separable differential equations involves determining a function of relation given its rate of change.

- Analyze differential equations to obtain general and specific solutions.
- Interpret, create and solve differential equations from problems in context.

(See <u>https://secure-media.collegeboard.org/digitalServices/pdf/ap/ap-calculus-ab-and-bc-course-and-exam-description.pdf</u>)

### **Grading Policy**

- A = 90-100%
- B = 80-90%
- C = 70-79%
- D = 60-69%
- F = below 60%
- Grades are cumulative for each semester.
- The 18-week grade which comprises 80% of your overall course grade are as follows:
  - Summative Tests/Projects 90% Classwork/Practice 10%
- The final exam will account for 20% of the semester final grade.
- No extra credit will be accepted.

### **Powerschool Access**

The Powerschools site allows parents/guardians and students to access the student's grades, attendance, and other information. If you need your access information, please stop by the front desk during business hours. You will need a photo I.D. The web address is: ps.dvusd.org/public

### AP Exam Testing

*It is the expectation that all students take the AP Calculus AB exam.* All students will take a complete practice exam. This practice exam will be scheduled in advance and participation is mandatory as this is part of your final exam for the course.

All students, whether testing for Advanced Placement College Board credit or not, will sit for a full board exam on *Tuesday, May 9, 2017*. Students testing for college credit will test with the appropriate facilitator. Students testing as their final exam will test with Mrs. Knoll. Exam check-in for all students is at 7:40 am and students will miss their 1-3 hour classes that day (as an excused internal school absence that will not count as an absence for school attendance policy purposes {code 8}). Participation in this exam date is not optional.

### Test Make-up/Test Grade Recovery Policy

Tests: You must take tests the day they are given. An absence the day before the test will not excuse you from the test. Tests missed due to an absence must be made up within one week of the original test date. If a student is absent on the day of a test, the student is required to take the exam on the day of the return. It is the student's responsibility to make the teacher aware. Failure to do so will result in a zero on the exam. Please contact me if there are extenuating circumstances. Students may be allowed to recover from a poor performance on a test at the teacher's discretion if they have completed all of their homework prior to the test. Students must meet with the teacher to discuss the particulars of the test recovery.

### Make-Up Work

Upon return to class after an absence, a student has one school day for each day missed to make up work/test assigned during his/her absence regardless of the number of days absent. For example, if a student is absent on Thursday and Friday, he/she will have Monday and Tuesday of the following week to make up work and must turn in the work that was assigned during the days absent on Wednesday. It is the student's reponsibility to check Canvas Learning Management System for any work missed. Teachers may choose to schedule an appointment with the student to formulate a plan for the completion of make-up work.

Coursework and assessments assigned prior to the absence(s) may still be <u>due on the date assigned or due on the first</u> <u>day that the student returns to class</u>.

Make-up work for extended absences can be accessed on Canvas (LMS) or requested through the Counseling Office and picked up there.

### Late Work Policy

Late work will be accepted for partial credit up until the unit test is administered. Note: No revised work and/or retakes will be permitted during the last two weeks of a semester.

### Long Term Project Policy

Long term projects are due on the date and time assigned, as defined in writing in advance by the teacher. NO EXCEPTIONS. THIS SUPERSEDES THE MAKE-UP POLICY. If the student is absent or the class does not meet that day, the PROJECT IS STILL DUE ON THE DAY ASSIGNED.

### **Classroom Behavior Expectations**

- Be prepared to work quietly when the bell rings.
- Be polite and respect the rights of yourself and others.
- Be quiet when others are speaking.
- Be active participants in the learning process.
- Take responsibility for you actions.
- Do your personal best.

### **Electronic Device Use**

Technology (cell phones, iPods, hand-held devices, etc.) use in the classroom is intended to **enhance** the learning environment for all students; however, any use of technology that substantially degrades the learning environment, promotes dishonesty or illegal activities, is prohibited. If the instructor determines that the use of technology is a distraction to the learning process, either of the student using the technology or to those around him/her, the student may, at the discretion of the teacher, be asked to discontinue the use of technology in the classroom.

### Personal Electronic Device Use

Personal Electronic Devices include cell phones, iPods, other mp3 players and similar technology devices **used for entertainment and communication/social media**. Students are expected to refrain from the use of electronic devices for personal entertainment and/or communication (i.e email, instagram, facebook, etc.) during instructional time (as determined by the teacher or classroom designee). While students may freely use these devices before and after school, during passing period, and at lunch- the teacher will limit the use of personal devices and for which purposes during class to ensure that *all students are focused and ready to learn*.

### iPads and the Use of Electronic Devices to Facilitate Learning:

Sandra Day O'Connor High School will begin to integrate the use of tablets, laptops and smart phones **as a learning tool** in the classroom. Once the technology tools are added to the classroom for <u>learning</u>, the classroom teacher will inform students as to when they may use their device and for which purposes. Students must adhere to their teacher's guidelines for use and appropriate times for use. Any student who violates the teacher's guidelines will be subject to disciplinary action.

Please note- students may <u>not</u> access their personal devices, whether for entertainment or learning, if the teacher has stated that the classroom activities at that time do not warrant use. For example, during testing or assessments.

### Adherence to the O'Connor Academic Integrity Code

All students enrolled in AP Calculus AB will adhere to the framework and guidelines set forth in the O'Connor High School Academic Integrity Code. Cheating and Plagiarism will not be tolerated. **The purpose of this code is to promote a positive learning environment for all involved.** As humans, we will make mistakes as we grow. It is understood that we can learn from those mistakes and become better individuals in the future. Any student who violates this code will be referred to the Students Rights and Responsibilities handbook and assignment of appropriate consequences.

### Plagiarism and Cheating

**<u>Cheating</u>**: In cheating, a student is taking the work of another, on any assignment, and claiming it as his/her own. At SDOHS cheating includes but is not limited to:

- Copying and/or offering homework verbally, in written form, or by electronic means from/to another student.
- Copying and/or offering questions and/or answers on tests or quizzes verbally, in written form, or by electronic means from/to another student.
- Pressuring other students to copy and/or offer homework, answers and/or questions on tests or quizzes verbally, in written form or by electronic means.
- Bringing in and using unauthorized information during class time, including information stored in any electronic device.
- Offering or receiving information under circumstances in which information is not to be shared.
- Having anyone, including parents or tutors, complete assignments and submitting the work as one's own.
- Presenting collaborative work as independent work and independent work as collaborative. (In group work, one person should not and will not bear the burden for the entire group assignment.)
- Copying answers from answer guides in texts.
- Fabricating data, information, or sources. Presenting made up material as authentic.

**Plagiarism:** The act of plagiarism may include direct copying, but it may also be more complex than verbatim repetition. A student, in preparing a project for a class, will have plagiarized if he/she has taken information from sources without citing the sources that have been used. Plagiarized material may appear in a student's paper as word-for-word copying, a summation, or a paraphrase of another's ideas. A student has plagiarized whether the material from another source has been taken in whole or in part. In effect, by not naming the source, the student is claiming the work of another as his/hers. At SDOHS plagiarism includes but is not limited to:

- Submitting images and/or documents in whole or in part from the Internet without citation of the source(s).
- Copying another's work.
- Using another's ideas without proper citations.
- Incorporating portions of another's writing within the context of your own work.
- Failing to acknowledge a source of information.
- Using "unique" phrases without citations.
- Using graphics, charts, diagrams, or illustrations without citations.
- Using a translator (either in-person or on-line) without proper citations

Plagiarism and/or Cheating will result in disciplinary actions and a 0%, with no option to redo/retake. - no exceptions.

#### Loss of Credit Due to Absences

Upon reaching 5 unexcused absences or a combination of 12 unexcused and/or excused absences, a student may **lose credit** in any given class.

Any student may be placed on an Attendance Contract upon accumulating multiple excused and unexcused absences. Any student with excessive absences may:

- 1. Lose credit in one or more classes.
- 2. Lose parking privileges.

### Communication

Please contact the teacher for any student concerns. It is crucial that teachers, parents, and students maintain open lines of communication in order to ensure the best support for student success. Contact information is provided at the top of the first page of this syllabus.

The Deer Valley Unified School District does not discriminate on the basis of race, color, national origin, sex, disability, or age in its programs and activities. For any inquiries regarding nondiscrimination policies contact the Superintendent's Department, 20402 N. 15th Avenue, Phoenix, AZ 85027. 623.445.5000.