## Multivariable Calculus 3 Honors Course Syllabus

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Room \#: E121
Class Meeting Time: $1^{\text {st }}$ Period
Conference Period: 4 ${ }^{\text {th }}$ Period

Tutorial Times: You will be working together in class on a regular basis. This will be tutorial times for you. There will be lots of time in class for you to work together and master the material.
BC Calc @ $3^{\text {rd }} / 6^{\text {th }} \quad$ AB Calc @ $2^{\text {nd }} / 5^{\text {th }} \quad$ AP Pre-Calc @ $7^{\text {th }}$

## Resources and Materials:

- Textbooks: Primary - Larson, Calculus, $8^{\text {th }}$ edition
- TI-89 Graphing Calculator (provided, BRING EVERY DAY)
- Organized binder (MATH only) with COLLEGE-RULED paper and dividers (lesson and assignment schedules, handouts, homework, lessons, all text example problems worked out, enrichment presentations, quizzes)
- PENCILS (all work is to be done in pencil), as well as a pen (for corrections on homework)


## Course Description/Objectives:

- Overview: Calculus is a study of change incorporating all previously studied math concepts.
- Content:
- Vectors and the Geometry of Space - $1^{\text {st }}$ Six Weeks
- Vectors in the Plane, Space Coordinates and Vectors in Space, The Dot Product of Two Vectors, The Cross Product of Two Vectors in Space, Lines and Planes in Space, Surfaces in Space, Cylindrical and Spherical Coordinates
- Vector-Valued Functions - $2^{\text {nd }}$ Six Weeks
- Vector-Valued Functions, Differentiation and Integration of Vector-Valued Functions, Velocity and Acceleration, Tangent Vectors and Normal Vectors, Arc Length and Curvature
- Functions of Several Variables - 3rd Six Weeks
- Limits and Continuity, Partial Derivatives, Differentials, Chain Rules for Functions of Several Variables, Directional Derivatives and Gradients, Tangent Planes and Normal Lines, Extrema of Functions of Two Variables and Applications, Lagrange Multipliers
- Multiple Integration - $4^{\text {th }}$ Six Weeks
- Iterated Integrals and Area in the Plane, Double Integrals and Volume, Change of Variables: Polar Coordinates, Center of Mass and Moments of Inertia, Surface Area, Triple Integrals and Applications, Triple Integrals in Cylindrical and Spherical Coordinates, Change of Variables: Jacobians
- Vector Analysis - 5 $^{\text {th }}$ Six Weeks
- Vector Fields, Line Integrals, Conservative Vector Fields and Independence of Path, Green's Theorem, Parametric Surfaces, Surface Integrals, Divergence Theorem, Stoke's Theorem
- Additional Topics - 6 ${ }^{\text {th }}$ Six Weeks
- TBD
- Instructional methods: brief lectures some days, discovery and group work. Students will present each section in teams. The class will be seminar-style and students will be responsible for the depth and richness of this course.
- Goals: critical reading, analytical thinking, creative synthesis and problem-solving, and attention to detail regarding all SingleVariable and Multi-Variable Calculus topics, and beyond
- Objective: preparation for college options
- Major work: Homework, Quizzes, Enrichment Presentations, Class Participation, AB/BC Calculus Tutorials, Exams


## Course Calendar/Schedule:

- Assignments: Homework, Presentations, as stated on assignment schedule
- Due dates:
- Homework is due the class following the lesson!!! If you do not have it, you are not ready for the next material to be discussed
- Quizzes will usually be unannounced - be prepared at any time for an evaluation of your progress
- Exams as stated on the assignment syllabus $\rightarrow$ DO YOUR BEST NOT TO MISS AN EXAM!!! As Exams will be in a group activity, your absence from one will require you to take your exam without the benefit of collaboration with your peers.


## Course Policies:

- Attendance:
- Be proactive regarding your education: contact your peers to learn what you have missed. It is critical that you become an independent learner. The majority of our collaborative learning will be done in class, so it is best if you are IN class! If you know prior to missing a class that you will be absent, make a plan for staying ahead.
- Attending class must be a priority.


## - Tardies:

- Please make every effort to be on time to class.
- You are tardy if you arrive after the tardy bell has rung, and you are absent if you arrive more than 10 minutes after the tardy bell has rung (school policy). Quizzes will usually begin as soon as the tardy bell rings.
- Since this class is the $1^{\text {st }}$ one of the day, I encourage you to get to school earlier than you think you need to be here!


## - Class Participation:

- You will regularly present work on the board and work cooperatively with your peers. It is the one thing we do that will help you learn. We celebrate learning from making mistakes! This is where you learn to think for yourself.
- This class will run less like a lecture-based course, and more like a seminar course. You will need to learn how to READ a math textbook, work all examples in the text and work independently to begin to understand the concepts that comprise this curriculum. You will participate with your peers as you master the material together. You will also work in teams at the end of each chapter to create and give presentations on applications of the topic learned.
- Make-ups:
- The purpose of Learning Opportunities (i.e., "homework") is to help you become comfortable with course material, concepts and skills, as well as to prepare you for the new material discussed that day. If you have not done it, you are not ready to learn. There is no make-up work that can replace missing or incomplete assignments.
- If you are absent on Test day, please contact me via email prior to your class' exam so we can reschedule your exam. If you know prior to a test that you will be absent, please make arrangements with me ahead of time to re-schedule your exam, since you will be missing a collaborative activity, and you will not have a collaboration group!! Please try to avoid being in this predicament.
- Re-Tests: Calculus 3 is a college-level course and there are no such things as "re-tests" in college. Honestly, if you are working as you should in class and are prepared each day, and can contribute to class activities regularly, you will perform fine on each test. Worry about learning. Let me worry about your grade.


## - Cheating:

- If you cannot explain your work that you bring to class, it will be clear that you did not do your work yourself. If you have done the work YOURSELF (i.e., you have not had a tutor coach you through it, nor have copied it from someone else or some outside resource), you will know what you did and be able to explain it to others. I expect you to work together on almost everything, because this is how you learn. You know when you have crossed the line.
- If you discuss any part of a quiz or test with a peer who has not yet taken it, YOU ARE CHEATING.
- Other examples of cheating include, but are not limited to: copying someone's homework or in-class assignments, copying work/answers from the internet, letting someone copy your work, having someone else's homework paper, using a cheat sheet for a quiz or test, etc.
- Trust is very difficult to rebuild. Please do not put yourself in this position with me. No grade is worth it.
- Tutorials:
- As Calc 3 students, you have the advantage of having completed BC Calculus (college equivalent of Calculus I and Calculus II), and are uniquely qualified to tutor the AB and BC Calculus students. This activity will not only help you maintain your Calc I and Calc II skills, but also will be most beneficial for you when you get to college. You will be able to apply for employment at your on-campus math tutoring center since you will have tutored AB and BC students all year, qualifying you to tutor College Algebra, Trig/Pre-Calc, Calc I and Calc II. This is a great opportunity for you as you prepare for your college experience. You will serve at least one $45-\mathrm{min}$. session per week (lunch-time event).


## - Expected Behavior:

- Being kind and encouraging.
- Having respect for instructor, peers and yourself.
- Exhibiting honesty, integrity, and exemplary character.
- Participating in classroom activities.
- Completing all homework assignments; review the next lesson prior to attending class.
- Using PENCIL for homework, quizzes and tests.
- Being present and on time to class with all necessary supplies.
- Participating in independent study groups (the first step to academic success and excellence).
- Serving your tutorial sessions punctually and regularly at designated times.
- Carrying your weight as you work in groups for the class, especially in the Chapter Presentation Projects.
- Utilizing various resources which will help you better understand the material.
- Leaving Mrs. Doxtater's stuff in the same or better condition in which you found it.
- Handling your concerns with maturity and responsibility $\rightarrow$ please communicate with me prior to allowing a problem (academic or personal) get out of hand - I expect to know from you first if there is a problem or area of concern. Please do not depend on your parents to solve your problems!! You must develop mature independence and learn how to properly advocate for yourself so that you can do it when you get to college, and I am here to help you do that!!!
- Unacceptable Behavior:
- Using profanity (verbal, physical, symbolic or written).
- Cheating in any form (including copying homework).
- Being disrespectful, inconsiderate or generally surly.
- Sleeping in class.
- Not taking care of this space (trash, writing/gum on desks, etc.)
- Having incomplete or non-existent homework assignments.
- Being absent from class, especially if there is a recurrence, or pattern, on test days.
- Removing anything from the classroom which is not yours.
- Asking if there is any extra credit work you can do to "bring up your grade." Use your class time well to learn!
- Grade grubbing: disputing each point on a graded activity. I put a great amount of time into both creating and assessing all quizzes and tests, as well as the very occasional graded homework.
- Telling me that you must have a "[fill in the grade]" for admission to a particular university, or college program, or for a scholarship. It is your responsibility to be in my room regularly, mastering the course material if this is a concern for you. Please do not ask me to give you this necessary grade when you have not earned it as this calls into question my integrity as an Instructor.
- Grades:
- Overall Six Weeks Average determined by:
- Homework/Boardwork/Classwork 10\%
- Lesson Presentation/Quizzes/CalPAL 20\%
- CalPAL: Calculus 3 students have a unique advantage over all other math students at WHS. Besides having the opportunity to take a Multivariable Calculus course while in high school, you will have a greater understanding of how important the topics from $A B$ and $B C$ Calculus are than you had while taking $B C$, and you are uniquely equipped to belp guide students in those courses. You will be available for hands-on tutoring as scheduled (according to your availability and student need) during lunch each week.
- Exams/Enrichment Presentations 70\%
- Enricbment Presentations: At the end of each unit (approximately the last 1.5 weeks of each 6 -weeke cycle), students will work in teams to research and present real-world applications of the topics most recently studied.
- Bonus Opportunities:
- $100 \%$ attendance and participation on Exam days: 1 pt. earned on the Exam

Students will be issued a TI-89 Calculator and a textbook for the course, to be returned at the end of the year. If either of these is lost or damaged, you are expected to replace it prior to the end of the school year or grades will be held. You are expected to provide replacement calculator batteries, as needed.

## After reading the Syllabus, please sign below, and have your parent/guardian sign below, and return this form to Mrs. Doxtater. Please keep the Syllabus in your class binder/notebook.

"We have read and understand the Calculus 3 Course Syllabus, and the textbook/calculator policy."
Student Name (printed): $\qquad$ Class Period: $\qquad$
Student Signature: $\qquad$ Date: $\qquad$
Parent Signature: $\qquad$ Date: $\qquad$
Parent email: $\qquad$
Please return to Mrs. Doxtater
If possible, please donate: Kleenex, AAA Batteries, Expo Dry Erase Markers, Hand Sanitizer

