Mathematics Department Emad Abu-Hakmeh

West Orange High School Math Supervisor 6-12

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**MATH 0802 – CALCULUS**

**Course Syllabus**

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**INSTRUCTOR:** Mr. Jonathan Tick **E-MAIL:** [jtick@westorangeschools.org](mailto:jtick@westorangeschools.org)

**ROOM NUMBER:** 3218 **PHONE:** 973-669-5301 ext. 33289

**Academic Integrity Code**

All students should be aware that the Department of Mathematics at West Orange High School strictly enforces an Academic Integrity Code similar to the one enforced by NJIT. Both WOHS and NJIT emphasize that there must not be any forms of plagiarism, i.e., copying of homework, class projects, or any assignments, or any form of cheating on quizzes and exams. Under the Code on Academic Integrity, students are obligated to report any such activities to the instructor.

**COURSE INFORMATION**

Full Year - 5 Credits Offered in Grades 11-12 Prerequisites: Pre-calculus

The course will provide opportunities for learners to practice the principles of modeling and problem solving skills, and prepare them for advanced studies in the area of calculus and applied mathematics. It will develop understanding of: modeling and problem solving skills using calculus, the derivative at a given point on the graph of a curve as the slope of the tangent line at that point, the integral of a given function over given boundaries as the area under the curve within the boundaries, the elementary theorems of calculus to find derivatives and evaluate integrals of linear, exponential, rational, and trigonometric functions. A wide range of TI-89 graphing calculator activities will be utilized throughout the course to model and solve real-life applications using the principles of calculus.

**REQUIRED TEXTBOOK**

Title: Thomas' Calculus: Early Transcendentals

Author: Thomas

Edition: 13th

Publisher: Pearson

ISBN #: 978-0321981677

**COURSE GOALS**

**Objectives**

Students will:

* learn about limits and their central role in calculus
* learn about derivatives and their relationship to instantaneous rates of change
* understand many practical applications of derivatives
* gain experience in the use of approximation in studying mathematical and scientific problems
* learn about integrals, their origin in area problems, and their relationship to derivatives
* gain an appreciation for the importance of calculus in scientific, engineering, computer, and other applications
* gain experience in the use of technology to facilitate visualization and problem solving

**Outcomes**

Upon successful completion of this course, students will:

* have improved logical thinking and problem-solving skills
* have a greater understanding of the importance of calculus in science and technology
* be prepared for further study in mathematics as well as science, engineering, computing, and other areas

**Course Assessment**

The assessments used in the course will include class participation, homework assignments, projects, quizzes, unit assessments, and cumulative/comprehensive performance assessments.

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**POLICIES**

* All school policies as stated in the student handbook will be strictly enforces.
* Attendance is mandatory. Please make sure you read and fully understand the West Orange High School Attendance Policy. This policy will be strictly enforced.
* All cell phones and other electronic devices must be turned off during all class times.

**Grading Policy**

The final grade for each marking period will be determined as follows:

Homework 10%

Class Participation 5%

Quizzes (including collected warm up, exit cards, etc.) 15%

Major Assessments (Unit assessments, projects, etc.) 55%

Comprehensive Performance Assessment 15%

Your final letter grade for each marking period is indicated in the key below:

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A+** | **97-100** | **B+** | **87-89** | **C+** | **77-79** | **D+** | **67-69** | **F** | **0-59** |
| **A** | **93-96** | **B** | **83-86** | **C** | **73-76** | **D** | **63-66** |  |  |
| **A-** | **90-92** | **B-** | **80-82** | **C-** | **70-72** | **D-** | **60-62** |  |  |

**Late assignments and Makeup Policy**

* No late assignments will be accepted.
* There will be NO MAKEUP QUIZZES OR EXAMS.
* In the event an assignment is not submitted on time or an exam is not taken under rare circumstances where the student has a legitimate reason for missing the exam, the student should contact his/her school counselor and present written verifiable proof of the reason for missing the exam, e.g., a doctor’s note, police report, etc. clearly stating the date AND time of the mitigating problem. The student must also notify the instructor that the exam will be missed.

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**ADDITIONAL RESOURCES**

* Math Honor Society tutoring is available throughout the year; please talk to your teacher.
* Teachers are available Tuesdays – Thursdays for 30 minutes after dismissal. Make sure you arrange with your teacher for additional help.
* For further questions, students should contact their instructor.
* All students must familiarize themselves with and adhere to the Department of Mathematical Course Policies, in addition to official school-wide policies.
* The Department of Mathematics takes these policies very seriously and enforces them strictly.

**Accommodation of Disabilities**

West Orange High School is committed to providing students with documented disabilities equal access to programs and activities. Students with a written 504 and/or IEP will be provided with the all accommodations as specified in their individual educational plan.

**Course Outline**

**First Marking Period**

*1. Chapter 1: Functions*

* 1.1 Functions and Their Graphs
* 1.2 Combining Functions: Shifting and Scaling Graphs
* 1.3 Trigonometric Functions
* 1.4 Graphing with TI-89
* 1.5 Exponential Functions
* 1.6 Inverse Functions and Logarithms

*2. Chapter 2: Limits and Continuity*

* 2.1 Rates of Change and Tangents to Curves
* 2.2 Limit of a Function and Limit Law
* 2.4 Limit of a Function and Limit Law
* 2.5 Continuity
* 2.6 Limits Involving Infinity; Asymptotes of Graphs

**Second Marking Period**

*3. Chapter 3: Derivatives*

* 3.1 Tangents and the Derivative at a Point
* 3.2 The Derivative as a Function
* 3.3 Differentiation Rules
* 3.4 The Derivative as a Rate of Change
* 3.5 Derivatives of Trigonometric Functions
* 3.6 The Chain Rule
* 3.7 Implicit Differentiation
* 3.8 Derivatives of Inverse Functions and Logarithms
* 3.9 Inverse Trigonometric Functions
* 3.10 Related Rates
* 3.11 Linearization and Differentials

**Third Marking Period**

*4. Chapter 4: Application of the Derivatives*

* 4.1 Extreme Values of Functions
* 4.2 The Mean Value Theorem
* 4.3 Monotone Functions and the First Derivative Test
* 4.4 Concavity and Curve Sketching
* 4.5 Indeterminate Forms and L'Hôpital's Rule
* 4.6 Applied Optimization
* 4.7 Newton's Method
* 4.8 Antiderivatives

**Fourth Marking Period**

*Chapter 5: Integrals*

* 5.1 Area and Estimating with Finite Sums
* 5.2 Sigma Notation and Limits of Finite Sums
* 5.3 The Definite Integral
* 5.4 The Fundamental Theorem of Calculus
* 5.5 Indefinite Integrals and the Substitution Method
* 5.6 Definite Integral Substitution and Area between Curves