Business Calculus CHS

Room 228

Mr. Yarnot

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Ext. 1678

Textbook: Larson/Edwards Calculus: An Applied Approach Ninth Edition (Houghton Mifflin Company)

There is a $185 charge for a lost or damaged textbook

Course Description:

This course employs the fundamental tools of algebra and geometry in order to lay a foundation for calculus. Limits, continuity, derivatives and integration are studied as well as application. Emphasis is placed on basic formulas and understanding concepts as opposed to problem solving. Problems are approached algebraically and graphically. Fundamentals of algebra are reviewed as necessary throughout the course. This course is designed for students in business, economics and social sciences. Proficiency in algebraic manipulation is essential.

University of Pittsburgh Credit

This course is being offered in association with the University of Pittsburgh's College in High School program in order to receive 4 college credits for this course. The cost for the course is $235.

Registration Deadline: October 1st, 2016*

Grading:

Two grades will be issued for this class (if you have enrolled for Pitt Credit)

Shaler Area Grade

9 Week Grade		Final Grade	
Quizzes	90%	1st 9 Weeks	20%
(Checkpoint Quizzes,		2nd 9 Weeks	20%
Section Quizzes, Unit Exams)		Midterm Exam	10%
		3rd 9 Weeks	20%
Homework	10%	4th 9 Weeks	20%
		Final Exam	10%

Quizzes and Tests:

Quizzes (20-35 points) will typically cover 1-3 lessons while tests (40-55 points) will be given at the end of units. Questions can consist of a mix of short answer and multiple choice responses. There may also be mini-quizzes (5 points) given periodically as formative assessments throughout the course of the year.

Homework:

Homework will be assigned throughout the year (1-4 times per week) and will be checked for completion. All work and answers are to be shown. All homework answers will be reviewed on the day the assignment is due and any questions will be answered.

Tutoring:

The high school offers mathematics tutoring during each period of the school day from members of the high school math department. For an updated list of teachers by period and location, please check the bulletin board in the classroom.

Absences:

Students are responsible for obtaining and making up all missed assignments. Assignments due on the date of absence are due upon return. Assignments assigned on the date of absence will be extended by one day for each day of absence. Quizzes that are missed will follow the same format.

Field Trips:

Students are responsible for obtaining all assignments and notes that will be missed during a field trip absence prior to the absence. All assignments and quizzes will be due upon return to class.

Business Calculus
Math 0120
4 Credits

1. This course is an introduction to calculus for students in business, economics and other social sciences. Application of concepts is stressed throughout the course.

2. A rigorous high school algebra that includes exponentials and logarithmic functions or precalculus is a prerequisite for the course. Proficiency in algebraic manipulation is essential.

3. Grading:

Exam I:	15%
Exam II:	15%
Exam III:	15%
Final Exam:	30%
Classwork/Teacher Tests:	25%

The following are topics that will be covered in the class:

1. Derivatives

- Limits
  - Introduction to limits
  - Approaching infinity
  - One-sided limits
- Continuity
- Tangents as rate of change
- Definition of derivatives
- Rules for derivatives
  - Polynomials
  - Products
  - Quotients
  - Chain Rule
  - Powers
  - Implicit
- Marginal analysis in business
- Related rates
- Relative rates of change

2. Application of the Derivative

- Graphing using:
  - First derivative
  - Second derivative
  - Asymptotes and intercepts
- Absolute extrema on a given domain
- Optimizing problems
- Differentials

3. Exponential and Logarithmic Functions

- Algebraic properties review
- Graphs of exponential/log functions
- Constant *e*
- Compounding Interest
- Derivatives
- Chain Rule
- Elasticity of Demand

4. Integration

- Indefinite integral
- Procedures for integrating
  - Polynomials
  - Powers
- Exponentials/logarithmic
  - By substitution
- Growth and decay equations
- Definite integral
- Area
  - Under the curve
  - Between curves
- Definite integral as a limit
  - of a sum
- Using Riemann Sums, Trapezoidal and/or Simpson's Rule
- Applications
  - Average Value of a
    - function
  - Continuous income
    - stream
  - Consumer and
    - producer's surplus
  - Equilibrium price
  - Integration by parts
  - Improper integrals
  - Integration Tables
  - Differential Equations
  - (Separation of variables)

5. Multivariable calculus

- Functions of several variables
- Partial derivatives
- Maxima and minima, the D test
- LaGrange multipliers

OPTIONAL:

- Method of least squares
- Double integrals over
  - rectangular regions
- Logistic Growth

Trigonometric functions

- Review of basic trigonometric values, graphs, and laws
- Derivatives
- Integrals

Arithmetic and Geometric Progressions

Business Calculus (Pitt) Calendar 2016-2017

FIRST 9 WEEKS

____ Summer Assignment

____ **Summer Assignment Quiz**

(1.5, 1.6, 3.6)

_____ Pg. 57 #2-12 even, 26-58 even, 66-70 even

_____ Pg. 67 #12-34 even, 48, 50

_____ Pg. 223 #2-20 even, 34, 36, 40

_____ **Quiz on Limits, Asymptotes and Continuity**

(2.1, 2.2, 2.3)

_____ Pg, 88 #8-12 even, 18-26 even, 38-48 even, 54-58 even

_____ Pg. 100 #2-24 even, 46-60 even

_____ Pg. 114 #4-12 even, 18-34 even

_____ **Quiz on Tangent Lines, Basic Derivatives and Marginal Analysis in Business**

(2.4, 2.5, 2.6, 2.7)

_____ Pg. 124 #2-20 even, 32-52 even, 62

_____ Pg. 135 #14-36 even

_____ Pg. 142 #2-12 even, 20-24 even, 36, 38

_____ Pg. 149 #2-26 even

_____ **Quiz on Product/Quotient/Chain Rules, Higher-Order Derivatives and Implicit Differentiation**

SECOND 9 WEEKS

(3.2, 3.3, 3.4)

_____ Pg. 184 # 2-12 even, 20-30 even, 44

_____ Pg. 193 #6-20 even, 52-56 even

_____ Pg. 201 #6-24 even

_____ **Quiz on Relative/Absolute Extrema, Concavity and Optimization**

(2.8)

_____ Pg. 156 #2-24 even

_____ **Quiz on Related Rates and Differentials and Marginal Analysis**

(4.2, 4.3, 4.4, 4.5, 3.5)

_____ Pg. 264 #2, 4, 28-34 even, Pg. 282 #2-8 even, 20-34 even, 42-50 even, 78

_____ Pg. 273 #2-16 even, 28, 30, Pg. 291 #2-22 even, 36-44 even

_____ Pg. 213 #28-34 even

_____ **Quiz on Exponential and Logarithmic Functions/Derivatives/Elasticity**

_____ **SHALER AREA MIDTERM EXAM/PITT EXAM I**

THIRD 9 WEEKS

(5.1,5.2, 5.3)

_____ Pg. 319 #8-36 even, 42-48 even

_____ Pg. 329 #2-34 even

_____ Pg. 336 #2-46 even

_____ **Quiz on Basic Integration Rules/Integration by Substitution**

(5.4, 5.5)

_____ Pg. 348 #2-38 even, 54-60 even

_____ Pg. 357 #2-8 even, 16-30 even, 42-46 even

_____ **Quiz on Average Value of a Function and Surplus/Equilibrium Price**

_____ **PITT EXAM 2**

(6.2, 6.4)

_____ Pg. 383 #2-38 even

_____ **Integration Exam**

_____ Pg. 391 #2-34 even

_____ **Quiz on Integration by Parts and Using Integration Tables**

FOURTH 9 WEEKS

(Appendix A, 6.3, 6.4)

_____ Pg. A39 #4-8 even, Pg. 364 #8-12 even

_____ Pg. 400 #2-20 even

_____ **Numerical Integration Quiz**

_____ Pg. 410 #2-20 even

_____ **Quiz on Riemann Sums/Midpoint, Trapezoidal and Simpson's Rule/Improper Integrals**

(11.1, 11.2, 7.4, 7.5, 7.6)

_____ Pg. 666 #2-12 even, 22, 24

_____ Pg. 672 #2-26 even

_____ Pg. 452 #2-14 even, 44-50 even

_____ **Quiz on Differential Equations and Partial Derivatives**

_____ Pg. 461 #2-14 even

_____ Pg. 470 #2-22 even

_____ **Quiz on the D Test and LeGrange Multipliers**

_____ **PITT EXAM 3**

_____ **SHALER AREA FINAL EXAM/PITT FINAL EXAM**