University of Pittsburgh

Kenneth P. Dietrich School of Arts and Sciences

College in High School

Options for Implementing
College in High School Calculus

Business Calculus

MATH 0120

This course is an introduction to calculus for students in business, economics, and other social sciences. Application of concepts is stressed throughout the course. 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. The grade is determined by the student's performance on three exams and a comprehensive final. The recommended text for this course is Brief Applied Calculus by Berresford and Rockett, 5th ed. Brooks/Cole, Cengage Learning. A score of 61 or greater on the ALEKS placement examination is required in order to register for the CHS credits for this course.

Department of Mathematics Policies

Calculators:

- A basic scientific calculator is needed (calculators are occasionally permitted for specific kinds of problems).
- Calculators on Pitt exams are not permitted.

Grades and Exams:

- CHS teachers for this course use examinations created by the University of Pittsburgh CHS Faculty Liaison.

CHS Math 0120 and AP

CHS Math 0120 contains no trigonometry and would not be appropriate for combination with an AP course.

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College in High School

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Analytic Geometry and Calculus 1
MATH 0220

This course is the standard first course in a basic calculus sequence required for all mathematics, science, engineering, and statistics students. The text used for Calculus 1 is *Essential Calculus: Early Transcendentals*, by James Stewart (Cengage Learning). However, you may use any textbook as long as the material listed below is included in the book. Successful completion of high school algebra and trigonometry are prerequisites. A score of 76 or greater on the ALEKS placement examination is required in order to register for the CHS credits for this course.

Department of Mathematics Policies

Calculators:

- A basic scientific calculator is needed (calculators are occasionally permitted for specific kinds of problems).
- Calculators on Pitt exams are not permitted.

Grades and Exams:

- CHS teachers for this course use examinations created by the University of Pittsburgh CHS Faculty Liaison.

CHS Math 0220 and AP Calculus AB

CHS Math 0220 is appropriate for concurrent enrollment with AP Calculus AB. Most topics in CHS Math 0220 coincide with curriculum of AP Calculus AB. However, the following topics do not overlap:

CHS Math 0220

- Newton's Method
- Parametric functions and derivatives
- Hyperbolic functions
- Trigonometric substitution
- Integration by parts
- Integration of rational functions with quadratic denominators

AP Calculus AB

- Average Value of a Function
- Volumes of solids of revolution by disk, washer and with known cross-sections
- Slope Fields
- Solution of differential equations by separation of variables

Additional AP Information

- Schools that combine these courses recommend administering fewer AP practice tests, in order to fit in the extra topics of the Math 0220 curriculum.
- One teacher reports that many of the CHS topics (such as Parametric Functions and Derivatives, Hyperbolic Functions, and the advanced integration techniques) can be covered after the AP exam.

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College in High School

Options for Implementing
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Analytic Geometry and Calculus 2

MATH 0230

This course is the standard second course in a basic calculus sequence required for all mathematics, science, engineering, and statistics students. The text used for Calculus 2 is Essential Calculus: Early Transcendentals, 2nd edition, by James Stewart (Cengage). However, you may use any textbook as long as the material that is listed on the course description. The prerequisite is successful completion (a grade of C or higher) of Math 0220 Analytic Geometry and Calculus 1 or an equivalent college course. An AP Calculus AB score of a 4 or 5 will also fulfill the prerequisite.

Department of Mathematics Polices

Calculators:

- A basic scientific calculator is needed (calculators are occasionally permitted for specific kinds of problems)
- Calculators on Pitt exams are not permitted.

Grades and Exams:

- CHS teachers for this course use banks of problems or/and examinations created by the CHS University of Pittsburgh Faculty Liaison.
- The final exam for this course is the actual University of Pittsburgh Math 0230 final examination delivered to CHS teachers by CHS University of Pittsburgh Faculty Liaison.

CHS Math 0230 and AP Calculus BC

CHS Math 0230 is appropriate for concurrent enrollment with AP Calculus BC. CHS Math 0230 covers several topics in more depth, including more differential equations (fulfilling a request from Pitt's School of Engineering). Most topics in CHS Math 0230 coincide with curriculum of AP Calculus BC. However, the following topics do not overlap:

University of Pittsburgh

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College in High School

CHS Math 0230

- Integration with partial fractions with repeating linear factors, quadratic factors, and repeating quadratic factors
- Integrals involving more complex trigonometric substitution
- Applications to physics and engineering – Work
- Differential equations:
  - First Order Linear Differential Equations
  - Second Order Linear Differential Equations
    - homogenous
    - nonhomogeneous
  - Applications of second order linear differential equations

AP Calculus BC

- Partial fractions with non-repeating linear factors only
- Numerical solution of differential equations using Euler's Method