

Pennsylvania Statewide Transfer and Articulation System Uniform Standards for Credit for Prior Learning Exams

Mathematics Exams

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Introduction

In 2017 the Pennsylvania general assembly enacted legislation adding a section to the Pennsylvania Public School Code, 24 P.S. § 20-2004-C(d), requiring public institutions of higher education to:

- (1) Adopt and make public uniform standards for determining academic credit for prior learning as outlined in paragraph (4) within 18 months of the effective date of this subsection.
- (2) Agree to award academic credit for prior learning, which is determined to meet the standards established under section 2004-C(c)(6) and apply the credit toward graduation, unless prohibited by external accreditation or licensure.

This document establishes the uniform standard minimum scores for which all PA Transfer System participating institutions will award academic credit pursuant to 24 P.S. § 20-2004-C(d).

During the standard setting process, committees of faculty and personnel from Transfer System institutions developed minimum score standards for which any participating member of the PA College Transfer System will award credit, as well as additional guidance and recommendations for courses that institutions may offer as equivalencies for exam scores at or above the minimum. The course equivalency recommendations are considered guidance by the Oversight Committee and may vary between institutions in accordance with their course catalog and program design.

Uniform Standard Minimum Scores for Awarding Academic Credit

Exam	Minimum Score to Receive Credit
AP Exams	
AP Calculus AB	3
AP Calculus BC	3
AP Statistics	3
CLEP Exams	
College Algebra	50
Precalculus	50
Calculus	50
College Mathematics	50
IB Exams	
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Mathematics

Advanced Placement (AP) Exams

AP Calculus AB

AP Calculus AB is a course that covers the foundational concepts in first semester calculus. The topics include limits, differentiation, integration, the fundamental theorem of calculus and applications of each of these. Students approach calculus topics graphically, algebraically and numerically.

Minimum Score

Credit will be awarded for a score of 3 or higher.

Rationale

This standard is in line with College Board and American Council on Education's minimum score recommendations <https://aphighered.collegeboard.org/setting-credit-placement-policy/credit-granting-recommendations>.

Additional Credit & Course Equivalency Guidance

For individuals with a score of 3, award credit for an applied calculus course. Some schools do not have such a course; therefore, the decision really needs to be at the institution level as to how the course is accepted. For schools without an applied calculus course mathematics elective credit is an alternative requirement that all institutions should be able to accept.

For individuals with a score of 4 or 5, award credit for Calculus I.

AP Calculus BC

AP Calculus BC is a course that covers the same foundational concepts in the AP Calculus AB course listed above and additionally the topic of series. It extends the content learned in AB to different types of equations (polar, parametric, vector-valued) and new topics (such as Euler's method, integration by parts, partial fraction decomposition, and improper integrals), and introduces the topic of sequences and series. The AP course covers topics in differential and integral calculus, including concepts and skills of limits, derivatives, definite integrals, the Fundamental Theorem of Calculus, and series. The course teaches students to approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections amongst these representations.

Minimum Score

Credit will be awarded for a score of 3 or higher.

Rationale

This standard is in line with College Board and American Council on Education's minimum score recommendations <https://aphighered.collegeboard.org/setting-credit-placement-policy/credit-granting-recommendations>.

Additional Credit & Course Equivalency Guidance

For individuals with a score of 3, award credit for Calculus I.

For individuals with a score of 4 or 5, award credit for both Calculus I and Calculus II.

AP Statistics

The AP course is designed to be the equivalent of a one-semester, introductory college course in statistics. The course introduces students to the major concepts and tools for collecting, analyzing and drawing conclusions from data. Students are exposed to four broad conceptual themes. The first is descriptive statistics and exploring data. This includes describing patterns and departures from patterns. The second is sampling and experimentation. This includes addressing issues in planning and conducting a study. The third is probability and exploring random phenomena using probability and simulation. The last is statistical inference which includes estimating population parameters and testing hypotheses.

Minimum Score

Credit will be awarded for a score of 3 or higher.

Rationale

This standard is in line with College Board and American Council on Education's minimum score recommendations <https://aphighered.collegeboard.org/setting-credit-placement-policy/credit-granting-recommendations>.

Additional Credit & Course Equivalency Guidance

Award credit for an appropriate introductory 3-credit statistics course.

College Level Examination Program (CLEP) Exams

College Algebra

The College Algebra exam covers material that is usually taught in a one-semester college course in algebra. Questions on the exam include algebraic operations, equations and inequalities, functions and their properties and number systems and operations.

Minimum Score

Credit will be awarded for a score of 50 or higher.

Rationale

This standard is in line with College Board and American Council on Education's minimum score recommendations <https://clep.collegeboard.org/develop-your-clep-program/create-a-clep-policy/ace-credit-recommendations> .

Additional Credit & Course Equivalency Guidance

Award credit for a 3-credit college algebra course.

Precalculus

The Precalculus examination assesses student mastery of skills and concepts required for success in a first-semester calculus course. A large portion of the exam is devoted to testing a student's understanding of functions and their properties. Many of the questions test a student's knowledge of specific properties of the following types of functions: linear, quadratic, absolute value, square root, polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric, and piecewise-defined. Questions on the exam will present these types of functions symbolically, graphically, verbally, or in tabular form.

Minimum Score

Credit will be awarded for a score of 50 or higher.

Rationale

This standard is in line with College Board and American Council on Education's minimum score recommendations <https://clep.collegeboard.org/develop-your-clep-program/create-a-clep-policy/ace-credit-recommendations> .

Additional Credit & Course Equivalency Guidance

Award credit for a 3 credit precalculus course.

Calculus

The Calculus examination covers skills and concepts that are usually taught in a one-semester college course in calculus. The content of the exam includes questions on the topics of limits, differential calculus and integral calculus. Algebraic, trigonometric, exponential, logarithmic, and general functions are included.

Minimum Score

Credit will be awarded for a score of 50 or higher.

Rationale

This standard is in line with College Board and American Council on Education's minimum score recommendations <https://clep.collegeboard.org/develop-your-clep-program/create-a-clep-policy/ace-credit-recommendations> .

Additional Credit & Course Equivalency Guidance

For individuals with a score of at least 50 but less than 64, award credit for an applied calculus course. Some schools do not have such a course, therefore the decision really needs to be at the institution level as to how the course is accepted. For schools without an applied calculus course mathematics elective credit is an alternative requirement that all institutions should be able to accept.

For individuals with a score of 64 or higher, award credit for Calculus I.

College Mathematics

The College Mathematics examination covers some of the material generally taught in a general education mathematics college course for non-mathematics majors and majors in fields not requiring knowledge of advanced mathematics. The topics include algebra and functions, counting and probability, data analysis and statistics, financial mathematics, geometry, logic and sets, numbers.

Minimum Score

Credit will be awarded for a score of 50 or higher.

Rationale

This standard is in line with College Board and American Council on Education's minimum score recommendations <https://clep.collegeboard.org/develop-your-clep-program/create-a-clep-policy/ace-credit-recommendations> .

Additional Credit & Course Equivalency Guidance

Award credit for a 3-credit general education mathematics course. Placement for the next mathematics course to be determined at the institutional level based on course offerings at the school.

College Level Examination Program (IB) Exams

(Please note: IB Math HL exams. Assessment exams beginning May 2021 are revised exams and are not part of the below recommendations.)

Mathematics HL 2014

The IB Mathematics HL course rigorously covers a broad range of mathematical topics and encourages students to take considered approaches to various activities and to explore different ideas in order to develop insight into mathematical form and structure and the interrelation of different concepts and techniques. The course helps students develop the appropriate mathematical skills for independent learning and effective analysis and communication of mathematical content and information. Mathematical topics include calculus, vectors, probability and statistics as well as the prerequisite topics of trigonometry, functions and algebra.

Minimum Score

Credit will be awarded for a score of 4 or higher.

Rationale

This standard is in line with International Baccalaureate minimum score recommendations.

Additional Credit & Course Equivalency Guidance

The Mathematics subcommittee recommends the following: A score of 4 or 5 equates to up to 3-4 credits of Pre-Calculus or Applied Calculus*. *Depending on a student's major, pre-calculus or applied calculus may be more beneficial for their program. A score of 6 or 7 equates to up to 6-8 credits of Pre-Calculus and Calculus I. Ultimately, credit should be awarded based upon the student's selected program, program structure, and best interest of the student at the discretion of the awarding institution.

Further Mathematics HL 2014

The IB Further Mathematics HL is designed for students with a particular aptitude and interest in mathematics, enabling them to study some deeper and broader aspects of the discipline. It allows students to learn about a variety of branches of mathematics in depth and also to appreciate practical applications. Since this course covers topics at a broader level than Mathematics HL, it is expected that students taking this course will also be familiar with the content of Mathematics HL. Topics covered include linear algebra, geometry and areas selected from the advanced topics included in Mathematics HL syllabus. It should be noted that students were allowed to register for mathematics HL only **or** for further mathematics HL only **or** for both. However, students who registered for further mathematics HL were presumed to know the topics in the core syllabus of mathematics HL and to have studied one of the options, irrespective of whether they also registered for mathematics HL

Minimum Score

Credit will be awarded for a score of 4 or higher.

Rationale

This standard is in line with International Baccalaureate minimum score recommendations.

Additional Credit & Course Equivalency Guidance

The Mathematics subcommittee recommends the following: A score of 4 or 5 equates to up to 3-4 credits of Calculus I, Discrete Mathematics, or Statistics. A score of 6 or 7 equates to up to 6-8 credits of Calculus I, Discrete Mathematics, and/or Statistics. Ultimately, credit should be awarded based upon the student's selected program, program structure, and best interest of the student at the discretion of the awarding institution.