

Secaucus High School

Advanced Placement Course Descriptions for the 2018-19 School Year

7450 AP Macroeconomics	L/AP	11,12	5 Credits
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Prerequisites: Personal Financial Literacy, Teacher and Supervisor Recommendation

The purpose of AP Macroeconomics is to provide students with a college level course introducing both basic economics as well as principles of macroeconomics. This course presents a realistic view of American business within our economic system and global economic systems. It will introduce and reinforce the concept of economics as the social science that studies the basic economic problem (scarcity), and how we allocate our limited resources to satisfy our unlimited wants and needs. Students will learn the importance of money as a means of exchange and a store of value, and how economic events impact the value of the dollar (currency). Particular emphasis is placed on the study of national income, how government and central banking decisions affect Gross Domestic Product, fiscal and monetary policy, economic performance measures, economic growth, and international trade. Additional core concepts include inflation, the business cycle, pricing, supply and demand, and how consumers drive business decisions by voting in the marketplace with their dollars.

1350 *Advanced Placement English Language and Composition	L/AP	11, 12	5 Credits
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Prerequisites: Concurrently enrolled in English 11 Honors or English 12 Honors, teacher recommendation, >=A- in English 10 honors, >=780 PARCC score, >=1300 Renaissance score

The Advanced Placement English Language and Composition is the high school's most sophisticated writing course and is taught as an extension of St. Peter's College. Students will read, model and expand upon a variety of rhetorical forms while advancing their writing skills. This course is strongly recommended for students taking Advanced Placement English Literature. All students enrolled can take the Advanced Placement Test in May.

1450 *Advanced Placement English Literature and Composition	L/AP	12	5 Credits
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Prerequisites: Teacher recommendation, >=A- in English 11 Honors, PARCC English 11 >=780 score, Renaissance Reading >=1300

The Advanced Placement English literature course, the most advanced of the English curriculum, is one of a two-part program reserved only for sophisticated English students. The course is taught as an extension of St. Peter's College and includes extensive reading and intensive, varied composing experiences for the student who has already demonstrated above-average talent and interest in English. All students enrolled may take the Advanced Placement Test in English Literature and Composition in May.

3453 *Advanced Placement Calculus BC	L/AP	11, 12	10 Credits
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Prerequisites: >=88 in Pre-calculus Honors or >=85 in the Pre-Calculus Summer Course, Renaissance Math >=1300, PARCC Algebra II >=770, and Pre-Calculus Teacher Recommendation

This course is equivalent to a two-semester, college-level calculus class and will include: length of a plane curve, areas of a surface of revolution, work, fluid pressure and force, hyperbolic functions, improper integrals, sequences and series, convergence tests, the comparison test, conditional convergence, power series, Taylor and Maclaurin series, applications of Taylor series, and differentiation and integration of power series. The computer and/or graphing calculator are used as part of instruction. All students enrolled may take the AP Test in May.

3454 *Advanced Placement Calculus AB	L/AP	11, 12	5 Credits
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Prerequisites: >=91 in Pre-Calculus or >=85 in Pre-Calculus Summer Course, Renaissance Math >=1300, PARCC Algebra II >=770, and Pre-Calculus Teacher Recommendation

This course is equivalent to a first semester college calculus course devoted to topics in differential and integral calculus. The course covers topics in these areas, including concepts and skills of limits, derivatives, definite integrals, and the Fundamental Theorem of Calculus. 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. The computer and/or graphing calculator are used as part of instruction. All students enrolled may take the AP Test in May. The AP application is located on Page 49.

3452 *Advanced Placement Statistics	L/AP	11, 12	5 Credits
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Prerequisite: ≥ 88 in *Pre-Calculus* or ≥ 85 in *Pre-Calculus Summer Course*, *Renaissance Math* ≥ 1300 , *PARCC Algebra II* ≥ 750 , and *Pre-Calculus Teacher Recommendation*

The purpose of this course is to introduce students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. Students will be exposed to the following topics: exploring data, observing patterns, planning a study, deciding what and how to measure, anticipating patterns, producing models using probability and simulation, statistical inference and confirming statistical models. All students enrolled may take the AP Test in May.

3455 *Calculus III	L/AP	12	5 Credits
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Prerequisites: AP Calculus BC

In this course students will apply previously developed skills learned in AP Calculus BC to learn Multivariable Calculus and Vectors. Vectors, Partial Derivatives, Multiple Integrals and Vector Fields will be covered to prepare students for further study in technological disciplines and more advanced mathematics courses. Students will also be exposed to relevant applications in science and engineering to illustrate the utility of learning these topics. Students will use mathematical software, in problem solving, to allow the solution of more complex problems and provide visualization of the mathematical concepts in three dimensions. This course will prepare students for further study in technological disciplines and more advanced mathematics courses as well as illustrate the utility of learning Multivariable Calculus to solve problems in engineering and the sciences.

3456 *AP Computer Science Principles (w/ Pre-Calculus Honors)	L/AP	10	5 Credits
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Prerequisites: Algebra II Honors

This is an advanced placement course in Computer Science and the curriculum is determined by the College Board. The course introduces students to computer science with fundamental topics that include problem solving, design strategies, and methodologies, organization of data (data structures), approaches to processing data (algorithms), analysis of potential solutions, and the ethical and social implications of computing. The course emphasizes both object-oriented and imperative problem solving and design using Java language. These techniques represent proven approaches for developing solutions that can scale up from small, simple problems to large, complex problems. Additionally, all of the core topics from advanced honors precalculus will be incorporated as examples to illustrate the principles of programming.

3457 *AP Computer Science A	L/AP	11, 12	5 Credits
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Prerequisites: Algebra II

This is an advanced placement course in Computer Science and the curriculum is determined by the College Board. This course introduces students to the central ideas of computer science, including the ideas and practices of computational thinking. The course invites students to understand how computing changes the world. This rigorous course promotes deep learning of computational content, develops computational thinking skills, and engages students in the creative aspects of the field. This course does all this without burdening the students with additional challenges of having to learn a new language. The course is broken up into the Seven Big Ideas of computing; Creativity, Abstraction, Data and Information, Algorithms, Programming, the Internet, and Global Impact. The course focuses on allowing the students to be creative in their problem solving skills. Students are placed within the framework of programming but often not required to have to learn the hard details behind the code. This allows them to more freely express their creative ideas

without the burden of syntax. The course gives students the background and required thinking skills which are important in solving algorithms in upper level computer classes.

8851 AP Music Theory	L/AP	11, 12	5 Credits
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Prerequisite: Students should have acquired at least basic performance skills in voice or on an instrument.

Teacher recommendation.

AP Music Theory is a college-level music course designed to develop a student's ability to recognize, understand, communicate and compose within the basic materials and processes of The Common Practice Era. The achievement of these goals will be approached through instruction in music history (context), vocabulary development, ear training (sight singing and dictation,) notational skills, part-writing, formal analysis, composition and exposure to a wide variety of music literature. The student's ability to read and write musical notation is fundamental to success in this course. It should also be assumed that the student has acquired at least basic performance skills through formal study of voice or other musical instrument. Enrollment in a performance ensemble is not a requirement, although it is recommended.

4203 Advanced Placement Physics I	L/AP	9 (STEM Academy), 10	5 Credits
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Prerequisites: >=B+ in Science 8 Honors or >=A in PSI Physics, Renaissance Math >=1300, PARCC Algebra I >=800, and Science teacher recommendation

AP Physics 1 is the first of a two year sequence that is designed to prepare students to take the AP Physics 2 examination. This course is organized around six big ideas combining together the fundamental science principles and theories of a general physics college course. It begins by integrating the use of trigonometric functions into Algebra-Based Physics topics of mechanics, waves, sound waves and electricity. This allows students to solve problems with vectors that are oriented at arbitrary angles; rather than just parallel or perpendicular to one another.

This course emphasizes problem solving in the context of the principles of physical laws and principles; as well as the ability to apply that knowledge and skill to phenomenon in either an experimental or theoretical setting. Great attention is given to strengthening and reinforcing the natural connections between the sciences and real world. About 25% of instructional time will be spent on hands-on laboratory activities with an emphasis on inquiry-based investigations.

4204 Advanced Placement Physics II	L/AP	10 (STEM Academy)	5 Credits
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Prerequisites: >= A- in AP Physics 1, Renaissance Math >=1300, PARCC Algebra 1 >=800, and Physics teacher recommendation

AP Physics 2 is equivalent to most college-level introductory physics courses with a focus on the following topics: fluid statics and dynamics, thermodynamics, PV diagrams and probability, electrostatics, electrical circuits with capacitors, magnetic fields, electromagnetism, physical and geometric optics, and other topics in modern physics. This course emphasizes problem solving in the context of the principles of physical laws and principles; as well as the ability to apply that knowledge and skill to phenomenon in either an experimental or theoretical setting. Great attention is given to strengthening and reinforcing the natural connections between the sciences and real world. About 25% of instructional time will be spent on hands-on laboratory activities with an emphasis on inquiry-based investigations. Much of the work done in the laboratory will include the gathering of data through low-tech and high-tech (PASCO electronic sensors) lab investigations. That data will be configured by the students using the PASCO software and then analyzed using that software as well as a number of compatible programs, including Word and Excel. Through this process both analytical techniques as well as technological capability will be developed.

4450 Advanced Placement Biology	L/AP	11, 12	5 Credits
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Prerequisites: >=A- in Biology Honors, Chemistry Honors, and Human Anatomy, Renaissance Math >=1300, PARCC Algebra 2 >=750, and Biology teacher recommendation

This AP Biology course is designed to be the equivalent of the general biology course usually taken during the first year of college. For most students, the course enables them to undertake, as a freshman,

second year work in the biology sequence at their institution or to register in courses in other fields where general biology is a prerequisite. This course is structured around the four big ideas articulated in the AP Biology curriculum framework provided by the College Board: Big Idea 1: The process of evolution drives the diversity and unity of life. Big Idea 2: Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis. Big Idea 3: Living systems store, retrieve, transmit, and respond to information essential to life processes. Big Idea 4: Biological systems interact, and these systems and their interactions possess complex properties. A special emphasis will be placed on the seven science practices, which capture important aspects of the work that scientists engage in, with learning objectives that combine content with inquiry and reasoning skills. Advanced laboratory activities are an integral part of the program and will be assessed regularly throughout the course. All students enrolled will have the option of taking the AP Test in May.

4452 Advanced Placement Chemistry **L/AP** **11, 12** **5 Credits**

Prerequisite: >=A- in PSI Chemistry Honors, Renaissance Math >=1300, PARCC Algebra II >=760, and Science teacher recommendation

This AP Chemistry course is designed to be the equivalent of the general chemistry course usually taken during the first year of college. For most students, the course enables them to undertake, as a freshman, second year work in the chemistry sequence at their institution or to register in courses in other fields where general chemistry is a prerequisite. This course is structured around the six big ideas articulated in the AP Chemistry curriculum framework provided by the College Board; 1. Structure of Matter, 2. Bonding and Intermolecular Forces, 3. Chemical Reactions, 4. Kinetics, 5. Thermodynamics, and 6. Chemical Equilibrium. A special emphasis will be placed on the seven science practices, which capture important aspects of the work that scientists engage in, with learning objectives that combine content with inquiry and reasoning skills. Laboratory experiences are integrated into the course, emphasizing content covered. All students enrolled may take the AP Test in May.

4453 Advanced Placement Environmental Science **L/AF** **11, 12** **5 Credits**

Prerequisite: PSI Biology, Renaissance Math >=1300, PARCC Algebra II >=760, and Science teacher recommendation

Advanced Placement Environmental Science is considered to be interdisciplinary, combining the basic principles of biology, chemistry, physics, and earth science in order to encompass the scientific processes occurring in the natural world of systems around us. The curriculum is tailored to the guidelines posted by the College Board. Students enrolled will be eligible to take the AP Test in May.

4455 *Advanced Placement Physics C **L/AP** **11, 12** **10 Credits**

Prerequisites: >=91 in Physics Honors OR AP Physics II, AP Calculus AB or BC, Renaissance Math >=1300, PARCC Algebra II >=760, and Science teacher recommendation

Advanced Placement Physics C is a college-level, calculus-based advanced Physics course typically taken by students with a particular interest in physics. Topics include: scalar and vector quantities of mechanics; rectilinear and circular motion; equilibrium and Newton's laws of motion; work, energy, momentum; the conservation laws; simple dc circuits, the electric field, the magnetic field, electric potential, capacitance relationships between electric and magnetic fields, inductance, and simple ac circuits. A college text will be used to follow a curriculum influenced by College Board standards and optional college credits will be available from St. Peter's College (for a nominal fee). Laboratory experiences are integrated into the course, emphasizing content covered. All students enrolled may take the AP Physics C Test (in two parts) in May.

5550 *Advanced Placement Spanish **L/AP** **12** **5 Credits**

Prerequisites: >=91 in Spanish IV, Renaissance Reading >=1200, PARCC English 11 >=750, and Spanish teacher recommendation

This course includes extensive reading, writing, listening and speaking experiences for the student who has already demonstrated above average knowledge and interest in Spanish. This course emphasizes the use of the Spanish language for active communication; which includes oral skills, reading comprehension,

grammar and composition. Students enrolled in this course are expected to complete significant, sustained independent work. Students are may take the Advanced Placement Exam in May.