

Legend College Preparatory Course Descriptions (Summer 2018)

Students, not statistics.

We believe that students need to stand head and shoulders above the competition to thrive in Silicon Valley's academic environment. Although we expect the highest academic rigor from our teachers and students alike, we have all come to realize that a simple GPA or test score is enough to differentiate an individual in a sea of gifted people. Legend's students are not merely a set of high scoring statistics. They are young people with a story to tell and a goal to achieve.

To tell that story, they must select the right opportunities that help them get to where they need to go. A student must find his or her voice, determine a destination, and continue on the journey towards college. Along the way, that student – your student – needs the right skills, classes, and vision to know why his or her endeavor is important.

Our course offerings, as you will see, include everything from the traditional progression of math classes to AP courses not commonly found in our local region. We present this course list as a set of options which will let your student become differentiated, well educated, and acquire a deep sense as to why an education matters not just to oneself, but that it leads to greater benefits for the communities they will live and serve in.

We are always happy to help you select your courses or answer any questions you may have. Please reach out to me or our Student Affairs Manager, Priscilla Chan, if you need to set up an appointment. I look forward to serving you and your family this summer.

Joshua Chan
Dean of Academics

Math

All math classes from Algebra I to Pre-Calculus Honors have an optional STEM Extension. Students who enroll in this option learn how their current math skills are applicable to different outlets in science, technology, and engineering. We highly encourage students who intend to apply for STEM majors to enroll in STEM Extensions to prepare themselves for research, lab work, modeling, and experimentation for future advanced coursework. These courses serve to distinguish our students with skills not otherwise taught in traditional math-only classes.

Algebra I

In this first year algebra course, the student will learn symbolic reasoning. This includes structures in expressions, arithmetic with polynomials and rational functions, creating equations, reasoning with equations and inequalities, and implementing mathematical practices based on efficiency and deduction. The student writes, solves, and graphs linear and quadratic equations, including systems of two equations with two unknowns. Strategies for solving quadratic equations and factoring are also covered.

*Schedule: M/W 9:00am – 12:30pm
Prerequisite(s): Pre-Algebra*

Cost: \$1,195

Text: McDougal Littell Algebra 1 by Boswell Hardcover – 2006
ISBN 13:978-0- 618-81176- 2

Geometry Honors

This course builds a solid foundation in geometry with emphasis on formal mathematical proofs and logic reasoning. Students learn problem solving with methods such as direct and indirect proofs, induction, and deduction. Some topics include: congruence and similarity of triangles and other polygons, parallel and perpendicular lines and their associated angles, polygon properties and the formulas associated with several plane and solid figures.

Lastly, the course assumes students will progress to Algebra II/Trig, and prepares them accordingly.

Schedule: M/W 9:00am – 12:30pm OR T/Th 9:00am – 12:30pm

Prerequisite(s): Algebra I

Cost: \$1,495

Text: Geometry- Geometry, McDougal Littell, Houghton Mifflin (Jurgensen, Brown, Jurgensen)
ISBN 13: 978-03959772794

Algebra II/Trig

The Algebra II/Trigonometry course is an extension of Algebra I and Geometry. It involves a review of the operations of the real number system, solutions of linear equations and inequalities in two and three variables, properties of polynomials, complex numbers, and rational expressions. The concepts of relations and functions are developed, emphasizing linear, quadratic, exponential, logarithmic, trigonometric functions, as well as conic sections, probability and matrix algebra.

Schedule: T/Th 1:30pm – 5:00pm

Prerequisite(s): Algebra I (required – grade of B or better), Geometry (preferred)

Cost: \$1,495

Text: McDougal Littell Algebra 2: Applications, Equations, Graphs ISBN-13: 978-0618250202

Math Analysis

Math Analysis is designed as a full year course in Advanced Mathematics. It is generally taken after Algebra II. Topics include: basic and derived trigonometric functions, radian measure and circular functions, trigonometric identities, inverse trigonometric functions. Trigonometric equations, applications of trigonometric functions, vectors, complex numbers, and polar and parametric equations.

Schedule: M/W 1:30pm – 5:00pm

Prerequisite(s): Algebra II

Cost: \$1,795

Text: Advanced Mathematics by Richard G. Brown, McDougal Littell 2003 ISBN 0618250379

Pre-Calculus Honors

This course is designed for students who have successfully completed a course in Algebra II and, preferably, another course in Trigonometry. It will provide an in-depth study of all topics essential to the study of AP Calculus. Students will be actively engaged in problem solving, reasoning, connecting and communicating mathematically as they explore families of functions and their characteristics, advanced trigonometry concepts, matrices, analytical geometry, vectors, probability, sequences, and limits. The course will require the completion of a research project connecting the concepts covered in class to a real world application.

Schedule: M/W 1:30pm – 5:00pm

Prerequisite(s): Algebra II (required – grade of B or better), Algebra II/Trig or Trigonometry (preferred)

Cost: \$1,795

Text: Ron Larson and Robert Hostetler, Precalculus with Limits

ISBN 13: 9781133962885

AP Calculus AB

This is a comprehensive year-long course in the study of both differential and integral calculus and is intended to be the equivalent of a college level Calculus I course. Students will be studying the ideas of functions, graphs, limits, derivatives and integrals as outlined in the AP Calculus Course description. The intent is for students to master the fundamentals of calculus in order to succeed on the AP Calculus AB exam and be adequately prepared to be successful in higher mathematics courses.

This course will include the following topics: review of important precalculus concepts, limits and continuity, derivatives, applications of the derivative to Physics and Finances, implicit differentiation, related rates, integration, applications of integration to Physics and other areas, slope fields, curve sketching, differential equations, improper integrals and L' Hôpital's rule.

Schedule: M/W 1:30pm – 5:00pm

Prerequisite(s): Pre-Calculus Honors

Cost: \$2,195

Text: Calculus (10th Edition) by Ron Larson and Bruce Edwards

ISBN 12: 978-1-285-06030-9

AP Calculus BC

This is a comprehensive year-long course in the study of both differential and integral calculus and is intended to cover the equivalent of a college level Calculus I and a Calculus II course. Students will be studying the ideas of functions, graphs, limits, derivatives and integrals as outlined in the AP Calculus Course description. The intent is for students to master the fundamentals of calculus in order to succeed

on the AP Calculus AB exam and be adequately prepared to be successful in higher mathematics courses.

This course will include the following topics: review of important precalculus concepts, limits and continuity, derivatives, applications of the derivative to Physics and Finances, implicit differentiation, related rates, integration, applications of integration to Physics and other areas, slope fields, curve sketching, differential equations, improper integrals, polar and parametric functions, series convergence and polynomial approximation.

Schedule: M/W 1:30pm – 5:00pm

Prerequisite(s): Pre-Calculus Honors (required). Prior exposure to Calculus concepts (recommended)

Cost: \$2,445

Note: Additional Meetings for AP Calculus BC Students on 6/29, 7/13, 7/20.

Text: Calculus (10th Edition) by Ron Larson and Bruce Edwards ISBN 12: 978-1-285-06030-9;
Calculus, Early Transcendentals by James Stewart ISBN 0538497904

AP Statistics

AP Statistics is the high school equivalent of an introductory college statistics course. In AP Statistics, we will focus on four major themes: exploratory data analysis, designing studies, probability models and simulation, and statistical inference. In essence, students develop strategies for collecting, organizing, analyzing, and drawing conclusions from data. Students design, administer, and tabulate results from surveys and experiments.

Probability and simulations aid students in constructing models for chance phenomena. Sampling distributions provide the logical structure for confidence intervals and hypothesis tests. Students might use a TI-83 graphing calculator, statistical software (Minitab), and Web-based java applets and activities to investigate statistical concepts. To develop effective statistical communication skills, students are required to prepare frequent written and oral analyses of real data.

Schedule: M/W 9:00am – 12:30pm

Prerequisite(s): Pre-Calculus Honors (recommended) or Math Analysis

Cost: \$2,195

Text: Starnes, Tabor, Yates, and Moore. The Practice of Statistics (Fourth Edition). New York: W. H. Freeman & Co. ISBN 978-1429245593

Science

Conceptual Physics

This course is designed for students seeking a strong foundation in Physics and better preparation for College-level Physics. It is intended to bridge the gap between Physical Sciences courses covered in the traditional Middle School curriculum and the more advanced Physics knowledge and understanding expected in AP Physics classes, while requiring no more than Algebra I and some Geometry.

Topics covered include: force and motion, work and energy, circular and rotational motion and dynamics, static equilibrium, electricity and magnetism, thermodynamics, fluid mechanics, vibration and sound, waves and optics, and nuclear physics. We will focus on theory as well as real world applications, with a special emphasis on understanding how physical phenomena manifest themselves, why they occur and what makes them relevant to everyday life. Students are expected to be highly motivated and self-starters and to be able to perform a significant amount of independent study. A final project based on real world applications completes this course.

Schedule: T/Th 1:30pm – 5:00pm

Prerequisite(s): Algebra I

Cost: \$1,315

Text: Conceptual Physics by Paul G. Hewitt

ISBN 10-0133647498

Biology Honors

This course is an accelerated, lab-oriented introduction to Biology. It emphasizes cell structure and function, molecular basis of heredity, biological evolution, organism interdependence, matter, energy, and organization of living systems, and behavioral regulation of organisms. Major topics are enhanced by laboratory experience.

Schedule: M/W 1:30pm – 5:00pm

Prerequisite(s): None

Cost: \$1,995

Text: Biology by Kenneth Miller & Joseph Levine ISBN 0-13-201349-5

Chemistry Honors

Chemistry Honors is designed for students who intend to take college level classes in Chemistry. Through classroom discussion and individual investigation, reading and direct experiment, students are invited to discover and understand the chemical processes and systems governing the physical world around them.

Students are guided through the understanding of the scientific method, atomic composition and structure, analysis of the Periodic Table and properties of elements, bonding of elements, chemical reaction and molarity calculations, theory of gases, acids and bases, chemical equilibrium, reaction rates, and organic chemistry.

Schedule: T/Th 1:30pm – 5:00pm

Prerequisite(s): Biology

Cost: \$1,995

Text: Modern Chemistry by Holt, Winston, and Rinehart

ISBN 0030565375

AP Biology

AP Biology is a rigorous and demanding course, which is the equivalent of an introductory college biology course.

Content is covered with high expectations placed on interpretation and analysis of information than other biology courses. In addition, statistical analysis of data and modeling of concepts will be required. A significant amount of studying must be completed at home to allow time for discussion, labs, and inquiry during class time. Students will be prepared for the AP exam at the conclusion of this course.

Schedule: M/W 9:00am – 12:30pm

Prerequisite(s): Biology (required), Chemistry or Chemistry Honors (preferred)

Cost: \$2,395

Text: Campbell Biology AP Edition 8th edition

ISBN 0131356917

AP Chemistry

This is an advanced placement course designed to prepare the student for the AP Chemistry exam, and covers the equivalent of one full year of college level General Chemistry. It is a rigorous math-based course, with a strong laboratory component. The primary goal of the course is to understand the principles of modern chemistry in greater depth, including stoichiometry, reactions, kinetics, equilibrium, thermodynamics, and electrochemistry, while also demonstrating the ability to use this understanding in the solution and meaningful communication of mathematically based laboratory and textbook problems.

Schedule: T/Th 9:00am – 12:30pm

Prerequisite(s): Biology (required), Chemistry or Chemistry Honors (preferred)

Cost: \$2,395

Text: Chemistry: The Central Science 13th Edition ISBN-13: 978-0321910417

The AP Physics series comprise of four classes. AP Physics 1 and 2 are algebra-based, focusing on Mechanics and Electricity & Magnetism, respectively. The AP Physics: C series mirrors this progression, but is taught at greater depth and assumes that students are taking AP Calculus concurrently to the course. We are not currently offering AP Physics 2 or the AP Physics: C courses this summer as group classes. However, if you have an interest in doing such a class 1-on-1, please feel free to reach out to us and make an inquiry.

AP Physics 1

This algebra-based course is designed for students seeking an introductory class in College-level Physics. Topics covered include: force and motion, work and energy, circular and rotational motion and dynamics, static equilibrium, electricity and electrostatics, waves and sound. We will focus on theory as well as applications, with emphasis on extensive problem solving. Students are expected to be highly motivated and self-starters and to be able to perform a significant amount of independent study. A final project, based on real world applications completes this course. While this course is definitely

challenging, fun is not left out of the equation and students will have the opportunity to participate in many interesting and even entertaining labs and in-class competitions! Some preparation for the AP Physics 1 examination is included in the class.

Schedule: T/Th 9:00am – 12:30pm

Prerequisite(s): Algebra I (required); Algebra II/Trig or Trigonometry (recommended)

Cost: \$2,395

Text: Giancoli Physics Principles and Applications

ISBN 978-0130606204

Social Sciences

Social Science courses at Legend College Preparatory are fine tuned to challenge students' critical thinking, reading, and communication skills. They are a powerful addition to any student's course of study as they build an education towards interdisciplinary studies. Whether a student intends on pursuing liberal arts or engineering, the most compelling college candidates are ones who have an education in their domain expertise as well as an understanding of how the world and its people function.

AP Human Geography

Human Geography is the study of how people spatially organize society, with repercussions on the cultural spread of ideas, economic growth, political dealings, identity formation, religious formation, and even linguistic influence. We recommend this course for students as a way of making sense of the world in preparation for advanced social science courses and other interdisciplinary studies.

AP Human Geography is a good entry-level AP course for any student to enroll in and counts as a 4th year Social Science credited course for college admissions.

Schedule: M/W 1:30pm – 5:00pm

Prerequisite(s): None; 9th grade level critical reading & writing skills highly recommended

Cost: \$2,195

Text: The Cultural Landscape: An Introduction to Human Geography (12th Edition) by James Rubenstein

ISBN-13: 978-0-13-427019-7

AP Economics

AP Economics consists of AP Macroeconomics and AP Microeconomics, which combine together for a year-long course. Economics, as a discipline, makes sense of how the world manages resources for production, consumption, and distribution. Students come away with knowledge of how markets function on large and small scales, the role of government policy, and reasoning behind individual decision making.

Schedule: T/Th 1:30pm – 5:00pm

Prerequisite(s): Algebra I

Cost: \$2,195

Text: Macroeconomics, 3rd Edition, by Krugman and Wells. ISBN-13: 978-1429283434; Microeconomics, 3rd edition, by Krugman and Wells. ISBN-13: 978-1429283427

AP Psychology

AP Psychology is a college-level survey of theories of human behavior from a variety of perspectives. Students are expected to demonstrate proficient identification of biological, cognitive, and social factors which shape internal mental processes and external behaviors. These concepts are linked to real-life scenarios, experiments, current research, and the students' everyday lives. Applicable to a wide set of backgrounds, we highly encourage students to add this class to their course of study!

Schedule: M/W 9:00am – 12:30pm

Prerequisite(s): None

Cost: \$2,195

Text: Myers' Psychology for AP: 2nd Edition ISBN-13: 978-1464113079

Language Arts

One of the goals at Legend College Preparatory is to equip its student body with skilled communicators. This entails a mastery of the English language, understanding and interpretation of a variety of texts, and a richer understanding of American culture.

AP English Language & Composition

AP English Language & Composition prepares students for college-level content in reading, writing, reasoning, argumentation, and presentation. Students must analyze a variety of topics and material to synthesize ideas, form positions, and provide reasoning and support for conclusions. All students are encouraged to develop their own voice through style, nuanced use of language, and rhetoric.

Schedule: T/Th 9:00am – 12:30pm

Prerequisite(s): 10th grade Language Arts or equivalent

Cost: \$2,195

Critical Reading, Persuasion & Presentation

Students read, analyze, and discuss the elements of what makes a good persuasive presentation, how these are reflected in famous written speeches, and how they are delivered in terms of their rhetorical elements. They examine one or more controversial topics, looking at the opposing viewpoints and the supporting evidence presented. Students develop and perfect their critical reading, writing, and presentation skills by summarizing these sources of information, taking a position and stating their argument, selecting the details to support their argument, then presenting it, taking into consideration opposing viewpoints. Students will research, write, and present between two and four persuasive essays during this class.

Schedule: M/W 1:30pm – 5:00pm

Prerequisite(s): None

Cost: \$1,495

Electives

Our electives are for those who are determined to rise above the rest. These students set goals, build projects, research, and take time to create tangible results that show the world how serious they are. Are you that student? If so, ask us how these electives will get you ahead of the curve.

Introduction to Java Programming

This course will provide an overview to basic concepts and techniques of programming in Java, a high-level, object-oriented language. We will focus on the fundamental areas of software development: syntax, control-flow mechanisms, keyboard and mouse interactions, file i/o, object modeling, and debugging. Through a series of practical exercises, students will be introduced to the basic concepts of Object-Oriented programming, to the fundamentals of the Java language and to some of the more common Java libraries from the core Java API. By the end of the course, students will be able to implement and debug small Java programs and will be prepared for further programming courses.

Schedule: M/W 1:30pm – 5:00pm

Prerequisite(s): Algebra I

Cost: \$1,795

Requirements: Laptop required. Parents will receive an email on necessary setup prior to the first day of class. There is no textbook for this course as the teacher will provide materials.

AP Computer Science A

This course serves both as a second-level course in Java programming and as an introductory course for students who will major in disciplines that require significant involvement with computing. While a previous course in computer programming is not a prerequisite, this class is quite challenging and such a class is highly recommended. Topics include program design and implementation, algorithm analysis, standard data structures, and object-oriented programming design. AP Computer Science in Java emphasizes programming methodology with an emphasis on problem solving and algorithm development.

Schedule: T/Th 9:00am – 12:30pm

Prerequisite(s): Introduction to Java or equivalent experience

Cost: \$2,195

Text: Java Methods A and AB, AP Edition, by Maria Litvin and Gary Litvin ISBN 978-0972-7055-78

Requirements: Laptop

AP Computer Science Principles

Students will learn the general principles of computer science by connecting the impacts of computing on people and society. Information, data analysis, and knowledge are presented in an abstracted manner for the purposes of problem solving. Skills learned will include the communication of justification and reasoning for design and solution implementation, analysis of algorithms, testing/debugging methods, and coming to conclusions to trends from data.

Schedule: T/Th 1:30pm – 5:00pm

Prerequisite(s): None

Cost: \$2,195

Java Programmer I Certification

The Java Programmer I Certification is intended for students who wish to add a career boosting course to their study program. This class covers the basics of Object-Oriented programming using the Java SE programming language. Through a thorough understanding of concepts, as well a series of hands on exercises, students will build a solid foundation of the Java SE language and enhance their professional knowledge. At the completion of this course, students will have the opportunity to take the Oracle Java SE Programmer I certification exam.

Schedule: F 1:30pm – 5:00pm

Prerequisite(s): None

Cost: \$1,595

Introduction to SQL using Oracle Database

This class is intended for students who wish to obtain an introduction to the SQL language and to understand simple principles of database management. Students will learn the following SQL concepts: basic concepts of relational database, retrieve rows and columns from tables. create reports of sorted and restricted data, create indexes and constraints, manage and alter existing schema objects, control database access to specific objects, create and query external tables, and control privileges at the object and system level. This course will teach students how to use queries and manipulate data within a database, use dictionary views to retrieve data and create reports about their schema objects. Some of the date-time functions available in the Oracle Database are also covered. Students who complete this course will have the opportunity to take the Oracle Database certification exam 1Z0-061.

Schedule: F 1:30pm – 5:00pm

Prerequisite(s): None

Cost: \$1,595

MTA – Introduction to Programming Using Block-based Language

This course is intended for students new to programming and who would like to understand the principles of programming using an approachable and attractive method involving easy visualization and representation of coding mechanisms. Students will use Scratch in order to solve computational problems, design and develop algorithms, work with data representation, use modeling and simulation, implement solutions by coding various programs, understand the components of internet communication, implement encryption and authentication strategies, and understand and use the software development process in order to plan and develop programming projects. Students who complete this course successfully will have the option of taking the Microsoft Certification Exam 98-380 (MTA – Introduction to Programming using Block-Based Language).

Schedule: F 9:00am – 12:30pm

Prerequisite(s): None

Cost: \$1,595