

**Mountain Vista Governor's School**  
**Course Descriptions with Coding Number**  
**2016-2017**

Students completing these courses may earn dual enrollment credit with Lord Fairfax Community College approval.

**MVGS Collegiate Chemistry 448009:** Collegiate Chemistry is an introductory college chemistry course. The curriculum is laboratory based and includes study in matter and measurement, atoms, molecules, ions, ionic and covalent bonding. Second semester includes study in liquids and solids, solutions, chemical kinetics, chemical equilibrium, and acids and bases. Upon completion of this course, the student will be eligible to take the Advanced Placement Chemistry examination. Students will earn one science credit, which will meet the requirement for Chemistry, including the Virginia Standards of Learning requirements.

**MVGS Physics I: Mechanics 451019:** Physics I is a calculus-based, first-year physics course. The primary focus of study will include the topics of Newtonian mechanics and thermodynamics. Inquiry-based laboratory investigations include extensive integration of technology. This course is integrated with MVGS Calculus I. Upon successful completion of the course, students will be eligible to take the Advanced Placement Physics C: Mechanics examination.

**MVGS Physics II: Electricity and Magnetism 452029:** Physics II is a calculus-based, second-year physics course. Inquiry is stressed and laboratory investigations incorporate extensive integration of technology. The primary focus of study will include the topics of electricity and magnetism and modern physics. This course is integrated with MVGS Calculus II with Multivariable. Upon successful completion of the course, students will be eligible to take the Advanced Placement Physics C: Electricity & Magnetism examination.

**MVGS Biology I: Collegiate Biology 432019:** Collegiate Biology is the equivalent of a two-semester college introductory biology course for biology majors. The curriculum is laboratory based and includes extensive integration of laboratory technology. Major units of study include cell processes, ecology, evolution and genetics and information transfer. Upon completion of the course, students will be eligible to take the Advanced Placement Biology examination.

**MVGS Biology II: Advanced Topics 432029:** Biology II is a second year college biology course which ties biological principles to social and ethical implications. Students will explore advanced topics which may include genetics and microbiology. This is a post AP level course.

**MVGS Math Analysis 316209:** Math Analysis develops students' understanding of algebraic, trigonometric, exponential, logarithmic and transcendental functions, parametric and polar equations and vectors. Investigating real world data will enhance the understanding of realistic applications through modeling. Graphing calculators, computers, and other appropriate technological tools will be used to assist students. This course serves as the prerequisite for MVGS Calculus I and MVGS Statistics.

**MVGS Calculus I 317519:** Calculus I is a rigorous course in calculus with analytic geometry. Topics include concepts and applications of differential and integral calculus and an introduction of elementary differential equations. Upon successful completion, students will earn dual enrollment credits in calculus and be eligible to take the Calculus AB Advanced Placement examination.

**MVGS Calculus II with Multivariable 315729:** The course is a fast paced calculus course which includes an introduction to multivariable calculus. Topics include concepts and applications of differential and integral calculus and an introduction of elementary differential equations, sequences and series, elementary differential equations, three-dimensional analytical geometry, vector analysis, partial derivatives, optimization, double and triple integrals. Upon successful completion, students will be eligible to take the Calculus BC Advanced Placement examination.

**MVGS Statistics 319109:** This course is a study of descriptive and analytical statistics. Students will learn and apply four broad conceptual themes which include exploring data, planning a study, anticipating patterns, and statistical inference. Students will use statistics as a tool to predict, investigate, and analyze a variety of statistical and research problems. Upon successful completion, students will be eligible to take the Statistics Advanced Placement examination.

**MVGS Humanities 10: The Power of Thought / English 10 114009:** Beginning with philosophical systems of thought, this Humanities course will engage students in an exploration of the philosophical and historical foundations of knowledge against the broader background of Western thought as it applies to classical and modern literature, science, and mathematics. Emphasis is on examining the contributions of key thinkers to classical and contemporary cultural and scientific thought, with an eye toward understanding the shifting nature of knowledge and the folly of certainty. Students will earn one English credit, which will meet the requirement for English 10, including the Virginia Standards of Learning requirements.

**MVGS Humanities 11: The Search for Identity/English 11 115009:** Engaging in an exploration of the human drive for individual identity across cultures and time, this Humanities course will require students to develop an understanding of the concepts of self, maturity, citizenship, and the questionable attainment of perfection. Emphasis is on the themes found in literature, psychology, philosophy, and science which illuminate the quest to establish our identities within the framework of our communities and the broader context of human experience. Upon successful completion of the course, students will be eligible to take the Advanced Placement English Language and Composition Exam. Students will earn one English credit, which will meet the requirement for English 11, including the Virginia Standards of Learning requirement.

**MVGS Humanities 12: Political Philosophy and US Government 244009:** Humanities 12 introduces students to the key philosophies, institutions, policies, and behaviors of the American political system. Students will learn to apply disciplinary reasoning to assess the causes and consequences of political events, interpret data to develop evidence-base arguments, and defend political positions and solutions while cultivating ethical dispositions and leadership skills which can be applied to real-world problems. Upon successful completion of the course, students will be eligible to take the Advanced Placement Exam in United States Government and Politics. Students will earn one US Government credit.

**MVGS Research I: Introduction to Research 011519:** The students' review of literature, analysis of arguments, and evaluation of experiment designs will enable exploration of basic research components. The students will use statistical and technological tools to organize and integrate information, design studies and experiments, gather data, and plan individual research projects.

**MVGS Psychology/Research II 290809:** Students are introduced to the systematic study of the behavior and mental processes of human beings and other animals. They will describe and compare different theoretical approaches to explaining behavior and distinguish between the different domains of psychology. Students explore professional ethics and standards, as well as current issues. The course will prepare students for the Advanced Placement Psychology Exam. The MVGS Independent Research Project is included in the psychology elective. Students will apply principles of effective research by engaging in academic and scientific research through quantitative studies utilizing laboratory experiments, field studies, interviews, and/or surveys. Students will develop oral, written, and technological skills through the presentation and publication of their research.

**MVGS Computer Science I/ Research II 318609:** Computer Science introduces students to the fundamental topics of computing, including problem solving, designing strategies and methods, creating data structures, designing algorithms, analyzing possible solutions, and exploring ethical and social implications of computing. The course will emphasize both object-oriented and imperative problem solving. Upon successful completion, students will be eligible to take the Computer Science A Advanced Placement examination. The MVGS Independent Research Project is included in the CS elective. Students will apply principles of effective research by engaging in academic and scientific research through quantitative studies utilizing laboratory experiments, field studies, interviews, and/or surveys. Students will develop oral, written, and technological skills through the presentation and publication of their research.