



Governor's School for Science, Math and Technology Profile Sheet for Transcripts

Mountain Vista Governor's School is a regional program for academically talented and highly motivated 10th, 11th and 12th grade students from the school divisions of Clarke County, Culpeper County, Fauquier County, Frederick County, Rappahannock County, Warren County and Winchester City. Students are selected to attend MVGS through a rigorous application/screening process. Mountain Vista Governor's School has approximately 70 graduates each year. Of these, 99% are attending a college or university.

Mission Statement: The mission of the Mountain Vista Governor's School is to present a research-based, technology-enhanced, integrated program in mathematics, science, and the humanities. The program will challenge students to reach their full potential as independent thinkers capable of assuming leadership roles in a constantly changing global society.

Vision: The Mountain Vista Governor's School community of learners will engage in the investigation of scholarly knowledge through an active, constructive learning environment. Students will be expected to become fluent in the processes of mathematics and science, reinforced by a deep understanding of the humanities. Through research, students will learn to use standard technological tools for data analysis and authentic problem-solving. Through personal investigation and reflection, students will be challenged to derive meaning from learning. Through practical application, students will strive to reach their fullest potential. Through collaboration with peers, teachers, and mentors, students will generate and communicate useful solutions to problems of the local and global community.

Curriculum Overview: The interdisciplinary curriculum design of Mountain Vista Governor's School challenges students to construct a highly integrated understanding of mathematics and designated sciences. The development of technology and research skills supports students in solving authentic problems in a scholarly and professional manner. The humanities component requires students to analyze the relationship between the arts and sciences and construct a personal philosophical basis for ethical leadership in applying scientific knowledge to challenging real-world issues. Students are graded on a ten-point scale. The school is housed at two sites of Lord Fairfax Community College.

Mountain Vista Contact Information

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Mountain Vista Governor's School Course Descriptions

Most courses are available for college credit through Lord Fairfax Community College.

MVGS Collegiate Chemistry 442009 This 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 successful completion of the course, students may be capable of and suited for the Advanced Placement (AP) Chemistry examination. Dual enrollment option is provided in CHM 111-112.

MVGS Physics 1: Mechanics 451019 This 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 2. Upon successful completion of the course, students may be capable of and suited for the AP Physics C (Mechanics) examination. Dual enrollment option is provided in PHY 241.

MVGS Physics 2: Electricity and Magnetism 452029 This 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 2/3. Upon successful completion of the course, students may be capable of and suited for the AP Physics C (Electricity & Magnetism) examination. Dual enrollment option is provided in PHY 242.

MVGS Biology 1: Collegiate Biology 432019 This 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 may be capable of and suited for the AP Biology examination. Dual enrollment option is provided in BIO 101-102.

MVGS Biology 2: Advanced Topics in Biology 434029 This is a second-year college biology course which ties together biological principles with social and ethical implications. Students will explore advanced topics which may include ecology and microbiology. This course extends beyond the AP level. Dual enrollment option is provided in BIO 150 and BIO 270

MVGS Math Analysis 316209 This course develops students' understanding of algebraic, trigonometric, exponential, logarithmic and transcendental functions, and parametric and polar equations. Investigating real world data will enhance the understanding of realistic applications through modeling.

Graphing calculators and computers and other appropriate technological tools will be used to assist students. This course serves as the prerequisite for MVGS Calculus and MVGS Statistics. Dual enrollment and AP testing options are not provided.

MVGS Calculus 1 317519 This 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 may be capable of and suited for the Calculus AB AP examination. Dual enrollment option is provided in MTH 263.

MVGS Calculus 2/3 317809 This course is a fast-paced calculus course which includes multivariable calculus. Topics include concepts and applications of integral calculus and an introduction of elementary differential equations, methods of integration, sequences and series, power series, Taylor and Maclaurin series, study of polar and parametric functions, three-dimensional analytical geometry, vector analysis, vector functions, multivariate functions, partial derivatives, optimization, double and triple integrals. Upon successful completion, students may be capable of and suited for the Calculus BC AP examination. Dual enrollment option is provided in MTH 264 and MTH 265.

MVGS Statistics 319009 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 may be capable of and suited for the Statistics AP examination. Dual enrollment option is provided in MTH 245.

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 to meet the requirement for English 10 per the VDOE. AP testing option is not provided, but the course is culminating with Humanities 11. Dual enrollment option is provided in HUM 241.

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. Students will earn one English credit, which will meet the requirement for English 11, including the Virginia Standards of Learning requirement. Upon successful completion of the course, students may be capable of and suited for the AP English Language and Composition Exam. Dual enrollment option is provided in HUM 242.

MVGS Humanities 12/US Government: Political Philosophy and US Government 244009 This course introduces students to the key philosophies, institutions, policies, and behaviors political systems. Students will learn to apply disciplinary reasoning to assess the causes and consequences of political events, interpret data to develop evidence-based arguments, and defend political positions and solutions while cultivating ethical dispositions and leadership skills which can be applied to contemporary, domestic, and international problems. Students will earn one US Government credit, which will meet the requirements for Virginia & US Government per the VDOE. Upon successful completion of the course, students may be capable of and suited for the AP Exam in United States Government and Politics. Dual enrollment option is provided in PLS 135 and PLS 241.

MVGS Research 1: Introduction to Research 011519 The students' review of literature, analysis of arguments, and evaluation of experiment designs will enable them to explore 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. AP option is not available. Dual enrollment credit may be offered as PHY 298.

MVGS Economics/Research 2 or 3 280009/280019 Students develop critical thinking skills through the understanding, application, and analysis of micro and macroeconomic concepts and structures. Students will gain an understanding of economics principles as they apply to free markets and global systems. They will develop familiarity with economics models and graphs, scarcity and choices, supply and demand, elasticity, economic performance measures, national income and price determination, the financial sector, factors that affect income and economic growth, and stabilization policies. Students will gain an understanding of their role in the financial markets. This course can be used to meet the Economics and Personal Finance diploma requirement. Upon successful completion, students may be capable of and suited for the AP Macroeconomics Exam. Dual enrollment option is not provided. The MVGS Independent Research Project (Research 2) is included in the economics elective for juniors. The MVGS Capstone Project (Research 3) is included in the economics elective for seniors.

MVGS Computer Science 1/ Research 2 or 3 318609/318619 Fall semester provides a broad introduction to computer science discussing architecture and function of computer hardware, including networks and operating systems, data and instruction representation and data organization. Software, algorithms, programming languages and software engineering using the Python language as well as artificial intelligence, cyber security and theory of computation are key course topics. Spring semester focuses on problem solving methods using algorithms with the Java language, emphasizing structured programming concepts, and data structures. Upon successful completion, students may be capable of and suited for the Computer Science A AP examination. Dual enrollment option is provided in CSC 200-201. The MVGS Independent Research Project (Research 2) is included in the CS elective for juniors. The MVGS Capstone Project (Research 3) is included in the CS elective for seniors.

MVGS Computer Science 2: Topics in Computing/ Research 2 or 3 318629/318639 Fall semester examines the hierarchical structure of computer architecture, focusing on multi-level machine organization and using a simple assembler language to complete programming projects. Included are processors, instruction, execution, addressing techniques, data representation and digital logic. Spring semester examines data structures (including sets, strings, stacks, queues, arrays, records, files, linked lists, and trees), abstract data types, and algorithm analysis (including searching and sorting methods), and objects. Hands-on work is performed in the C++ language. This course extends beyond the AP level. Dual enrollment option is provided in CSC 202 & CSC 205. The MVGS Independent Research Project (Research 2) is included in the CS elective for juniors. The MVGS Capstone Project (Research 3) is included in the CS for seniors.