

High Mountain Institute

Curriculum Guide



Our School & Programs

Our school combines academics and the natural world. We seek to connect ourselves, our students, and our community to the environment in which we live. HMI is not simply an environmental, experiential, or traditional school. We borrow liberally from all three traditions, but also leave ourselves open to the world at large. This allows us to present students with new experiences that they can understand and apply to their lives as a whole.

- The **HMI Semester** is an academic and wilderness semester school for motivated college-bound juniors.
- The **HMI Summer Term** is a five-week interdisciplinary program that combines academic enrichment and wilderness expeditions in the Colorado Rockies.
- The **Apprentice Program** is a professional residency for recent college graduates in traditional and outdoor education.
- The **HMI Gap** is a rock climbing and conservation semester for 18-22 year olds that travels throughout the American West and Patagonia.
- The **High Peaks Adventure** is an introduction to the outdoors and outdoor adventure for middle school students.

Mission Statement

The High Mountain Institute engages students with the natural world. Our school boldly unites rigorous intellectual inquiry, experiential learning, wilderness expeditions, and shared responsibility in a strong community. Our students realize their potential—as leaders, independent thinkers, and thoughtful citizens.

Organizational Structure

The High Mountain Institute is a 501(c)(3) educational organization providing opportunities for leadership growth, intellectual maturation, and self-reliance within a traditional academic and wilderness curriculum.

Core Values

The High Mountain Institute promotes excellence in all levels of school life. Classroom, wilderness, and residential life are fully integrated components of the student experience, and faculty members participate as mentors and guides in all aspects of the semester. This interaction promotes close relationships in the community and leads to greater performance and achievement. Students typically leave the High Mountain Institute invigorated academically, intellectually, and socially and are prepared to lead active, achieving, and curious lives.

Five Core Values Govern Teaching & Learning At The High Mountain Institute:

- Mentorship in and out of the classroom
- Transference of what students learn beyond the High Mountain Institute
- Place- and community-based education
- Processed-based learning that teaches students how to think, not what to think, and conveys a passion for learning
- Integration of the natural world, academics, and residential life

Calendar

Each semester is approximately 110 days long. Students spend five weeks in the backcountry of Colorado and Utah, and over twelve weeks on the Leadville campus. In both settings, students participate in a rigorous curriculum. Formally structured contact hours for all courses meet or exceed those of sending schools (60 hours/semester).

Curriculum Overview

The curriculum at the High Mountain Institute includes traditional academic courses in history, literature, mathematics, Spanish language, and science. Students also enroll in a leadership and natural ethics elective. All classes (Algebra II excepted) are taught at the honors or AP-level. Course titles are as follows:

Required Elective

Practices and Principles: Ethics of the Natural World

English

Literature of the Natural World

Science

Natural Science

History

FALL

United States History

Advanced Placement® United States History

SPRING

United States History: Western Perspectives

Advanced Placement® United States History

Foreign Language

Intermediate Spanish

Advanced Spanish

Mathematics

FALL

Algebra II: Algebra and Functions

Precalculus: Functions

Precalculus: Trigonometry

Precalculus: Functions and Trigonometry

Advanced Placement® Calculus: A

Advanced Placement® Calculus: B

SPRING

Algebra II: Analysis

Precalculus: Trigonometry

Precalculus: Analysis and Limits

Advanced Placement® Calculus: A

Advanced Placement® Calculus: B

Advanced Placement® Calculus: C

Students attend classes six days a week, taking a minimum of five courses. Each class meets for 90 minute sessions four times weekly. Math courses, Spanish, and U.S. History keep students abreast of progress in classes at their sending school. Remaining classes are placed-based and teach grade-appropriate skills.

Assessment

Through the semester, faculty expose students to as many innovative means of evaluation as possible while honoring traditional and widely utilized assessment methods. Practical exams, field studies, and class participation complement quizzes, tests, and research papers in a holistic evaluation of students. Course work is graded on a traditional letter and percentage grade scale. Our lowest passing grade is 60%, a D-. The following grade scale is used at the High Mountain Institute:

A+ (98-100)	A (93-97)	A- (90-92)	
B+ (87-89)	B (83-86)	B- (80-82)	
C+ (73-76)	C (73-76)	C- (70-72)	
D+ (67-69)	D (63-66)	D- (60-62)	F (59-)

Accreditation

The High Mountain Institute holds dual accreditations. HMI is fully accredited by the Association of Colorado Independent Schools (ACIS), a member of the National Association of Independent Schools (NAIS) Commission on Accreditation. HMI is also accredited by the Association of Experiential Education (AEE).

Course Descriptions

Practices & Principles

Practices and Principles: Ethics of the Natural World (P&P) is the foundational course of the High Mountain Institute (HMI) semesters. Focusing on both community and individual growth, P&P exemplifies HMI's motto of "where nature and minds meet." The curriculum consists of three parallel progressions: leadership & community studies, environmental ethics, and technical expedition skills.

On campus, students read and discuss articles on the theory of ethics, environmental ethics, and leadership. These discussions provide a foundation for further thought and reflection while out in the field. The course also provides the majority of the curriculum for the wilderness expeditions. In the field, students participate in a variety of

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classes on leadership, communication, risk management, and technical skills. These discussions complement numerous practical opportunities for students to integrate their learning into life at HMI, both on-campus and during expeditions.

Students are introduced to concepts of philosophical ethics that apply to issues regarding mankind's perception of and dealings with the natural world. The study of both mainstream and alternative philosophical understanding, combined with exploring the world around us allows students to enhance their own personal relationship with the natural world. Utilizing a variety of discussion formats to interpret readings related to Wilderness, nature, environmental ethics, sustainability, animal rights, the value of place, sustainability, etc. students explore what shapes their own personal worldview. In addition to discussions, periodic reflective writing and other assignments (N.B. these vary semester-to-semester) help students think deeply about their relationship with the natural world. They develop resources and skills with which to formulate their own environmental ethic and to articulate and defend these ideas with clarity, consistency and coherence. This exploration culminates in their "Personal Environmental Ethic Presentation" which they deliver to their peers and teachers on the final day of the course.

Technical expedition skills and leadership and community skills are taught primarily in situ during the three expeditions each semester. During the first expedition, students are introduced to the basic field curriculum: they learn the necessary skills to camp and travel comfortably in the backcountry in order to enhance their ability to develop a personal connection to the natural world. These skills include navigation and map reading, self-care in challenging environments, expedition behavior (teamwork, cooking, etc.). During the second and third expeditions, students are challenged to hone and apply these skills. Once they have demonstrated competency in risk management, travel, and communication skills, students may have the opportunity to travel and camp in small groups without direct instructor supervision or to partake in more challenging and technical canyoneering routes with instructors.

Enduring Understandings:

Environmental Ethics

- Every individual has a unique perspective that informs how s/he understands and interprets the world.
- The natural world can be valued in many ways.
- Humans and nature exist in a constant state of interaction, affecting each other in intentional and unintentional ways.

Leadership & Community Studies

- Leadership can take many forms, and effective leadership requires an ability to adapt to context and desired outcomes.
- Leadership and community skills can be taught, practiced, and learned.

Technical Skills

- Backcountry exploration is a means of developing a personal relationship with the natural world
- The simplicity and challenge of traveling safely and living comfortably in the backcountry provides opportunity for reflection and community building.
- The self-reliance necessary for backcountry travel is transferable to "regular" life.

English: Literature of the Natural World

Literature of the Natural World is designed to trace the evolution of the human relationship with the natural world from the settlement of the western frontier to the present time. This course seeks to deepen an understanding of factors that both prevent and encourage environmental stewardship in addition to the role literature plays in creating and reflecting the environmental movement. Students gain a more nuanced view of both their own and their culture's connection to the natural world by examining the failed promises of western frontier, the limits of transcendentalist ideals, the human need to grieve for and memorialize loss, and the desire to find new avenues for further exploration. In the final unit, the course questions what the most effective mediums might be in the information age to promote an environmentally sustainable culture. Throughout the course students will focus on developing their personal writing styles and their proficiency with the writing process.

Enduring Understandings:

- The human relationship to the natural world repeatedly addresses several ideas and concerns that are reflected in literature and contemporary rhetoric.
- Improving our writing is a continual, relational process in which we review and revise our work. The first draft is not the final draft.
- Student-centered learning encourages the development and clarification of ideas supported with evidence.

Science: Natural Science

The Natural Science course is founded on an ecology-based curriculum that strives to spark and drive investigation into the ecosystems of the Southern Rocky Mountains and the Colorado Plateau. Coursework is intended to develop ecological inquiry, observation,

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and analysis of landscape patterns, striving to promote independent understandings around the connectedness of all ecosystem components. Throughout the semester students will actively build upon and compare classroom theory with field studies to begin formulating their own lens to understand and interpret natural landscape patterns and ecological interactions in any place and environment that they explore. Walking away from the course students should be able to engage and connect to the world through an ecological lens that allows them to “think like a mountain” (Leopold 137).

Enduring Understandings:

- Geology can dictate Biology (and vice versa).
- Everything, biotic and abiotic, interacts in dynamic relationships that can influence one another.
- Characteristics of organisms are driven by their ecological environment.
- Science is an active way to cultivate curiosity and interpret observations about the world around us.

United States History (Fall) United States History: Western Perspectives (Spring)

The United States History course is designed to provide students with the analytical tools and enduring understandings necessary to deal critically with the major themes and questions in American history. The fall semester follows a thematic progression through four units that cover the time period from Columbus through the end of Reconstruction. From an initial consideration of the Puritan roots, nineteenth-century political manifestations, and contemporary implications of “American Exceptionalism,” students move on to explore the philosophical and ideological world of the American founding period. A close reading of the Declaration of Independence, Thomas Paine’s Common Sense and other Revolutionary-era documents highlights the contested boundary between liberty and slavery at the heart of classical republican theory. Students then investigate the purposive ambiguities embedded in the American Constitution and study the political battles that defined the nascent nation. Using the competing visions of Alexander Hamilton and Thomas Jefferson as a springboard, students examine how American culture has developed as a product of both individualistic and communitarian impulses. The semester culminates in a debate over slavery and the changing meaning of “equality” in American political discourse. Throughout, students are encouraged challenge prevailing historical interpretations while also creating their own narratives that explain the relationships among historical events and elucidate the broader trajectory of American history.

During the spring term, the class explores American history during the late nineteenth and twentieth centuries through the lens of the American West. Beginning with a close reading and discussion of the strengths and weaknesses of nineteenth-century historian Frederick Jackson Turner’s seminal “frontier thesis,” the course progresses through four units that emphasize the contested nature and unresolved questions of the western past. Students consider and challenge paradigmatic historical binaries such as frontier versus border, place versus process, individualism versus community, and “New” West versus “Old” West, while also considering the role of environment, ideology, race, technology, economics, and politics in shaping the course of western development. To elucidate the links between past and present, this course also examines crucial contemporary issues such as water, land use, and political sovereignty from an historical perspective. Both semesters are driven by class discussion, and students have frequent opportunities to pursue research, develop theses, ask questions, and hone their analytical skills through class projects, presentations and written work.

Enduring Understandings:

- History is a foundational narrative; it provides insight into the origins of our nation and our world and helps us better understand ourselves.
- The ideals that shaped the founding of the United States continue to exert a profound influence over the social, cultural, and economic life of the nation.
- Historical analysis is an inherently biased and subjective enterprise. Challenging traditional or predominant narratives and seeking out alternative perspectives is crucial to thinking critically about the past as well as the present. History is an ever-evolving, dynamic discipline subject to constant scrutiny, revision, and reinterpretation.
- Rhetorically vacuous terms such as “liberty,” “freedom,” and “equality” have meant fundamentally different things to various individuals and groups throughout the history of the United States. Such lofty political ideals have often contradicted the lived reality of a nation founded in conquest and defined by the mixing of diverse cultural groups.
- The way in which we interpret the past informs how we understand the present and often defines our possibilities for the future.

Advanced Placement® United States History

In the Advanced Placement (AP) United States History class, students prepare for the newly revised AP exam in May. The primary course text is America’s History (8th Ed.) by Henretta, Hinderaker, Edwards, and Self; however, students also encounter a variety of primary and secondary source material designed to add depth and highlight the

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interpretive nature of historical inquiry. The fall semester begins with a study of English colonization in North America that focuses on the growing regional divergence of political, social, and economic systems and the ramifications for the future United States. The unit covering the Revolutionary period culminates in a class debate over the historical efficacy of Gordon S. Wood's thesis in his seminal study, *The Radicalism of the American Revolution*. The class then examines the emergence of America as an independent nation through the development of party politics, Jeffersonian Republicanism, and antebellum culture. While underscoring the political and economic changes that accompanied the rise of nineteenth-century Jacksonian democracy, students also consider the abstract and individualistic ethos of northern Transcendentalism in contrast to the strongly literalist foundations of proslavery thought in the South. The semester concludes by considering sectionalism, the Civil War, and Reconstruction through the evolving political rhetoric of "freedom" and "equality."

Students begin the spring semester with the history of Reconstruction, including a close reading and discussion of Robert Penn Warren's *The Legacy of the Civil War*. The late nineteenth and early twentieth-century expansion of industry next provides students an opportunity to consider both the profound possibilities made possible by technology, as well as the ambivalences which marked responses to the American transition to modernity. The class then draws connections between the closing of the western frontier, famously heralded by historian Frederick Jackson Turner, and the increasingly imperialistic tenor of American politics in the late Nineteenth Century. Students analyze similarities and differences between Roosevelt's "big stick" policy, Taft's Dollar Diplomacy, and Wilson's Moral Diplomacy; students also examine the key ideas and limits of Progressivism. The class then moves on to study the connections between World War I, the Roaring Twenties, the Great Depression, and New Deal. Following an examination of World War II, the postwar boom, the Civil Rights Movement, the crises of the 1960s and 1970s, the course culminates with the national emergence of a new Conservatism and the end of the Cold War.

Class discussion serves throughout the term as a major vehicle for understanding seminal events in American history, links between seemingly disparate developments, and the contemporary relevance of historical issues. Assessments include not only the quality and frequency of student contributions to discussion, but also emphasize close textual analysis and clarity of prose. Throughout the semester, students prepare for the AP exam by completing Document Based Questions (DBQ), regular multiple-choice exams, and analytical essays. The demanding AP schedule requires significant self-motivation and discipline from

students, including a considerable reading load to help them prepare for the exam at year's end.

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- Historical analysis is an inherently biased and subjective enterprise. Challenging traditional or predominant narratives and seeking out alternative perspectives is crucial to thinking critically about the past as well as the present.
- Rhetorically vacuous terms such as "liberty," "freedom," and "equality" have meant fundamentally different things to various individuals and groups throughout the history of the United States. Such lofty political ideals have often contradicted the lived reality of a nation founded in conquest and defined by the mixing of diverse cultural groups.
- The way in which we interpret the past informs how we understand the present and often defines our possibilities for the future.

Spanish

Advanced Spanish

The Advanced Spanish course, conducted entirely in Spanish, focuses on the exploration of grammar topics, vocabulary, and incorporation of the four major linguistic skills—reading, writing, speaking, and listening—in order to advance students' language proficiency. During the semester, students will move quickly through a review of familiar verb tenses and grammar topics while also exploring new vocabulary, tenses, idiomatic expressions, and lexical traps. The grammar "nuts and bolts" paired with focused lessons on listening comprehension strategies, reading comprehension strategies, speaking exercises, and timed writing practice will help further develop language skill sets as well as prepare students for the Advanced Placement exam. Specific tasks such as reading discussions, song and newscast interpretations, daily informal conversations, formal debates and presentations, letter writing, and creative writing focused on examining Hispanic immigration to the United States are designed to assess the development of student skills in each of the four major linguistic skills. Students will have the opportunity to look at both historic and present day trends in immigration, uncover global and local motivations for immigration, reflect on some of their own biases, discuss their thoughts about the meaning of "good citizenship," and delve into youth and identity, current immigration policy, and the portrayal of

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immigration issues by different media sources. By the end of the course, students will have honed their skills to further study and explore the Spanish language as well as cultural topics and immigration issues across the globe.

Advanced-Intermediate Spanish

The Advanced-Intermediate Spanish course, conducted almost entirely in Spanish, focuses on the exploration of grammar topics, vocabulary, and incorporation of the four major linguistic skills—reading writing, speaking, and listening—in order to advance students’ language proficiency. During the semester, students will move relatively quickly through a review of familiar verb tenses and grammar topics in order to explore new vocabulary, tenses, idiomatic expressions, and lexical traps. The grammar “nuts and bolts” along with instruction on proper accentuation and pronunciation will support student examination of Hispanic immigration to the United States. Students will have the opportunity to look at both historic and present day trends in immigration, uncover global and local motivations for immigration, reflect on some of their own biases, discuss their thoughts about the meaning of “good citizenship,” and delve into youth and identity, current immigration policy, and the portrayal of immigration issues by different media sources. Specific tasks such as reading discussions, song and newscast interpretations, daily informal conversations, formal debates and presentations, letter writing, and creative writing focused on examining Hispanic immigration to the United States are designed to assess the development of student skills in each of the four major linguistic skills. Weekly vocabulary and grammar assessments will provide information on student understanding of the foundations of the Spanish language. By the end of the course, students will have honed their skills to further study and explore the Spanish language as well as cultural topics and immigration issues across the globe.

Intermediate Spanish

The Intermediate Spanish course, conducted primarily in Spanish, focuses on the exploration of grammar topics, vocabulary, and incorporation of the four major linguistic skills—reading writing, speaking, and listening—in order to advance students’ language proficiency. During the semester, students will move through a review of familiar verb tenses and grammar topics and explore new vocabulary and tenses. The grammar “nuts and bolts” along with instruction on proper accentuation and pronunciation will support student examination of Hispanic immigration to the United States. Students will have the opportunity to look at both historic and present day trends in immigration, uncover global and local motivations for immigration to the United States, reflect on some of their own biases, discuss their thoughts about the meaning of “good citizenship,” and delve into youth and identity, current immigration policy,

and the portrayal of immigration issues by different media sources. Specific tasks such as reading discussions, song and newscast interpretations, daily informal conversations, formal debates and presentations, letter writing, and creative writing focused on examining immigration are designed to assess the development of student skills in each of the four major linguistic skills. Weekly vocabulary and grammar assessments will provide information on student understanding of the foundations of the Spanish language. By the end of the course, students will have honed their skills to further study and explore the Spanish language as well as cultural topics and immigration issues across the globe.

Enduring Understandings:

- Studying a language allows one to better empathize with other cultures (everyday practices, traditions, art, music, literature, folklore, dance, humor), explore new disciplines and knowledge from a broader variety of sources, and thoroughly explore (value/critique) one’s own culture with a more informed lens.
- The building blocks of language—grammar, vocabulary, correct language structures and patterns, tone, phrasing, and appropriate non-verbal cues and gestures—are important to conveying meaning and determine the efficacy with which one communicates.
- Immigration is a complex issue and has a significant effect on the cultural identity of the United States.

Mathematics

Algebra II: Algebra and Functions (Fall)

This course is for students who have studied a full year of Algebra I and are beginning their study of Algebra II. The focus is on improving the student’s ability to manipulate complex algebraic expressions and understanding functions. Algebra II: Algebra and Functions begins with a review of linear equations, including graphing lines and point-slope form. The course includes a review of how to solve basic equations, including linear inequalities and absolute value or radical equations. The students take on a study of multivariable linear systems; they learn to solve these using substitution, graphing, and Gaussian elimination. This unit also includes a graphical study of systems of inequalities. Next, they learn how to solve quadratic equations by factoring, using the quadratic formula, extracting square roots, and completing the square. The students study parabolas by defining quadratics using standard form to determine intercepts, the axis of symmetry, the vertex, and position. The class also studies imaginary and complex numbers. The class is introduced to the concept of functions, including

evaluation, mapping, and graphing. The graphs of functions are analyzed by investigating intercepts, domain, range, discontinuity, and symmetry. Students also learn how to use interval notation. Throughout the semester, the course reviews exponents, rational exponents, the laws of radicals, multiplication and factoring of polynomials, and common algebraic mistakes. Students will be introduced to the importance and broader implications of exponential growth models, found in real life scenarios.

Algebra II: Analysis (Spring)

Algebra II: Analysis is a continuation of Algebra II concepts. Students in this course should be comfortable with all basic algebra skills and will apply these skills to understanding a variety of functions that model the world. Successful completion of this course will allow students to enter a precalculus or statistics class their senior year. Algebra II: Analysis begins a review of the basic concepts of functions, including evaluation, mapping, and graphing. The graphs of functions are analyzed by investigating intercepts, domain, range, discontinuity, and symmetry. Next, students study quadratic functions and parabolas using standard form to determine intercepts, the axis of symmetry, the vertex, and position. Students analyze the graphs of quadratic and rational functions by investigating shifting, reflecting, stretching, intercepts, domains, discontinuity, and asymptotes. Students also learn interval notation during this section. Defining, manipulating, and solving exponential and logarithmic functions are studied next along with graphing, modeling data, and application problems that involved banking, compound interest, growth, and decay. Also, the class works with the family of conic shapes: circles, ellipses, hyperbolas, and parabolas. Students examine the standard equations for these curves and practice graphing these expressions. The final topic is a survey of arithmetic and geometric sequences and series, which includes the factorial function, an introduction to sigma notation, and sometimes an introduction to mathematical induction.

Precalculus: Functions (Fall)

This Precalculus class focuses on manipulating and understanding a variety of functions. It is taught at a higher level and faster pace than Algebra II classes that cover similar material, and incorporates as much first year calculus theory as possible. This class may be the best fit for some advanced Algebra II students. Precalculus: Functions begins with a study of the basic properties of functions. Next, the class focuses on the outputs and graphs of these functions by investigating shifting, reflecting, stretching, intercepts, maxima, minima, domain, range, continuity, and asymptotes. The class studies composite and inverse functions before completing a detailed study of quadratic functions. The class also spends time solving linear, quadratic, and

rational inequalities. The class also studies synthetic and polynomial division and the process of splitting rational functions through partial fractions as ways to understand and manipulate rational functions and polynomials. Defining, manipulating, and solving exponential and logarithmic functions are studied next along with graphing, modeling data, and application problems that involved banking, compound interest, growth, and decay. Whenever possible, first year calculus theory is integrated into this course as it relates to each section.

Precalculus: Functions and Trigonometry (Fall)

This course is for students whose precalculus class at home includes a review of functions, including exponents and logarithms. The second half of the course assumes some previous knowledge of trigonometry from a geometry or an algebra II course and focuses on further exploring this subject. Students who successfully complete this course will be ready to continue precalculus or begin calculus, depending on their previous courses. Precalculus: Functions and Trigonometry begins with a reintroduction to functions, their properties, and how to evaluate them. Next, the class focuses on the outputs and graphs of basic functions by investigating shifting, reflecting, stretching, intercepts, maxima, minima, domain, and range. The class also studies synthetic and polynomial division and the process of splitting rational functions through partial fractions as a way to understand and manipulate rational functions. The course includes a quick review of how to manipulate exponential and logarithmic functions and equations. After reintroducing the six trigonometric functions, the course focuses on the study of inverse trigonometric functions and the ability to solve a variety of real-world problems. Next, the class works on analytic trigonometry, including simplifying and manipulating functions algebraically, verifying trigonometric identities, and solving trigonometric equations. The students also study the law of sines and the law of cosines in terms of their application to engineering problems. Traditionally, the trigonometry unit ends with an introduction to polar and parametric coordinates and equations. Whenever possible, first year calculus theory is integrated into this course as it relates to each section.

Precalculus: Trigonometry (Fall and Spring)

This course is for students whose precalculus class focuses primarily on trigonometry. Students who successfully complete this course will be ready to continue a study in precalculus or begin calculus depending on their previous courses. Precalculus: Trigonometry is a survey of trigonometry and its applications to the real world. The course begins with an introduction to angles using both degree and radian units of measure. The class then studies the six basic trigonometric functions by defining them both from the unit circle and from right triangles. This is followed

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by the examination and manipulation of graphs of the sine and cosine functions. This includes analyzing amplitude, period, vertical shift, horizontal phase shift, and the five key points. After becoming familiar with the trigonometric functions and a few applications, the course focuses on the study of inverse trigonometric functions and the ability to solve a variety of engineering and physics problems. Students also study the law of sines and the law of cosines. The course combines students' knowledge of algebra with trigonometry by proving trigonometric identities and solving trigonometric functions. This usually includes the study and use of sum, difference, multiple-angle, and half-angle formulas. The trigonometry unit ends with a study of polar coordinates and graphing, parametric equations, or vectors.

Precalculus: Analysis and Limits (Spring)

This course is designed to be a second or third semester of precalculus. Most students who take this course will be entering a calculus class the following semester.

Precalculus: Analysis and Limits is a survey of precalculus topics in preparation for entering a calculus course next year. First, the class studies the family of conic shapes: ellipses, hyperbolas, and parabolas. Students examine the standard equations for these curves and practice graphing and manipulating these expressions. The class then shifts its focus to study sequences and series, which includes a review of the factorial function and an introduction to sigma notation. Other topics include geometric sequences and series, infinite series, and the ideas of convergence and divergence. The students learn mathematical induction and its use as a powerful tool for proving theorems. Possible units at this point include the study of matrices, including defining and manipulating matrices and some basic applications, a survey of graphing equations in parametric form, including how to model the motion of projectiles, or an introduction to polar coordinates, equations, and graphing. In the final few weeks, the class sometimes studies part of differential calculus. The analysis of limits and continuity leads directly to the definition of a derivative, differentiability, and the rules for finding derivatives of common functions.

Advanced Placement® Calculus: A (Fall and Spring)

Calculus A is a first semester calculus class that focuses on limits, derivatives, and their applications. Students who take this class in the fall will be able to take the Advanced Placement® Calculus AB test in the spring. Students who take this class in the spring will be prepared to take an Advanced Placement® Calculus BC class the following year. Advanced Placement® Calculus A is a first semester calculus class with a focus on preparing students for the AP Calculus AB or BC exam. The course begins with a quick review of functions and graphing. The class then moves into a study of limits and continuity, focusing both on the definition of a limit and how to calculate limits. This leads

directly into the definition of a derivative, differentiability, and the rules for finding derivatives of common functions. This includes a study of the power rule, product rule, quotient rule, chain rule, and implicit differentiation. After becoming comfortable with derivatives, the class focuses on applications of the derivative. This includes a study of problems utilizing either the physics concepts of position, velocity, and acceleration, the technique of related rates, or how to optimize systems. The class also applies derivatives to the study of the shapes of graphs, concavity, and relative and absolute extrema. The course includes a quick review of exponential, logarithmic, and inverse trigonometric functions before students learn to compute the derivatives of these functions. The class moves into integral calculus by studying antiderivatives and the problem of how to find the area under a curve. These two ideas, antiderivatives and the area under a curve, are combined in the study of the Fundamental Theorem of Calculus.

Advanced Placement® Calculus: B (Fall and Spring)

Calculus B is the second semester of calculus and is designed for students who have taken one semester of calculus at their home schools. Students who complete this class will be prepared to take the Advanced Placement® Calculus AB exam or to continue their study of calculus at their home school to take the Calculus BC exam. Advanced Placement® Calculus B begins with a study of integral calculus by both computing antiderivatives and calculating the area under a curve. These two ideas, antiderivatives and the area under a curve, are combined by the Fundamental Theorems of Calculus. The next part of the course focuses on computing integrals through integration by substitution and numerical approximation of definite integrals through the Trapezoidal Rule. The study of integration continues by studying how to integrate transcendental functions such as natural logarithmic, common logarithmic, and exponential functions. After becoming familiar with a variety of integrals, the class applies the techniques of integration to find the area between two curves, to calculate the volumes of rotated solids, or to understand the physics concept of work. The final unit is an introduction to differential equations. Students study graphical representations of basic equations using slope fields, solved separable differential equations, and approximated solutions using Euler's method.

Advanced Placement® Calculus: C (Spring)

Calculus C is a third semester calculus class. Students taking this course should have completed both Calculus A and B at their home schools and will be prepared to take the Advanced Placement® Calculus BC exam. Advanced Placement® Calculus C is the final semester course in the three-semester progression of college level calculus.

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The course prepares highly qualified students to take the AP® Calculus BC exam in May. The course begins with a review of differential equations if needed, followed by an exploration of advanced integration techniques including integration by parts, logarithmic integration, partial fractions, trigonometric substitution, and evaluating improper integrals. The next unit begins by building on students' knowledge of sequences and series from precalculus, beginning with geometric series and covering numerous methods for determining the convergence or divergence of an infinite series. In this unit, students develop methods for approximating series via partial sums and bounding the error of their approximations. After a thorough treatment of infinite series, the class turns its attention to modeling transcendental functions with Taylor polynomials and power series. In this unit, students create and use a variety of polynomial and series representations of functions, perform operations on series (including differentiation and integration), prove Euler's identity, identify intervals of convergence, and use the Lagrange error bound to analyze the accuracy of Taylor polynomial approximations. In the second half of the semester, the class studies differential equations. Students study graphical representations of basic equations using slope fields, solve separable differential equations, and approximate solutions using Euler's method. This is followed by a brief unit on polar, parametric, and vector-defined functions. Throughout the semester, the class reviews AP Calculus problems from previous years' exams, covering all the major topics on the AP® Calculus BC exam.

Enduring Understandings:

- Most math problems have many ways they can be solved; selecting the right method or tool can often aid in efficiency and accuracy.
- Mathematics can help make sense of patterns, relationships, and the world in general; it sometimes requires making assumptions and accepting error.
- Formulating and solving math questions in the real world takes creativity, perseverance, and discipline.
- Mathematics can be expressed and understood algebraically, graphically, numerically, and in writing.

HMI Summer Term

Calendar

The Summer Term is 37 days long. Students spend just over two weeks in the backcountry of Colorado and the remaining time is spent on HMI's Leadville campus. In both settings, students participate in a rigorous curriculum. Formally structured contact hours for each course are listed below:

Practices & Principles: Wilderness & Leadership: 35 hours
Developing a Sense of Place: 40 hours

Curriculum Overview

The academic program at the Summer Term focuses on developing each individual student's sense of place, leadership skills, and environmental ethic. Our curriculum is interdisciplinary, allowing us to consider topics and ask questions from multiple perspectives. Balancing rigor with fun, the Summer Term is designed for students who are intellectually curious and enthusiastic about learning by doing. Summer Term students take two classes: HMI's keystone course, Practices & Principles, and the core Summer Term class, Developing a Sense of Place: Social & Environmental Science in Colorado's Rocky Mountains.

When on campus, the Developing a Sense of Place course meets for sixteen and a half hours a week. A substantial portion of the P&P curriculum is taught during the wilderness expeditions. In addition, the P&P class meets for ninety minute sessions, two times a week when on campus.

Assessment

Course work is graded using a three tier system to encourage learning for the sake of learning. Most grades will be Satisfactory (S); a few outstanding students will receive Honors (H). Unsatisfactory is graded as (U). Although we provide a numeric equivalency below, letter or number grades (B+ or 88) will not be provided to students.

The following grade scale is used at the High Mountain Institute during the Summer Term:

90 – 100%, Honors Work

70 – 89%, Satisfactory Work

69 and below, Unsatisfactory Work

Accreditation & Transfer of Credit

The High Mountain Institute is accredited by the Association of Experiential Education and the Colorado Association for Independent Schools. Although any public or independent school in the country may support a

student's attendance, member schools enter into a more formal and long-term relationship. The focus of the Summer Term is on academic enrichment. At the end of the summer, students are evaluated and receive comments for both of their courses, as well as a transcript. Credit is granted at the discretion of sending schools.

Course Descriptions

Practices & Principles: Wilderness & Leadership

Practices & Principles is the foundational course of all High Mountain Institute programs, including the Summer Term. The curriculum includes wilderness skills and leadership studies. Learning how to camp and travel in the mountains gives students personal confidence and more comfort in the wilderness, while a carefully crafted leadership development curriculum gives students a leadership "tool box" and helps them develop their own leadership styles.

Developing a Sense of Place: Social & Environmental Science in Colorado's Rocky Mountains

Using environmental science, history, ethics, and literature as our guides, this interdisciplinary course is centered on exploring what it means to have a sense of place. Using Leadville, Colorado as a framework for the study of place, students learn about its rich mining history, conduct ethnographic interviews with local residents, debate the United States' current immigration policy, and examine the science and ethics of humans' impact on the natural world. Science labs are experiential in nature and focus on topics such as the geology of the Rocky Mountains, environmental remediation efforts, the impact of forest fire prevention, and the current pine beetle infestation in Colorado. The course culminates with an independent project where each student reflects on a place that is personally significant to him/her.