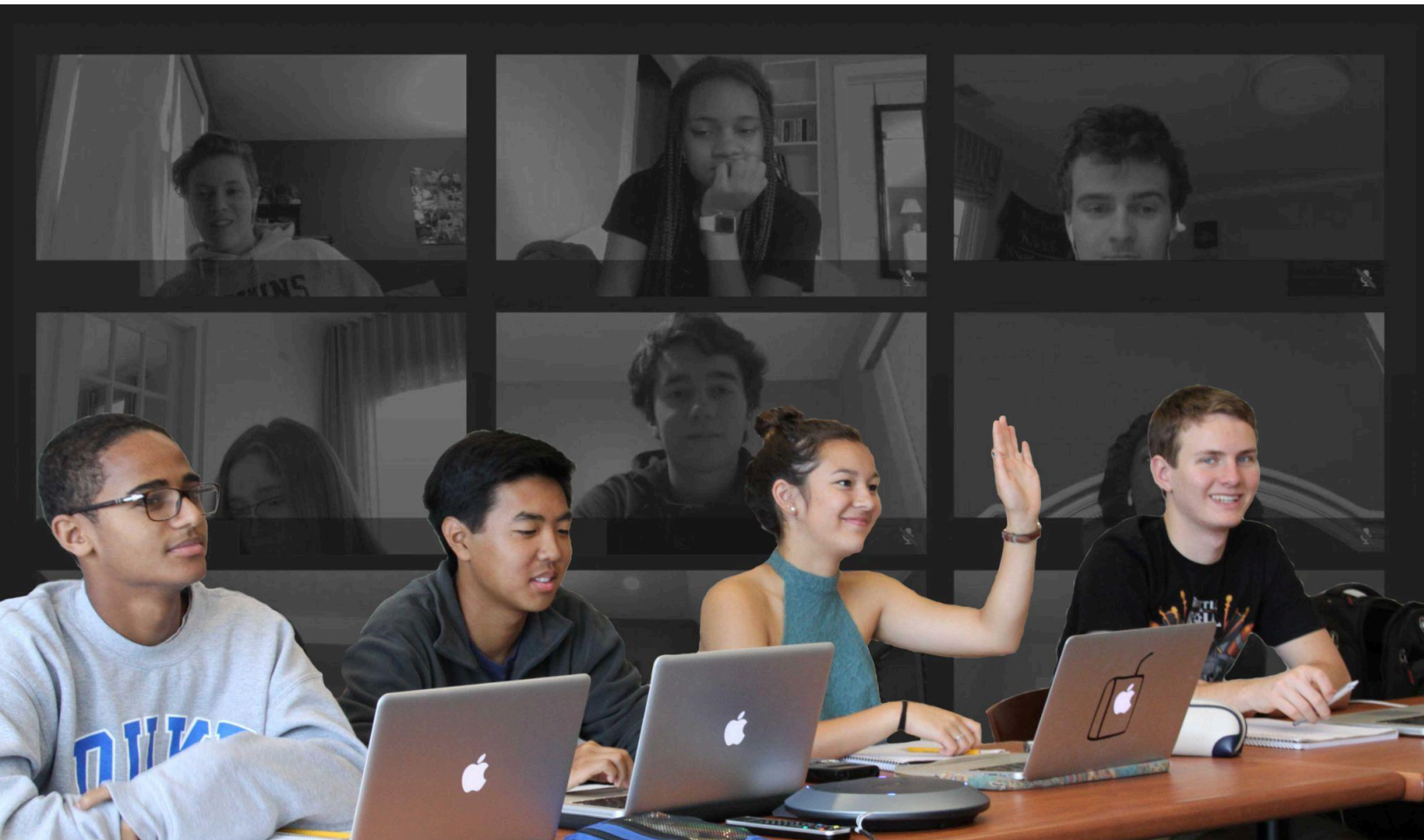




# Course Catalog

2025-2026



# MSON Course Catalog

2025-2026

The Malone Schools Online Network (MSON) provides motivated upper level students at participating Malone Schools with a variety of academically challenging courses that enhance each member school's existing curriculum. These interactive seminars bring students together from across the country with dedicated teachers in real time. MSON joins the best of independent school education with the latest video conferencing technology to chart new territory in online learning.

Students enroll in MSON classes through their schools, which make course requests to MSON by April 15th. Interested students should reach out to their MSON Academic Liaisons for more information and to understand the enrollment processes at their schools. MSON works with member schools to seat students in courses based on the requests of each school, course space constraints, and program goals.

# Participating Schools

2025-2026

Augusta Preparatory School (GA)

The Park School (MD)

Brownell Talbot School (NB)

The Prairie School (WI)

Canterbury School (IN)

Porter-Gaud School (SC)

Casady School (OK)

Roeper School (MI)

Chadwick School (CA)

St. Andrew's Episcopal School (MS)

Columbus Academy (OH)

Severn School (MD)

Derryfield School (NH)

Stanford Online High School (CA)

Fort Worth Country Day School (TX)

Trinity Preparatory School (FL)

Hopkins School (CT)

University School of Nashville (TN)

Manlius Pebble Hill School (NY)

Waynflete School (ME)

Newark Academy (NJ)

Wilmington Friends School (DE)

Maret School (DC)

Winchester Thurston School (PA)

Mounds Park Academy (MN)

# JUMP TO CLASS SCHEDULE 2025-2026

[Link to Course Videos](#)

## Year Long Courses 2025 - 2026

[AMERICAN SIGN LANGUAGE \(ASL \) LEVEL 1](#) \*New\*

[ANCIENT GREEK I](#)

[ARABIC I](#)

[ARABIC II](#)

[DATA SCIENCE](#) \*New\*

[DATA STRUCTURES AND ALGORITHMS](#)

[MULTIVARIABLE CALCULUS](#)

## Fall Courses 2025

[ADVANCED MICROECONOMICS](#)

[AFROFUTURISM AND FUTURES THINKING](#) \*New\*

[BOTANY: ROOTS TO SHOOTS](#)

[EMERGING TECHNOLOGY AND THE FUTURE OF WORK](#) \*New\*

[ETYMOLOGY OF SCIENTIFIC TERMS](#)

[GLOBAL DIVERSITY AND INCLUSION: COMPARATIVE FILM STUDIES AND CROSS-CULTURAL INSIGHTS](#)

[INTRODUCTION TO ORGANIC CHEMISTRY](#)

[LINEAR ALGEBRA](#)

[MAKING ETHICAL MEDICAL CHOICES IN A DIVERSE WORLD](#)

[REEL HISTORIES: LATIN AMERICA'S PAST THROUGH FILM](#) \*New\*

[THE SCIENCE AND ETHICS OF SPORTS PERFORMANCE: GENETICS, BIOCHEMISTRY, AND SOCIOLOGY](#)

[THINK GLOBAL, DEBATE LOCAL](#)

# Spring Courses 2026

[ADVANCED APPLIED MATH THROUGH FINANCE](#)

[ADVANCED TOPICS IN CHEMISTRY](#)

[AFRICAN DIASPORA](#)

[ANATOMY AND PHYSIOLOGY](#) \*New\*

[CSI: MSON - FORENSIC SCIENCE](#)

[DIFFERENTIAL EQUATIONS](#)

[ENVIRONMENTAL BIOETHICS—EXPLORING THE CHALLENGES OF LOCAL AND GLOBAL CHOICES](#)

[INTERACTIVE DIGITAL ART](#) \*New\*

[A MATHEMATICAL MODELING APPROACH TO SOCIAL JUSTICE](#)

[MISINFORMATION, CONSPIRACY THEORIES, AND DIGITAL LITERACY](#)

[QUEER LITERATURE](#)

# Alternating Year Offerings 2026 - 2027

[ADVANCED ECONOMICS I \(FALL 2026\)](#)

[ADVANCED ECONOMICS II \(SPRING 2027\)](#)

# WORLD LANGUAGES

## AMERICAN SIGN LANGUAGE (ASL) LEVEL 1 (YEAR)

*Tuesday/Thursday, 3:35-4:35 pm EST*

**Target Grade Level:** 10-12

**Prerequisite:** None

**Instructor:** Katina Mower, Canterbury School, Fort Wayne, IN

In MSON ASL Level 1 you will learn basic signs, culture, and conversation skills in American Sign Language. In the fall term, the instructor will teach many signs upfront so that you and your classmates can use them conversationally as the class moves forward. In the spring term, you will learn much more about ASL syntax so that you can make sure you're properly conversing in ASL (ASL syntax varies from American English syntax!).

You will not need your voice for most of this class, as "Voices Off" and "No Voice" will be our mantras as we learn to communicate with our hands. You do not need to know any sign language at all before you take this class. We begin at the very beginning, and move at the speed of the class. You will use a purchased text, ASL videos, apps, and hands-on classwork to improve muscle memory and ingrain the language. You will surprise yourself with the amount of language you acquire during class and have fun doing it.

## ANCIENT GREEK I (YEAR) *\*New Day & Time\**

*Monday/Thursday, 4:40-5:40 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** None

**Instructor:** Drew Buchheim, Casady School, Oklahoma City, OK

This is a beginning course for students who have not studied ancient Greek before. Students proceed through a study of grammar and vocabulary to the reading and writing of sentences and short narratives in the language of Athens in the fifth century B.C.E. Selected topics in Greek history and art are also considered.

# WORLD LANGUAGES

## ARABIC I (YEAR)

*Monday/Thursday, 12:15-1:15 pm EST*

**Target Grade Level:** 10-12

**Prerequisite:** None

**Notes:** First of a possible two-year sequence

**Instructor:** Noura Almasaeid, Maret School, Washington, DC

This first-year course of a two-year sequence is an introduction to Modern Standard Arabic, the language of formal speech and most printed materials in the Arab-speaking world, as well as some aspects of the Arabic dialects that are used in daily life. Students will learn to speak and listen to Arabic, develop beginning proficiency in the language while learning about culture in the Arab world. Additionally, students will learn the Arabic alphabet, and will start reading and writing words and progress to simple sentences by the second semester. Through frequent oral and written drills, students will develop their basic communication skills.

## ARABIC II (YEAR)

*Tuesday/Friday, 12:15-1:15 pm EST*

**Target Grade Level:** 10-12

**Prerequisite:** Arabic I or verified equivalent experience

**Instructor:** Noura Almasaeid, Maret School, Washington, DC

This course is a continuation of the introduction to Modern Standard Arabic, the language of formal speech and most printed materials in the Arab-speaking world, and the Arabic dialects (mainly the Levantine dialect). Students will explore various themes such as school studies, daily routine, hobbies, travel, music & poetry, and more. These themes will help develop students' communication in Arabic, in three modes of communication (interpersonal, interpretive, and presentational), while also learning about culture in the Arab world. Moreover, students will progress in their reading and writing skills by learning about sentence structures to form compound sentences and short paragraph

# HUMANITIES & SOCIAL SCIENCES

## AFRICAN DIASPORA (SPRING)

*Monday/Wednesday, 11:05 am-12:05 pm EST*

**Target Grade Level:** 10-12

**Prerequisite:** None

**Instructor:** Quinton Davis, Fort Worth Country Day School, Fort Worth, TX

The African Diaspora course is a study of the voluntary and involuntary movement of African people and culture in the premodern and modern world. It is understood that many significant events have impacted African people and their descendants; however, this fact requires an intentional uncovering of causes and motivations, while analyzing the local and global impacts and effects. The course will focus on questions of imperialism, resistance, postcolonial movements, and anticolonialism.

The course is guided by the question, "How has the African diaspora (with its rich history, diverse cultures, and enduring resilience) shaped and influenced the global narrative of identity, equality, and cultural exchange?" Through a mix of readings, discussions, activities, and assignments to engage students and promote a deeper understanding of the African Diaspora's complex and multifaceted story, students will explore the history, contributions, challenges, and contemporary relevance of the African Diaspora.

## AFROFUTURISM AND FUTURES THINKING (FALL) **\*New Course\***

*Monday/Wednesday, 3:35-4:35 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** None

**Instructor:** Reanna Ursin, Malone Schools Online Network

Students will explore the imaginative world of Afrofuturism and the practical methodologies of futures thinking to envision bold and inclusive futures. The class will delve into Afrofuturism's reimagination of Black identity, culture, and technology, alongside learning and forecasting tools like scenario planning, trend analysis, and systems thinking. This interdisciplinary course encourages critical engagement with history, power, and creativity while empowering students to design actionable, equitable, and visionary solutions for the future. Students will work both independently and collaboratively on projects that blend cultural imagination with strategic foresight.



# HUMANITIES & SOCIAL SCIENCES

## EMERGING TECHNOLOGY AND THE FUTURE OF WORK (FALL) **\*New Course\***

*Tuesday/Friday, 11:05-12:05 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** None

**Instructor:** Meg Harms, Brownell Talbot School, Omaha, NE

This course examines how emerging technologies are reshaping the U.S. labor landscape, with a particular focus on their impact on employment, wages, and economic structures. We will explore artificial intelligence (AI), large language models (LLMs), robotics, and the gig economy—not just in terms of their mechanics and applications, but also their broader implications for the world of work. Additional topics include the effects of automation, the rise of superstar economies, debates around minimum wage, and the role of education in addressing ethical and societal challenges related to technological disruption. Through discussions, assigned readings, presentations, and collaborative projects, students will critically analyze these shifts and consider strategies for career adaptability. The course includes virtual field trips and guest lectures from industry pioneers, providing firsthand perspectives on workforce trends and professional guidance for today's learners.

## ENVIRONMENTAL BIOETHICS - EXPLORING THE CHALLENGES OF LOCAL AND GLOBAL CHOICES (SPRING)

*Tuesday/Friday, 3:35-4:35 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** None

**Instructor:** Ellen Johnson, Wilmington Friends School, Wilmington, DE

This course will focus on such cases as environmental sustainability, global energy and food resources, gathered from sources in literature, journalism, and film. The academic study of ethics examines how people make the decisions. Curricula will build on a foundation of theoretical moral theories, more specifically, how one makes decisions when faced with complex, often controversial, issues. No prior knowledge of philosophy is assumed, however, authentic assessment of students' initial facility with logical analysis will ensure that all students are challenged to grow and deepen their theoretical and practical understandings of the subject.

# HUMANITIES & SOCIAL SCIENCES

## ETYMOLOGY OF SCIENTIFIC TERMS (FALL)

*Tuesday/Thursday, 2:10-3:10 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** None

**Instructor:** Joel Svensson, Winchester Thurston School, Pittsburgh, PA

By teaching the root elements of medical terminology – the prefixes, suffixes, and combining forms of Greek and Latin, this course seeks to not only teach students modern medical terminology, but to give them the ability to decipher the evolving language of medicine throughout their careers. This is in many ways a language course and deals with elements that are used to create terms to meet the specific needs of medical scientists. Students will analyze and define terms, complete practice exercises, learn complex etymologies, explore the history of our understanding of certain aspects of medical science, learn about key figures in science, and connect terminology to specific body systems (e.g. cardiovascular system, the respiratory system, etc.). Essential Questions: how are prefixes, suffixes, and combining forms used to create new words? What are the basics of the cardiovascular, respiratory, and digestive systems? How has the historic development of our understanding of medical science affected the terminology in use today?

## GLOBAL DIVERSITY AND INCLUSION: COMPARATIVE FILM STUDIES AND CROSS-CULTURAL INSIGHTS (FALL) *\*New Time\**

*Tuesday/Thursday, 12:15-1:15 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** None

**Instructor:** Dr. John Aden, Chadwick School, Palos Verdes Peninsula, CA

This course examines the ways our Human Family has sought to create, marshal, contest, and maintain identities through Culture and relations of power. These identities can be appreciated through “lenses of analysis.” The course critically engages the traditional “Big Five” lenses of analysis: Race, Class, and Gender & Gender Expression, Sexual Orientation, and Ability, understanding that Culture serves as an important backdrop against which these identities emerge. Once students appreciate the important ways the Social Sciences have engaged with, written about, and debated these five core modes of analysis, the course expands to incorporate other, equally rich, lenses: age, ableism, intellectual diversity, geographic diversity, cognitive and neurological diversity, and the business case for Diversity, as well as how to study synergistically intertwined phenomena. Film and Critical Film Studies, as well as the role Colonialism has played in the major conflicts of the last 500 years, each serve to enrich student understandings of diversity.

# HUMANITIES & SOCIAL SCIENCES

## MAKING ETHICAL MEDICAL CHOICES IN A DIVERSE WORLD (FALL)

*Wednesday/Friday, 3:35-4:35 pm EST*

**Target Grade Level:** 11-12, or with permission of the instructor

**Prerequisite:** None

**Instructors:** Ellen Johnson, Wilmington Friends School, Wilmington, DE & Joyce Lazier, Canterbury School, Ft. Wayne, IN

The objective of this course is to provide students with the tools and experience necessary to better make difficult, ethical decisions. In order to achieve this, we will study and evaluate critically several different ethical theories including Utilitarianism, Virtue Ethics, and Deontology. Which framework students choose to use as their guide is up to them, but by the end of this course they should be able to defend their choices and ethical decisions clearly. The course strives to develop a cross conversation between two academic disciplines - philosophy (ethics) and biology (medical research, molecular genetics).

This is a collaborative teaching effort between Joyce Lazier (background in philosophy and ethics) and Ellen Johnson (background in biology and genetics), and an evolution of two previously existing courses. Both teachers will be present for all classes, focusing on the growth that comes from a shared discourse.

## MISINFORMATION, CONSPIRACY THEORIES, AND DIGITAL LITERACY (SPRING)

*Monday/Wednesday, 12:15-1:15 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** None

**Instructor:** Justin Quam, Mounds Park Academy, Saint Paul, MN

“Falsehood will fly from Maine to Georgia, while truth is pulling her boots on.” As this line from an 1820 newspaper testifies, there is a long history of truth-stretching, rumormongering, and misinformation in American (and global) politics. Unsupported beliefs about politics and public policy may persist for decades or centuries, even if no evidence exists to back them up.

In this course, we will examine the historical roots of misinformation, disinformation, and conspiracy theories, as well as the psychological factors that make it easier for people to fall prey to ‘facts’ that don’t deserve the label. We will then try to understand what has changed in recent decades to make it easier for misinformation to spread more quickly and in more media than ever before, how that media landscape is continuing to change, and what we can do to be better-informed global citizens in the 2020s.

This may be the class for you if you’re interested in discussing...

# HUMANITIES & SOCIAL SCIENCES

- Why a movement that insists “birds aren’t real” claims to have hundreds of thousands of supporters...
- Whether the Defense Department has convincing evidence of the existence of UFOs...
- How misinformation on Facebook is connected to the preservation of the Amazon rainforest...
- And whether you can ever really debunk a myth.

## QUEER LITERATURE (SPRING)

*Tuesday/Thursday, 1:20-2:20 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** None

**Instructor:** Terence Mooney, Hopkins School, New Haven, CT

What does it mean to be queer? This course offers a few answers to that question in an introduction to literature that expands our thinking about intersecting identities shaping difference and power, historically and in contemporary culture. We will read literature by and about people and communities who identify as LGBTQIA+ to examine and analyze how texts disrupt, subvert, and challenge sexual, gender, and other sociocultural norms and dynamics.

Core texts may include John Lyly's GALATEA, Virginia Woolf's ORLANDO, Audre Lorde's ZAMI, Tony Kushner's ANGELS IN AMERICA, and Maia Kobabe's GENDER QUEER: A MEMOIR. Additional readings may include selections by Sappho, Emily Dickinson, William Shakespeare, Oscar Wilde, Susan Sontag, Jericho Brown, Natalie Diaz, and Jamal Jordan.

## REEL HISTORIES: LATIN AMERICA'S PAST THROUGH FILM (FALL) **\*New**

### **Course\***

*Tuesday/Thursday, 1:20-2:20 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** None

**Instructor:** Nancy Rivas, St. Andrew's Episcopal School, Jackson, MS

This semester-long course will explore the rich history of Latin America through the lens of both feature films and documentaries such as The Motorcycle Diaries, the PBS series Black in Latin America (Cuba, The Dominican Republic, Haiti), Maria: Full of Grace, and others. We will examine significant themes and issues throughout Latin American history, from pre-Columbian times to the present, by analyzing the historical facts and how they have been portrayed in a diverse range of films and documentaries. The course will proceed chronologically through Latin American history, pairing historical context with in-depth discussions of selected cinematic works. Key topics of focus may include stereotypes, pre-Columbian cultures, the Spanish conquest, imperialism and colonialism, the African Atlantic slave trade, revolutionary

# HUMANITIES & SOCIAL SCIENCES

movements, religion, and the role of women. Instruction will be conducted in English, and prior knowledge of Spanish is not necessary.

Please note: students will be responsible for watching films and documentaries outside of class via streaming platforms such as Netflix, Amazon, Youtube, etc.

## THINK GLOBAL, DEBATE LOCAL (FALL) *\*New Time\**

*Tuesday/Thursday, 3:35-4:35 pm EST*

**Target Grade Level:** 10-12

**Prerequisite:** None

**Instructor:** Dan Jacobs, Roeper School, Bloomfield Hills, MI

Water justice. Gentrification. Housing. Education. Race Relations. Public Safety. Environmental Issues. Is it wrong to shut off water service to households that are delinquent on their water bills? Is access to affordable housing a human right? Should environmental issues take priority over the needs of businesses? Do we have an obligation to help asylum seekers? People all around the world struggle with these and other challenges. In Think Global, Debate Local, we use issues in our own neighborhoods to take deep dives into the facts and philosophies underlying the challenges, values, and perspectives that shape our world on scales ranging from the personal to the global.

The overarching goal of this course is for students to teach each other about important topics in their own neighborhoods, towns, states, and regions, and to use debate as a tool to examine the perspectives surrounding those topics. Other goals include achieving a better understanding of complex issues by taking on and arguing for the viewpoints of various stakeholders; discovering ways to shift from an adversarial to a cooperative relationship when disagreements arise; and understanding the ways different values can be used as filters through which a given issue can be viewed. Please note that this course is geared toward beginning debaters with an emphasis on basic argumentation, not competition, although more experienced debaters are welcome

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## ADVANCED APPLIED MATH THROUGH FINANCE (SPRING)

*Alternating Year Offering*

*Monday/Thursday, 10:00-11:00 am EST*

**Target Grade Level:** 11-12

**Prerequisite:** Completion of Algebra II

**Instructor:** Julien Meyer, Severn School, Severna Park, MD

This one-semester course will provide students a mathematical and conceptual framework with which to make important personal financial decisions using algebraic tools. Specifically, the class will investigate i) the time value of money (i.e., interest rates, compounding, saving and borrowing) using exponential functions; and ii) the characteristics and risk/reward tradeoff of different financial instruments/investments, such as stocks, bonds and mutual funds, using algebra, probability and statistics. Other financial algebra topics selected with student input may include financial accounting, depreciation methods and foreign currency exchange.

The course will stress use of the TI-83/84 calculator, Excel spreadsheets and iPad apps. Students should be comfortable with exponential growth models and, preferably, the concept of the number  $e$  for continuous compounding. They should be willing to exhibit an interest in mathematical reasoning and display a hefty dose of curiosity about the language and problem-solving nature of personal finance.

## ADVANCED MICROECONOMICS (FALL)

*Alternating Year Offering*

*Monday/Thursday, 10:00-11:00 am EST*

**Target Grade Level:** 11-12

**Prerequisite:** Completion or concurrent enrollment in Precalculus

**Instructor:** Julien Meyer, Severn School, Severna Park, MD

Advanced Microeconomics is a semester course that covers decisions at the individual consumer, producer and market level. Topics include scarcity, supply and demand, elasticity, international trade and the theory of the firm. The role of the government, both distortive and restorative, in the areas of regulation, public goods, market failures and the environment, will be debated. Students will manipulate economic models and “think like an economist.” While the course does not follow the AP curriculum, students will be positioned, with extra work on their own, to take the AP exam if they wish.

# STEM

## ADVANCED TOPICS IN CHEMISTRY (SPRING)

*Monday/Thursday, 2:30–3:30 pm EST*

**Target Grade Level:** 11-12, or with permission of the instructor

**Prerequisite:** Chemistry

**Instructor:** Jocelyn Rodgers, Maret School, Washington, DC

This semester course explores aspects of chemistry that are often skimmed over or omitted in most chemistry courses—chemical applications and the history of chemistry. Real-world applications abound in areas such as nuclear, medical, atmospheric, industrial, food, water, and consumer product chemistry. We will begin with an exploration of energy sources such as nuclear power, solar power, and lithium ion batteries. We will then explore computing—both the properties of the elements that power the computers we use every day as well as computational techniques that have revolutionized the ability of scientists and students to visualize and understand chemical processes at a molecular level.

Throughout the semester, we also explore the history and life events of scientists who discovered the chemical elements and have impacted the history of the world through chemistry. In independent projects, students will explore the periodic table for daily applications and technologies, from cell phones to photovoltaic cells to medical treatments. This course will be heavy in applications and theory, with less of the traditional problem-solving found in other courses.

## ANATOMY AND PHYSIOLOGY (SPRING) **\*New Course\***

*Tuesday/Thursday, 1:20–2:20 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** Biology

**Instructor:** Joel D'Angelo, Hopkins School, New Haven, CT

This elective explores the structure and function of the human body, focusing on its systems' intricate design and interconnectivity. Topics include the muscular, skeletal, cardiovascular, and other systems, emphasizing their roles in maintaining homeostasis. The course incorporates virtual labs, interactive simulations, and digital dissections to provide hands-on learning. Students will also explore comparative anatomy, examining structures across species to investigate evolutionary relationships and shared adaptations. These activities offer a deeper understanding of human biology and its connection to the broader animal kingdom.

Through discussions, case studies, and projects, students will connect anatomy and physiology to real-world applications. This course is ideal for students interested in biology, health sciences,

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or related fields. Participation in this course will require purchasing approximately \$100 worth of materials, predominantly items from the grocery store such as chicken wings, a filet of fish, etc. Students will have the option to participate in at least one "anatomical dinner" in which class members go online and cook, dissect, and eat (if desired) a common grocery item together.

## **BOTANY: ROOTS TO SHOOTS (FALL)**

*Tuesday/Thursday, 1:20-2:20 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** Biology; Co-Requisite Chemistry

**Instructor:** Joel D'Angelo, Hopkins School, New Haven, CT

This course will be an introduction to the fascinating and diverse world of plants, from the tiniest mosses to towering forest giants, and from exotic orchids to carnivorous species. The course will take a project-based approach to studying the topics of evolution, diversity, structure and function, reproduction, and ethnobotany, focusing on the economic, medicinal, and cultural uses of plants. Students will explore botany through a series of interactive projects and activities to deepen their understanding of how plants fit into the ecosystem, culture, local community, and world around them.

## **CSI: MSON – FORENSIC SCIENCE (SPRING)**

*Tuesday/Thursday, 1:20-2:20 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** Completion or concurrent enrollment in Chemistry or Biology

**Notes:** Lab kit required (sent by teacher)

**Instructor:** Carrie Lopez, Trinity Preparatory Day School, Winter Park, FL

This course is designed for those interested in learning the discipline of forensic science and crime scene investigation. Students will be introduced to some of the specialized fields of forensic science and topics will include: Fingerprint Evidence, Handwriting Analysis, Forensic Anthropology, Forensic Entomology, Bloodstain Pattern Analysis, DNA Evidence, Death Investigation. This class includes a mixture of laboratory experiments, demonstrations, and speakers who are experts in the field.



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## DATA SCIENCE (YEAR) **\*New Course\***

*Monday/Thursday, 4:00-5:00 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** AP Calculus AB

**Instructor:** Don Worcester, Trinity Preparatory Day School, Winter Park, FL

Data Science is an advanced statistics course which focuses on methods for analyzing data. The fundamentals of data science will be taught using the programming language R. Students will be expected to have strong analytical skills and problem-solving abilities. Students will not need any previous programming experience or an introductory statistics course. Any necessary topics from an introductory course will be covered as needed. Topics will include data collection, data exploration and visualization, statistical modeling (linear, multiple, Poisson and logistic regression) and classification modeling (decision trees, confusion matrix, hyperparameters). Additional topics will be covered as time permits.

## DATA STRUCTURES AND ALGORITHMS (YEAR)

*Tuesday/Thursday, 12:15-1:15 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** AP Computer Science A or equivalent experience with the Java programming language

**Notes:** Laptop required

**Instructor:** Steve Young, Derryfield School, Manchester, NH

This year-long course in Java programming starts with a review of some concepts from the AP Computer Science A curriculum, such as inheritance, interfaces, generic types, sorting and searching, and recursion. We extend these ideas, and build larger and more complicated software projects, using data structures - ways of organizing data in programs to maximize efficiency and clarity. You are already familiar with two examples: arrays and array lists. We will explore many other data structures, including linked lists, stacks and queues, binary and balanced trees, heaps, and the union-find. Data structures go hand in hand with the algorithms that we use to work with them, and we will touch on some important ideas in the analysis of algorithms along the way. Course assessments consist primarily of programming projects, and some class time will be allotted for students to work together on these assignments.

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## DIFFERENTIAL EQUATIONS (SPRING)

*Monday/Wednesday, 12:15-1:15 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** BC Calculus

**Instructor:** Don Worcester, Trinity Preparatory Day School, Winter Park, FL

Many processes in our lives can be seen as a rate of change (the rise or fall of a population when a disease is introduced, the trajectory of a launched object under the forces of gravity and air resistance, etc.). In this course we will explore these everyday processes and determine how to model them using differential equations. With this as a motivator, we will develop solution techniques for a wide range of ordinary differential equations. In particular, course topics will include first order differential equations (separable ODEs, exact ODEs, integrating factors, modeling, population dynamics, existence/uniqueness), second order linear differential equations (homogeneous and nonhomogeneous), series solutions to differential equations, Bessel's equation, the Laplace transform, and systems of first order equations (including general solutions via matrix methods), and general operators methods.

## INTERACTIVE DIGITAL ART (SPRING) **\*New Course\***

*Monday/Wednesday, 2:30-3:30 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** Programming experience recommended

**Notes:** Participation in this course will require purchasing approximately \$80-100 worth of materials.

**Instructor:** Chris Dearer, Casady School, Oklahoma City, OK

Art installations like Meow Wolf in Santa Fe and Factory Obscura in Oklahoma City incorporate a number of different media in their construction, including what is known as interactive digital art – art that is built from technology and which responds to the environment or interaction.

In this course, students will learn how to work with some of the basic technology behind these installations, focusing on C++ and the Arduino Ecosystem. Students can expect to get hands-on experience designing and building their own electronic projects that respond to the environment.

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## INTRODUCTION TO ORGANIC CHEMISTRY (FALL)

*Monday/Thursday, 2:30–3:30 pm EST*

**Target Grade Level:** 11-12, or with permission of the instructor

**Prerequisite:** Chemistry

**Instructor:** Jocelyn Rodgers, Maret School, Washington, DC

This semester course will provide useful background information in organic chemistry by covering topics not typically found in high school chemistry courses. The course will give insight into the importance of the chemistry of carbon compounds to our daily lives. Topics covered will include organic nomenclature, structural formulas, stereochemistry, bonding, reaction mechanisms, and chemical transformations of functional groups. Completion of the course should make students more confident in their chemical background when entering college biology or chemistry courses

## LINEAR ALGEBRA (FALL)

*Monday/Wednesday, 12:15-1:15 pm EST*

**Target Grade Level:** 11-12

**Prerequisites:** BC Calculus

**Instructor:** Don Worcester, Trinity Preparatory Day School, Winter Park, FL

A standard treatment of linear algebra as presented to university-level science and engineering majors. Course topics will include row-reduction, matrix equations, linear transformations, matrix operations, invertibility, subspaces of Euclidean space, dimension, rank, determinants (elementary product definition, expansion by minors, and row-reduction), vector spaces, null and column spaces, linear independence, bases, change of basis, eigen-theory, algebraic and geometric multiplicity, diagonalization, inner product, length, orthogonality, orthogonal sets, projections, the Gram-Schmidt process, QR-factorization, and the method least-squares.

## A MATHEMATICAL MODELING APPROACH TO SOCIAL JUSTICE (SPRING)

*Tuesday/Thursday, 12:15-1:15 pm EST*

**Target Grade Level:** 11-12, or with permission of the instructor

**Prerequisite:** Completion of or concurrent enrollment in Precalculus

**Instructor:** Jay Noland, Mounds Park Academy, St. Paul, MN

The main purpose of this course is an introduction to mathematical modeling through graphical, numerical, symbolic, and verbal techniques. We will focus on data from and explore social justice

# STEM

issues such as the Food Deserts, Gerrymandering, Climate Change, and others. We will use elementary functions (polynomial, exponential, logarithmic, etc.) to build models and address questions with the goal of developing scientific reasoning and problem-solving skills. Students will also use technology in a range of ways to effectively communicate their hypotheses and conclusions.

## MULTIVARIABLE CALCULUS (YEAR)

*Monday/Wednesday, 12:15-1:15 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** BC Calculus

**Notes:** Laptop required

**Instructor:** Elena Zaurova, Stanford Online High School, Stanford, CA

The mathematics of three dimensions is the emphasis of this college-level course. Multivariable Calculus will explore the geometry of three-dimensional space, including vector arithmetic. It will also explore three-dimensional surfaces, using the tools of derivatives and integrals expanded into multiple dimensions. A robust unit on differential equations will allow students to review the topics of single-variable calculus. The emphasis throughout the course will be on problem-solving and on real-world applications of the tools students learn in fields such as economics, astronomy, physics, engineering, and medicine.

## THE SCIENCE AND ETHICS OF SPORTS PERFORMANCE: GENETICS, BIOCHEMISTRY, AND SOCIOLOGY (FALL)

*Monday/Wednesday, 11:05 am-12:05 pm EST*

**Target Grade Level:** 11-12

**Prerequisite:** Two years of high school science

**Instructor:** George Flatau, University School of Nashville, Nashville, TN

The essence of competitive athletics revolves around trying to, as the Olympic creed states, perform “faster, higher, stronger,” and athletes have been trying to do so as long as sports have existed. This course aims to examine that pursuit from a scientific perspective - what are the limits of human performance (both “clean” and doped), what role does genetics play, how does technology affect sports, what issues arise when we consider gender and competition - all are among the topics we will discuss.

The course will examine how society and sport have co-evolved, how science has played a key role in that development, and the resulting ethical, equitable, and safety issues that follow.

# STEM

Through readings, viewings, and discussions, through individual and group papers and presentations, we will grapple with often conflicting and complex ideas, grounded in scientific theory and practice, and come to a better understanding of how science and sports are related.

# ALTERNATING YEAR OFFERINGS

## AVAILABLE 2026-2027

### ADVANCED ECONOMICS I (FALL)

*Alternating Year Offering*

*Monday/Thursday, 10:00-11:00 am EST*

**Target Grade Level:** 11-12

**Prerequisite:** Completion or concurrent enrollment in Precalculus

**Instructor:** Julien Meyer, Severn School, Severna Park, MD

Advanced Economics I covers microeconomics, decision making at the individual consumer, producer and market levels. Topics will include scarcity, supply and demand, elasticity, international trade and the theory of the firm. The role of the government, both distortive and restorative, in the areas of regulation, public goods, market failures and the environment, will be debated. While the course does not follow the AP curriculum, students will be positioned to take the Microeconomics AP exam if they wish.

### ADVANCED ECONOMICS II (SPRING)

*Alternating Year Offering*

*Monday/Thursday, 10:00-11:00 am EST*

**Target Grade Level:** 11-12

**Prerequisite:** Completion or concurrent enrollment in Precalculus

**Instructor:** Julien Meyer, Severn School, Severna Park, MD

Advanced Economics II will start by finishing up microeconomic topics such as income inequality and resource markets. Then the course will switch to macroeconomics, the study of an economic system as a whole. Topics will include economic performance measures, price-level determination (inflation and deflation), the financial sector, monetary and fiscal policies, economic growth, productivity, unemployment, and the balance of payments. In both courses, students will manipulate economic models and “think like an economist.” While the courses do not follow the AP curriculum, students will be positioned to take the Microeconomics and/or Macroeconomic AP exams if they wish.

While preference will be given to students who wish to take both Advanced Economics I and II, students may enroll in Advanced Economics II for the second semester on a space available basis if they have already taken a microeconomics course from MSON or otherwise.

## CLASS SCHEDULE 2025-2026

CLASS SCHEDULE 2025-2026 - LIVE DOCUMENT						
All Times EST	Term	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY
10:00 AM - 11:00 AM	Fall	Advanced Microeconomics			Advanced Microeconomics	
	Spring	Advanced Applied Math Through Finance			Advanced Applied Math Through Finance	
11:05 AM - 12:05 PM	Fall		Emerging Technology and the Future of Work			Emerging Technology and the Future of Work
		The Science and Ethics of Sports Performance: Genetics, Biochemistry, and Sociology		The Science and Ethics of Sports Performance: Genetics, Biochemistry, and Sociology		
	Spring	African Diaspora		African Diaspora		
12:15 PM - 1:15 PM	Year	Multivariable Calculus	Data Structures and Algorithms	Multivariable Calculus	Data Structures and Algorithms	
		Arabic I	Arabic II		Arabic I	Arabic II
	Fall	Linear Algebra	Global Diversity and Inclusion: Comparative Film Studies & Cross-Cultural Insights	Linear Algebra	Global Diversity and Inclusion: Comparative Film Studies & Cross-Cultural Insights	
	Spring	Differential Equations	A Mathematical Modeling Approach to Social Justice	Differential Equations	A Mathematical Modeling Approach to Social Justice	
		Misinformation, Conspiracy Theories, and Digital Literacy		Misinformation, Conspiracy Theories, and Digital Literacy		
1:20 PM - 2:20 PM	Fall		Botany: Roots to Shoots		Botany: Roots to Shoots	
			Reel Histories: Latin America's Past Through Film		Reel Histories: Latin America's Past Through Film	
	Spring		Anatomy and Physiology		Anatomy and Physiology	
			Queer Literature		Queer Literature	
			CSI: MSON -		CSI: MSON -	

			Forensic Science		Forensic Science	
<b>2:10 PM - 3:10pm</b>	Fall		Etymology of Scientific Terms		Etymology of Scientific Terms	
<b>2:30 PM - 3:30 PM</b>	Fall	Intro to Organic Chemistry			Intro to Organic Chemistry	
	Spring	Advanced Topics in Chemistry			Advanced Topics in Chemistry	
		Interactive Digital Art		Interactive Digital Art		
<b>3:35 PM - 4:35 PM</b>	Year		American Sign Language (ASL) Level 1		American Sign Language (ASL) Level 1	
	Fall		Think Global, Debate Local	Making Ethical Medical Choices in a Diverse World	Think Global, Debate Local	Making Ethical Medical Choices in a Diverse World
		Afrofuturism and Futures Thinking		Afrofuturism and Futures Thinking		
	Spring		Environmental Bioethics - Exploring the Challenges of Local and Global Choices			Environmental Bioethics - Exploring the Challenges of Local and Global Choices
<b>4:00 PM - 5:00 PM</b>		Data Science		Data Science		
<b>4:40 PM - 5:40 PM</b>	Fall	Ancient Greek			Ancient Greek	