

# Nueva Upper School

2019–2020

## Table of Contents

NUEVA UPPER SCHOOL CURRICULUM OVERVIEW .....	1
CORE CURRICULUM .....	2
Grade 9 Global History: Ancient and Medieval Worlds.....	3
Grade 10 Global History: Europe and the World, 1500–1990 .....	4
Grade 11 American Studies: United States History.....	5
International Relations .....	6
American Government.....	7
Grade 9 English: The Great Dialogue .....	8
Grade 10 English: Landscapes of Self and Other .....	9
Grade 11 English: American Literature .....	10
Seeking Truth in Amalgamation: The Memoir .....	11
Afrofuturism: Black Histories, Black Futures .....	12
This World Is Not Conclusion: Twentieth-Century American Poetry.....	13
Adaptations: From Text to Screen and Stage.....	14
Global Gazing: Contemporary Literature in Translation .....	14
Tales of Monsters and Monstrosity.....	15
Foundations of Science: Chemistry.....	16
Introduction to Experimental Bioorganic Chemistry.....	17
Chemical Engineering.....	18
Drug Design.....	20
Biology .....	21
Physics .....	23
Advanced Mechanics .....	25
Modern Physics.....	26
Environmental Earth Science.....	27
Mathematics at Nueva .....	29
Flow of Math Courses .....	30
Math 1 .....	31
Math 2 .....	33
Math 3 .....	35
Statistics and Probability.....	37
Advanced Statistics A & B .....	38
Single-Variable Calculus .....	39
Multivariable Calculus.....	41
Linear Algebra .....	42
Complex Analysis .....	43
Spanish 1.....	44
Spanish 2.....	45
Spanish 3.....	46
Spanish 4.....	47
Advanced Spanish: Journey through the Labyrinth .....	48
Advanced Spanish: Current Events.....	49
Chinese 2.....	49
Chinese 3.....	50
Chinese 4.....	51
Chinese 5.....	52
Japanese 1 .....	52
Japanese 2 .....	54
Japanese 3 .....	55
Japanese 4 .....	56
Advanced Topics in Japanese .....	58

<b>SPECIAL PROGRAMS.....</b>	<b>60</b>
Physical Education .....	61
Grade 9 Science of Mind .....	62
Grade 10 Science of Mind/Engaged Citizenship.....	63
Grade 11 Science of Mind .....	64
Grade 12 Science of Mind .....	65
Grade 9 Design with Impact .....	66
Grade 10 Interdisciplinary Studies of Science.....	67
 <b>ELECTIVES .....</b>	 <b>69</b>
Nueva Soundwaves.....	70
Jazz Ensemble .....	70
Nueva Steel Drum Band .....	71
Music Design and Production.....	72
Groove Workshop .....	72
Drawing 1.....	72
Printmaking 1.....	73
Advanced Studio Art .....	74
Art and Fabrication 1.....	75
Introduction to Sculpture: Ceramics and Clay .....	76
Painting 1 .....	77
Fall Production .....	78
Cinema Studies .....	79
Journalism.....	80
Yearbook.....	81
California History by Foot, Hoof, and Rail.....	81
Capitalism and the Apocalypse: Realism and Utopianism in the History of American Capitalism .....	82
Postcolonial Latin America .....	82
Speech and Debate .....	83
Introduction to Entrepreneurship .....	84
Introduction to Mechanical Engineering .....	85
Environmental Economics .....	86
Microeconomics.....	87
Philosophy of Consciousness and Personhood .....	87
Social Action Research (SAR) .....	88
Applied Molecular Biology “Research Team” .....	89
Advanced Research Methods (ARM) .....	90
Physics Research .....	91
Differential Equations .....	91
Introduction to Computer Programming .....	92
Computer Internals .....	93
Full Stack Web Development .....	94
Machine Learning.....	94
Advanced Programming Workshop.....	95
Computer Aided Design (CAD) .....	95
Introduction to Fabrication .....	96

# Nueva Upper School Curriculum Overview

Core Areas of Focus	Grade 9	Grade 10	Grade 11	Grade 12	
STEM: Science, Technology, Engineering & Math	Science	Foundations of Science I: Chemistry	Foundations of Science II: Biology Interdisciplinary Studies of Science (ISOS)	Advanced Courses (e.g., Drug Design, Chemical Engineering, Experimental Bioorganic Chemistry, Research: Applied Molecular Biology, Physics with Calculus, Modern Physics, Adv. Mechanics)  Independent Research	
	Technology & Engineering	Design Thinking, Fabrication & Computer Science	Courses including: Fabrication Art, CNC Machining, Robotics, Mobile App Design, CAD, Design Engineering, Computer Science & Programming		
	Mathematics		Integrated and advanced topics, emphasizing mathematical reasoning and intellectual risk-taking, examine foundations of computational thinking, proof & heuristics, programming, geometry, advanced algebra, probability, data analysis & statistics, calculus, and advanced topics in mathematical problem-solving. Classes are taught at "stage not age," including a three-year integrated math curriculum that covers algebraic topology, cryptography, linear algebra, mathematical modeling, single- and multivariable calculus, and calculus-based statistics.		
Global Perspectives in Humanities & the Arts	English Language & Literature	The Great Dialogue: Literary Foundations	Landscapes of Self and Others: World Literature	Integrated Studies in American Literature	Seminars and Independent Study (e.g., 20th Century Drama, Gender & Sexuality in America, Journalism, Shakespeare in the World, The Immortal Gothic Genre)
	History, Social Sciences & Civics	Global History: Ancient and Medieval Worlds	Europe and the World; Global History: Modern Middle East and South Asia	United States History	Seminars and Independent Study (e.g., Conflict in the Modern Middle East, Economic Inequality, Fundamentalisms)
	World Languages		Focus on oral proficiency in second languages (Mandarin, Spanish, and Japanese) in grade 9; ASL offered as elective; Comparative Literature using original text and translations; study of additional languages in grades 10, 11, and 12.		
	Visual & Performing Arts		Performance and studio-based courses in a variety of arts (studio art, music performance, theater, photography, film, fabrication); anchored in Theory-Skills-Practice-Performance framework; during and after school.		
Wellness, Resiliency & Applied Learning	Science of Mind		Principles in cognitive psychology and neuroscience, using a curriculum aiming to meet the needs and concerns of high school students regarding transition and identity, life balance, personal purpose and ethical responsibility, and citizenship.		
	Nueva Quest		Students shape a different Nueva Quest each year or pursue one area of interest over several years. Mentors and internships support improved mastery in areas of interest.		
	Community Engagement, Entrepreneurship & Nature	School & Local Stewardship; Global History; Peru Trip	Environmental & Global Citizenship; Costa Rica Trip	Apprenticeships & Social Entrepreneurship; American Studies Trip	Nueva Quest Culminations; Independent Studies; Senior Trip
	Athletics, Health & Wellness		Robust program promoting social, emotional, and physical benefits of athletics, wellness, and healthy competition. Engagement and enjoyment of lifelong fitness as a result of participation in team and individual sports, interscholastic and club sports, and dynamic fitness classes. Activities include volleyball, cross-country, fencing, yoga, dance, squash, golf, tennis, soccer, basketball, track & field, swimming, rock-climbing, and conditioning.		
	Activities, Advisory, Arts & College Counseling		Student-initiated activities and clubs (e.g., Debate, Future Problem Solving, Spirit and Social Club, Interfaith Club, MUN, game design); arts with practicing artists (choir, jazz performance, and recording studio; classical and modern theater). The college counseling team provides a personalized experience to help each student find a college that best fits their learning style and will help them reach their future goals. Advisories meet biweekly, in groups of ten, to support and develop each student's academic, social, and emotional needs.		



## Core Curriculum



---

## Grade 9 Global History: Ancient and Medieval Worlds



### Overview

The history sequence at the Nueva Upper School begins with a two-semester investigation of the history of human civilization through the lenses of the social sciences. Grade 9 students explore the political philosophy, empires, and religious movements of East Asia and the Mediterranean world. Along the way, they practice analytical writing and develop historical thinking skills that are fundamental to the rest of the courses in the social science sequence and the courses students can elect to take during their Nueva career and beyond.

### Goals

Students in this course will:

- improve their historical knowledge and understanding of the civilizations of the ancient world
- sharpen their reading, speaking, and writing skills
- develop their abilities to critically evaluate and to construct arguments based on various forms of evidence
- hone their capacities for thinking about history causally and analytically
- build media literacy through developing a critical eye for reading primary sources
- advance their proficiencies in collaboration and cooperation
- practice thinking about history creatively and divergently

### Materials

Students will need few materials for this course, but they will need them on a daily basis. The key materials include reading packets, which will be distributed by the teachers and will be available electronically. Additionally, students will need writing instruments and notebooks of whatever form suits them best, as well as their Nueva laptops. In many instances students will not be allowed to use their laptops for taking notes during class, and for this reason they are asked to carry separate notebooks with them each day.

### Homework

Students should expect homework regularly and should make efforts to manage their time and plan ahead for major assignments. Several different types of assignments will be given. Students will be asked to do core readings on a frequent basis, and these readings will serve as the foundation for in-class activities and discussions. Students will also be asked to write formal essays and research papers, perhaps as often as several times a semester. And students will be assigned large-scale projects that will involve multiple components (presentations, written reports, and more.) Because many of these projects will be done in groups, students should be prepared to find time outside of the classroom to work with their colleagues.

### Assessment

Although traditional tests and quizzes may be used to gauge students' grasp of course content, the bulk of the formally assessed work will be written. Because writing is a focus of history and the social sciences at Nueva, students' written efforts will be assessed in terms of both content and form. Although grades will be given for some but not all assignments, students should be prepared to absorb and use the feedback received from all work, graded and ungraded.

The most important major assessment will happen at the end of the academic year. Throughout the two semesters, students will use work from both semesters of this course as well as from their English course in order to build portfolios that represent their best efforts and their intellectual growth. At the end of the second semester, students will defend these portfolios in oral defenses with a committee of Nueva teachers. These oral defenses will serve as both the culmination of students' efforts across multiple disciplines and the final assessment for the course.



## Grade 10 Global History: Europe and the World, 1500–1990



### Overview

This course traces the emergence of the modern international system from 1500 to the end of the Cold War, beginning with the four global centers of power and wealth at the beginning of the early modern period: Europe, the Middle East, India, and China. Students will start with an investigation of the emergence of the European balance of power system and compare it to the consolidation of political power in Ming/Qing China, the Ottoman Middle East, and Mughal India, and explore the effects of the military, maritime, and commercial revolutions on modern government, international politics, and global trade and technological innovation. The first semester ends with an investigation of how 19th century revolutions and technological changes globalized great power rivalry, increased avenues for state power and wealth through industrialization and imperialism, and created new forms of mass politics, setting the world up for the great power conflicts, revolutions, and anti-colonial wars of the 20th century.

The second semester will focus on the massive transformations of the international system in the 20th century, tracing how the centuries-old multipolar world of great powers gave way to the bipolar world of the postwar U.S. and Soviet Union. Over its first two units, the semester will explore the causes and impact of the two world wars on the global system and on the emergence of new regimes and nation-states in the wake of collapsing empires and decolonization and, in its concluding unit, investigate of the challenges of regional and global conflict, state consolidation, and economic development among newly independent nation-states in the Cold War period.

### Goals

Students will:

- expand their knowledge and understanding of global history
- develop their reading, speaking, and writing skills
- improve their ability to critically evaluate and construct arguments based on various forms of evidence, with an emphasis on primary sources
- deepen their ability to consider history causally, analytically, and creatively
- develop confidence participating in and leading class discussions
- build research skills leading up to and culminating in a large research project at the end of the spring semester

### Materials

Key materials include texts and course readings, many of which will be available electronically. Students will use notebooks as well as their Nueva laptops in class.

### Homework

Students will be assigned core readings on a frequent basis, which will serve as the foundation for in-class activities and discussions. Students will write formal essays, research papers, and primary document-based analyses and will produce larger projects involving multiple components (presentations, written reports, and more). As some of these projects will be done in groups, students should be prepared to find time outside of the classroom to work with their colleagues.

### Assessment

Writing well is a major goal of history and the social sciences at Nueva, and students' written efforts will be assessed in terms of both form and content. Most assignments will require students to interpret historical evidence, including both primary and secondary sources, as well as articulate and defend historical arguments. Students will also write occasional reading responses — short reflections on reading assignments written at the beginning of class or for homework.



## Grade 11 American Studies: United States History



### Overview

Nueva's U.S. history course (one of two classes in the American Studies program, along with American literature) aims to provide students with a comprehensive view of U.S. history, from the pre-Columbian period to the present day. In keeping with the school's commitment to interdisciplinary study, the course will emphasize the array of different frameworks used to evaluate history, familiarizing students with social and cultural, political, economic, scientific, and environmental perspectives. There will be a particularly strong connection with the English faculty, who will be focusing on American literature. The two classes will maintain varying degrees of chronological and thematic continuity and will share several readings and assignments.

The course aims to provide students who may have taken no other U.S. history class with content that balances both breadth and depth. This will be accomplished by combining chronological and thematic organization, emphasizing concurrent regional (and sometimes international) developments, and evaluating society not as a cohesive whole but as a complex structure made up of variegated, sometimes conflicting groups with their own, separate experiences. Three themes will be interwoven through the class, allowing students to find connections across social, geographic, and chronological boundaries:

- the evolution of democracy (its definition, ideals, and actual structure)
- emerging "American" identities (crossing race, class, gender, region, and national origin)
- the interrelationship between foreign and domestic spheres (emphasizing America's origins as a contested imperial domain and its rise as a global power)

### Structure

The course is divided into seven units — three in the first semester and four in the second — that emphasize the three major themes:

- Making New Worlds: Encounter, Exchange, and Settlement in the Americas
- Building New Nations: Enlightenment, Transformation, and Expansion in North America
- Constructing (and Re-Constructing) a Democracy: Debates and Divisions over "Liberty" and "Equality"
- Growth of an Industrial Giant: The North, South, and West in a "Gilded Age"
- Rise (with a Few Falls) of a Global Power: Spreading, Celebrating, and Questioning American Values
- Exercising Superpower: Foreign and Domestic Struggles over American Democracy and Culture
- Negotiating Globalization: Responses and Reactions to Social and Global Transformations

### Goals

The course goals include familiarity with secondary and primary sources from across multiple disciplines. Students will also be instructed to approach history not as a concrete discipline with immutable facts to memorize, but as a fluid, constantly evolving perspective on our past that shifts according to the values, views, and biases of a particular time period. By thus comprehending the contingent nature of history, students will develop the skills to critically engage with sources and historical arguments, formulate their own connections between historical events and theories about cause/effect, and construct informed arguments and debates about historical phenomena and processes. In this way they will develop their reading, research, and analytical skills as well as their oral and written expression. Finally, they will be encouraged to apply historical content and skills not only to their other classes but to their evaluation of present-day developments in both the United States and the wider world.

Above all else, students are expected to have a deep understanding of three core elements of history: First, cultural, social, and political relationships must be contextualized within time and place; second, history is "multicausal" and many different factors shape the developments and events that lead to the present; finally,



# Core Curriculum

interpretations of the past are contingent and never complete, and the evidence used to understand history should always be viewed critically and with a healthy heap of skepticism.

## Homework, Assignments & Assessment

The course goals will be met in three ways:

1. Class content: Students will be expected to take notes on and to participate frequently in Socratic lectures, presentations, debates, and discussions.
2. Readings: These include a foundational textbook, *U.S: A Narrative History*, as well as a course reader that contains a variety of secondary and primary source excerpts. Students will also occasionally have a joint reading assigned for their U.S history and American literature classes. These readings will form the bulk of the homework, and students will be expected to keep current for class discussions, homework quizzes, and major assessments.
3. Assessments: Assessments will include various group projects, analytical essays, presentations, and debates, as well as a final research paper. This final paper, which will be the year's culminating piece, will include smaller assignments such as a prospectus, outline, and first draft, as well as peer reviews.

Students will work on many of these assignments during our limited class time but should be prepared to devote significant outside time to their completion.

## Materials & Resources

Students have one foundational text: *U.S: A Narrative History, Volumes 1 and 2*. The course reader will include a broad range of primary and secondary sources from across disciplines, including poems, speeches, artistic pieces, scholarly articles, scientific studies, and more.

Students should bring their laptops to class for days that require research, and they should have binders with lined paper as well as rings and folders for inserting documents. The binder will be useful for note-taking; for storing the various hand-outs, assignments, and excerpts provided in class; and for any materials they gather in their own research.

---

## International Relations



### Overview

Why has war been such a dominant force in human history? Is the world simply an anarchic collection of self-interested states, or does an international society exist that might one day eradicate global conflict? Why do some states fail and degenerate into ethnic and sectarian strife? Can economic integration create peace? These are some of the central questions of international relations, a subfield of political science. In this course we will study the major theories of this discipline, including key works from the realist, liberal, and constructivist schools of thought, and examine case studies from 1945 to the present day, spanning Russia, Europe, Latin America, Asia, Africa, the Middle East, and of course the United States. Major topics will include an introduction to foundational texts of realism, liberalism, and constructivism (from Thucydides and Morgenthau to Jervis and Wendt), security and cooperation, alliances and the international system, law and international institutions, the uses of force, terrorism, nuclear proliferation, international political economy and globalization, and interventionism.

### Goals

Students will:

- expand their knowledge and understanding of international relations theory and practice
- develop their ability to critically evaluate and construct policy arguments based on evidence drawn from primary and secondary source research



- deepen their ability to consider international politics causally, analytically, and creatively
- develop confidence participating in and leading class discussions
- complete small policy-writing and research assignments during each semester and one large policy simulation at the end of the semester

## Materials

Key materials include texts and course readings, many of which will be available electronically. Students will use notebooks as well their Nueva laptops in class.

## Homework & Assessment

Students will be assigned core readings on a frequent basis, which will serve as the foundation for in-class activities and discussions. Students will write policy briefs and memos based on historical events as well as near-future, real-world scenarios and simulations, and will produce larger projects involving multiple components (presentations, written reports, and more). As some of these projects will be done in groups, students should be prepared to find time outside of the classroom to work with their colleagues.

Writing effectively is a major goal of history and the social sciences at Nueva, and students' written efforts will be assessed in terms of both form and content. Assignments will require students to interpret evidence, including both primary and secondary sources, as well as formulate and defend policy recommendations.

Comments, questions, and ideas are welcome!

---

## American Government

Grades 11 and 12



### Overview

The course begins with a study of the ideas behind the Constitution and the compromises it contains. The legislative, executive, and judicial branches will be discussed in turn, with case studies of executive, legislative, and judicial action. We'll have a unit called "politics outside government" (movement studies, community organizing, et al.). This semester, we will also interrupt the main flow of government study with discussions of the election.

### Goals

Students will have a working knowledge of American government — what's in the Constitution, what is not there, how Congress works, how judicial review operates. Additionally, I expect that students will get plenty of practice in "thinking outside the box" — challenging the assumptions of American government, considering and creating alternatives, understanding the political theory that underlies the practice.

### Materials

Students may and should take notes on laptops or on paper, as they prefer. No textbook; readings are almost exclusively online documents, papers, and book chapters.

### Homework & Assessment

Reading is assigned regularly; students should be ready to discuss that reading each day. There will be occasional traditional quizzes, announced in advance, on the particulars of the Constitution, specific court cases, and statutes. The three 750-word essays are more important. There will also be a longer paper/presentation in which students attempt to make an argument or answer a significant political question. Advance drafts and consultation with the instructor on these projects are strongly encouraged.



Students should consult with the instructor if they think they might miss a deadline. Absent illness or some true emergency, late work results in significant penalties on the “habits of learning” rubric. Rewrites or redo’s may be granted in certain instances, but they are not presumptive.

---

## Grade 9 English: The Great Dialogue



### Overview

English 9 students study and discuss key works of Western culture — stories that explore values, philosophies, and aesthetics. Essential questions will include the following:

- Why do we tell stories?
- How do the stories we tell reflect our identities and culture?
- What does it mean to be human?
- What does it mean to be good? To be evil?
- How do the concepts of good and evil inform our humanity?

Fall semester is devoted to an intensive study of *The Odyssey*, divided into three thematic units: Stranger/Traveler, Hell, and Homecoming. Within these units, students will read and analyze a number of shorter texts that correspond to and illuminate *The Odyssey*. A ninth-grade English reader, provided to the students, includes works by authors such as Dante Alighieri, Margaret Atwood, James Baldwin, Rita Mae Dove, and Adrienne Rich. Spring semester will build upon the enduring questions introduced in fall semester, as we read Shakespeare’s *Tempest*, Mary Shelley’s *Frankenstein*, and Kazuo Ishiguro’s *Never Let Me Go*. As each of these texts is deeply invested in the cultural effects of scientific discovery, a parallel endeavor will be to track each text against the historical landscape of its author. We will conclude the semester by reading short stories and poems from Latin America to prepare for the Peru trip. In both semesters, students will learn to analyze literary texts and construct intellectual arguments as they become better readers, writers, collaborators, and critical thinkers.

### Goals

Our goals in ninth-grade English are to build essential skills in reading, writing, critical thinking, and collaborative dialogue while expanding cultural literacy. As they engage with a variety of genres, such as epic, lyric poetry, drama, and novels, students learn how to:

- recognize formal structures and genres in literature
- situate texts in relation to literary traditions and/or historical contexts
- approach a difficult text — what strategies to use
- write an essay with a thesis and evidence to argue for an interpretation
- use writing mechanics, structure, and style to articulate ideas
- develop and use a writing process (prewriting, writing, and revising)
- use writing as a tool for thinking
- dialogue about ideas in a class discussion
- give and use feedback productively
- ask good questions

### Homework & Assignments

Students will have reading and/or writing homework to prepare for most class meeting. Students will learn to reflect on their reading through annotations and other short writing assignments. For larger writing assignments, we will focus primarily on writing analytical essays in order to practice the fundamentals of argumentation and organization. We will build to longer, more complex essays as the year progresses. Through analytical writing assignments that build sequentially, students learn the importance of revision and iteration. At the end of the year, students will choose six writing assignments to revise for a digital portfolio of their best



# Core Curriculum

writing. As part of the portfolio project, students will participate in an oral defense of their ideas with two or three faculty members. Throughout the semester, students will also complete projects aimed at developing their individual voice and creativity.

## Assessment

Students will receive ongoing verbal and written feedback on their developing skills. For writing assignments, students will be given two forms of feedback: a comment from the instructor and a rubric that will assess the development of their writing skills. Students will also learn how to assess their own skills and progress using the rubric. For the portfolio project at the end of the year, students will receive verbal feedback in a meeting held immediately after their defense. Both students and parents will receive formal midterm and end-of-semester evaluations to help keep track of progress toward all course goals.

## Materials

Students will need a notebook for note-taking and a durable folder or 3-ring binder to keep track of their English handouts and other materials. They are expected to bring their text (reader or book) to class every day (distributed by their teacher at the start of each unit).

---

---

## Grade 10 English: Landscapes of Self and Other



### Goals

Our goal in tenth-grade English is to expand and deepen skills in reading, writing, critical thinking, and collaborative dialogue. Through encounters with a variety of literary texts, students will develop more sophisticated ways to analyze literary works and their devices; use writing mechanics, structure, and style to articulate ideas in various modes of writing; and communicate ideas to others. Another goal of English 10 is to examine and understand relations of culture, identity, and power by focusing on literature produced outside the West.

### Overview

In English 10, we will dive more deeply into issues raised by colonialism, post-colonialism, and globalization. We will ask essential questions, such as: How do cultural and environmental locations inform who we are and how we see others? As we encounter new landscapes, peoples, and worldviews, how do our understandings of self, other, and place transform? In the fall, we will look at how sociocultural contexts shape perspective and what happens when differing perspectives collide. We will read *A Small Place* by Jamaica Kincaid; *Heart of Darkness* by Joseph Conrad; excerpts from African authors including Chinua Achebe, Buchi Emecheta, and Flora Nwapa; and other essays, poems, stories, and literary criticism. In the spring, our studies of self and other will engage with topics in environmental studies, such as tourism, conservation, and environmental justice. Both semesters, students will read a wide variety of literary modes and genres and learn how to analyze style, tone, rhetorical modes, and literary form. Students will write analytical essays with evidence-based arguments, while also writing rhetorical essays that ask them to experiment with different voices and intended audiences.

### Homework & Assignments

Students will have reading and/or writing homework to prepare for each class meeting. Students will learn how to reflect on their reading through annotations and other short writing assignments. For larger writing assignments, students will continue to write analytical essays, but the types and modes of assignments will expand to include new persuasive strategies such as writing with voice, tone, and rhetorical purpose in mind.

### Assessment

Students will receive ongoing verbal and written feedback on their developing skills. For major writing assignments, students will be given two forms of feedback: a comment from the instructor and a rubric that will



# Core Curriculum

assess the development of their writing skills based on the course template. Students will also learn how to assess their own skills and progress using the template. Students and parents will receive formal midterm and end-of-semester evaluations, including course templates, to help keep track of progress toward all course goals.

## Readings

In the fall, our course readings will include short stories, poems, and essays that introduce colonial and postcolonial literature: "The I Is Never Alone" by Marcel Marien, "The Bird-Dreaming Baobab" by Mia Couto, and "White Man's Burden" by Rudyard Kipling (in addition to accompanying satirical responses). Major texts include *A Small Place* by Jamaica Kincaid and *Heart of Darkness* by Joseph Conrad. In the spring, students will begin the semester with Arundhati Roy's postcolonial novel *The God of Small Things*, followed by readings in environmental studies that prepare students for the tenth-grade trip to Costa Rica, including selections from Charles Darwin's *Voyage of the Beagle*, Rachel Carson's *Silent Spring*, and Rebecca Giggs's "Whale Fall." In addition, we will read short stories by Costa Rican authors, and we will end the year with a unit on eco-poetry.

## Materials

Students will need a notebook for writing and may want a three-ring binder to keep track of their English handouts and other materials. Each student will be expected to bring to class the relevant text(s) on which we are working.

---

## Grade 11 English: American Literature



### Overview

The particular focus in this course is the rich and varied history of American literature, from precolonial writings to the 21st century. Throughout the year, we will have the opportunity to examine and reflect on the complex interplay between literature (and other cultural forms) and the historical and political forces that shape it. The course is designed to also integrate with History 11, American History, so students will be able to make deep interdisciplinary connections in course discussions and essays. The overarching question for the course is "What stories do we tell ourselves as Americans, and why?"

Readings of diverse texts (in genre, period, author's background, etc.) — from Native American poetry and early Gothic fiction to modernist novels and postmodern plays — will encourage students to respond to this question through three key lenses (enduring understandings):

1. American identities are shaped by a multitude of voices, cultures, and actions that are often in conflict with each other.
2. American literature is a product of historical dynamics that continue to resonate today in new ways.
3. American literary forms reflect the changing notions and needs of a democratic society.

### Goals

The goal of English 11 is to reflect on why and how Americans tell the stories they do and to foster more independent and interdisciplinary thinking and research in students. English 11 builds on key disciplinary skills developed in English 9 and 10 — including analytical writing, close reading, rhetorical analysis, and public speaking — while also building more sustained interdisciplinary writing and thinking skills through a close collaboration with History 11.

### Homework

Students will annotate texts as they read to prepare for class discussions and activities. Larger projects will include analytical essays, creative writing, and interdisciplinary work with history.



# Core Curriculum

## Assessment

As students make their way through American literary history, they will respond to texts and contexts through a variety of performance tasks that will be assessed by rubrics and teacher comments. Students will also gain real-world practice in literary analysis by responding to the work of a professional critic of American literature.

## Materials

Major works might include the following:

Arthur Miller, *The Crucible*

Frederick Douglass, *Narrative of the Life of Frederick Douglass*

Nella Larsen, *Passing*

Louise Erdrich, *Tracks*

Other excerpts and selections from works might include:

Native American stories

Various poems by Langston Hughes

Early American sermons

Various poems by Countee Cullen

Captivity narratives

Various poems by Sylvia Plath

Slave narratives

Allen Ginsberg, "Howl," "A Supermarket in California"

Whitman, *Leaves of Grass*

Various poems by Gwendolyn Brooks

Irving, "Sleepy Hollow"

Joan Didion, "Slouching Towards Bethlehem"

Hawthorne, "Young Goodman Brown"

W.E.B. DuBois, "The Souls of Black Folk"

## Seeking Truth in Amalgamation: The Memoir



### Overview

What is the status of “truth” in the stories we tell about our lives? What can memoir teach us about the nature of memory? Why do we need stories to make meaning? As we investigate these questions together in this course, we will read and interrogate essays, excerpts, and entire texts that fit within the memoir genre. Rivaling the novel, the memoir has risen through the literary ranks as a preferred genre for capturing and exploring identity. Increasingly innovative, memoir often defies traditional narrative forms, blurring boundaries between reality and invention, fact and fiction. Our work will be to investigate those amorphous spaces of the texts we read together.

### Goals

Students will explore the following enduring understandings:

- Recalling and recounting memories necessitates some amalgamation of fact and fiction.
- All literature is a product of historical and social dynamics.
- We all have stories worth sharing.

### Materials

There will be some opportunity for individual selections of texts during our opening book group unit of study, but we will also ground our discussions and thinking in shared readings throughout the semester. We will read the following full-length texts (in addition to other short excerpts from other memoirs):

- J.D. Vance's Hillbilly Elegy
- Paul Kalanithi's When Breath Becomes Air
- Alison Bechdel's Fun Home: A Family Tragicomic



## Homework & Assessment

Students will have reading and/or writing homework to prepare for each class meeting. Students will also complete assessments that will likely include working alone or in pairs to teach a class period on a memoir text, writing a close reading of an extract from a text, writing an essay that analyzes the narrative devices and impacts of a writer's work, completing a creative project that includes writing a personal narrative, and, finally, exploring graphic narrative creation during our final unit of study. Students will receive ongoing verbal and written feedback on their ability to synthesize close reading and historical and cultural context. For major writing assignments, students will be given two forms of feedback: a comment from the instructor and a rubric based on the course template that will assess the development of their writing skills.

---

## Afrofuturism: Black Histories, Black Futures



### Overview

From W.E.B. DuBois to Octavia Butler to Janelle Monae, Black artists have been reimagining the past while simultaneously envisioning a far different and more just future. This course will delve deeply into the historical roots and contemporary expressions of this complex intellectual, aesthetic, and theoretical framework while grappling with its many manifestations in literary, artistic, and pop cultures. We will examine how Afrofuturism as a framework helps us to understand the history of racial injustice, the legacies of colonialism, Black liberation movements, pan-Africanism, science fiction, and futurism. The course will necessarily speak to the ways race intersects with ethnicity, gender, class, sexuality, and ability in the past, present, and future. We will explore all of the above through text, film, music, and art including substantive works by Janelle Monae, Octavia Butler, Nnedi Okorafor, and Jordan Peele. We will also look at key critical theory — critical race theory, queer theory, postcolonial theory, and feminist theory — that will help inform our critique and analysis of these works.

### Goals

Students in this course will develop a deep knowledge of Afrofuturism as a framework and genre. Together we will explore the following essential questions:

- Who is the future for?
- How, when, and why do the past, present, and future intersect?
- How does Afrofuturism explore/expose significant sociopolitical, cultural, and environmental concerns?
- What are other perspectives/lenses that might broaden or challenge what we understand about a text?

### Homework & Assessment

Students will have reading and/or writing homework to prepare for each class meeting. Students will also complete assessments that may include writing an analysis of a chosen text from a particular theoretical lens, writing a literary analysis essay, or completing a creative project.

### Materials

- Course anthology — short stories from the Afrofuturist tradition
- Course anthology — critical and theoretical readings
- Kindred, Octavia Butler
- Binti, Nnedi Okorafor
- Rosewater, Tade Thompson



## This World Is Not Conclusion: Twentieth-Century American Poetry



### Overview

This course will survey the wide array of poetic modes explored by 20th century American poets. We will begin the semester with readings in contemporary issues surrounding canonization and anthologization. We will then study the implications and underpinnings of modernism in the early 20th century, a movement that encompassed surrealism, objectivism, imagism, futurism, cubism, dadaism, and expressionism, among other -isms. Students will survey Modernist poetry through in-depth study of their own choices of poets, studying not only specific works by these writers, but also the writers' historical and cultural contexts. We will then look at other 20th century trends and schools through in-depth study of several postmodern poets, including Muriel Rukeyser, Frank O'Hara, Harryette Mullen, and Lyn Hejinian. This course will ask students to do close readings of poems, to connect poetry to its historical and cultural contexts, and to work on creative projects that may involve (but will not require) writing some poetry.

### Goals

We will frame our study of 20th century American poetry through the following essential questions:

- What are the historical, cultural, and social implications of formal reinventions in poetry?
- How do 20th century American poets respond to historical events and to each other?
- How does American poetry reflect the heterogeneity of our culture and population?

### Homework & Assignments

Students will have reading and/or writing homework to prepare for each class meeting. Students will also complete assessments that will include working in small groups to teach a class on a Modernist poet; writing a close reading of a poem; writing a *New Yorker*-style book review; and, finally, completing a creative project that may include writing poetry.

### Materials

Students will need a notebook for note-taking and may want a three-ring binder to keep track of their handouts and other materials. Each student will be expected to bring the relevant text(s) on which we are working to class. Texts will include packets prepared by the instructor, in addition to *Selected Poems* (Frank O'Hara), *My Life* (Lyn Hejinian), and *Sleeping with the Dictionary* (Harryette Mullen).

### Assessment

Students will receive ongoing verbal and written feedback on their ability to synthesize close reading and historical and cultural context. For major writing assignments, students will be given two forms of feedback: a comment from the instructor and a rubric based on the course template that will assess the development of their writing skills. Students will also learn how to assess their own skills and progress using the template. Both students and parents will receive formal midterm and end-of-semester evaluations, including course templates, to help keep track of ongoing progress toward all course goals.



---

## Adaptations: From Text to Screen and Stage



### Overview

As our course title suggests, we will read a selection of what have been deemed adaptations. We will consider how these original forms are adapted and what is gained or lost in the process. We will also explore the various uses of narrative and aesthetic techniques to inform our understanding of the authors' innovation and our own craft as writers.

In this semester, your primary charge will be to closely analyze texts and films as a means to construct sophisticated arguments. Beyond building your skills as students of literature and culture, you will be responsible for examining an adaptation of your choice as well as crafting your own adaptation.

### Goals

Together we will explore the following essential questions:

- What does it mean to adapt a story?
- What elements are necessary for a successful adaptation?
- How does form influence function?
- How do the stories we tell represent various identities and cultures?

### Homework & Assessment

You will have several opportunities to demonstrate your understanding of our course materials. Here are some modes in which you will be assessed:

- 1 or 2 short close readings of a selected shared text/adaptation
- 1 lesson plan based on an adaptation of your choice
- 1 analytical essay with critical theory of an adaptation of your choice
- 1 adaptation of your own creation (this will be your final project in the course)

### Readings

- *Ghostworld* by Daniel Clowes
- *The Hate U Give* by Angie Thomas
- *Crazy Rich Asians* by Kevin Kwan
- *Stories of Your Life and Others* by Ted Chiang
- *Save the Cat* by Blake Snyder

---

## Global Gazing: Contemporary Literature in Translation



### Description

The echo chamber is our safest habitat, convincing us that our place in the world (our language, our culture, our political identity) knows us best. But what if the range of our humanity extends no further than the terms on which we immediately understand things? This course aims to increase the ways in which we see ourselves by delving into literature created outside the English-speaking world. We will study five relatively short works, uncovering the site of our humanness in divergent geographical and literary spaces. Our texts will be Han Kang's



# Core Curriculum

*The Vegetarian* (Korean); José Saramago's *The Cave* (Portuguese); Svetlana Alexievitch's *Zinky Boys* (Russian); Boualam Sansal's *2084: The End of the World* (French); and Qiu Miaojin's *Notes of a Crocodile* (Chinese). Each of these writers presents a complex and disorienting vision of the world, a vision that is perhaps closer to our own than we care to examine.

---

## Tales of Monsters and Monstrosity



### Overview

This course examines the division between monsters and humans — a division that is sometimes clear and sometimes nebulous. What makes someone (or something) monstrous? What separates monsters from humanity? Drawing on texts that feature such monsters as werewolves, witches, vampires, corrigible criminals, and untamed women, we move from ancient Greece to the present day in order to examine how perceptions of monstrosity change or remain constant. The class will consider how elements such as race, politics, gender, and disabilities have been used to define monstrosity, and how monsters embody and reflect the fears of their particular societies. Texts will be paired with a study of visual representations of monsters in manuscript and film.

### Goals

The course covers a variety of texts and critical theories from the fourth to twenty-first centuries in order to examine the long history of monsters in literature. A parallel endeavor will be to teach students to engage with and respond to critical theory as they experiment with different critical interpretations. Through writing and discussion, students will consider enduring questions and understandings such as:

- How do we define and classify monsters?
- How do monsters reflect the fears, anxieties, and desires of their societies?
- How and why does a monster's significance shift across time?
- How do monsters reflect various identities and cultures?
- How can literary theory help us interpret texts?

### Homework & Assessment

Students will have reading and/or writing homework to prepare for most class meetings. Major written assessments will include:

- 1 or 2 short close readings of a selected shared text
- 1 annotated bibliography and research proposal
- 1 analytical essay that tracks the historical evolution of a monster
- 1 creative project that envisions the next generation of a monster

### Materials

- *The Bloody Chamber*, Angela Carter
- *The Language of Thorns: Midnight Tales and Dangerous Magic*, Leigh Bardugo
- *The Dew Breaker*, Edwidge Danticat
- *Strange Case of Dr. Jekyll and Mr. Hyde*, Robert Louis Stevenson
- Other short texts and images, to be distributed in class



## Foundations of Science: Chemistry



### Overview & Goals

Nueva's ninth-grade science provides a unified introduction to the principles that describe the natural world at its most fundamental level. The course aims to improve students' understanding of the world around us, and make their thinking more rigorous, by introducing principles of chemistry and applying those concepts in hands-on ways to real-world examples. We also aim for students to develop a robust set of scientific practices: methods for asking questions, designing and carrying out experiments, interpreting the results, and communicating their conclusions to others.

Topics studied this year include:

- gas properties
- atomic nature of matter
- bonding in materials
- chemical reactions
- stoichiometry
- acids and bases
- oxidation-reduction reactions

### Materials

Rather than assigning a single text, we draw on readings, videos, and activities from a variety of sources. And while we do not rely on a common text, we have several textbooks that students are welcome to borrow over short periods and are happy to provide further suggestions for supplementary materials. The course Canvas and Google sites will contain readings and digital copies of documents that are handed out in class. We encourage students to discover additional resources and share them with both us and their peers.

### Weekly Class Structure — What to Bring

Foundations of Science meets as often as three times a week. Wherever practical, students explore the core concepts experientially and experimentally. Much of the course is built around a series of "missions" in which students work in groups during one to several class sessions to solve a problem requiring the integration of content understanding and laboratory technique.

Students should bring to class:

- a laptop (used for data collection, research, and simulations), and/or
- a notebook and a pen or pencil
- *optional:* a three-ring binder with paper for notes and tabs to help organize; this may be shared with other subjects as long as the organization scheme effectively differentiates
- their curiosity, enthusiasm, and sense of humor

### Homework

Students should spend an average of about 90 minutes or less on homework per week. In general, assignments might consist of doing a short reading to review and/or formalize learning from class, watching an explanatory video, or finishing a worksheet or write-up from class. Extension problem sets and activities can be made available for those who seek more challenge and/or depth; if they are insufficient, students should ask for more. Students also sometimes find concepts and quantitative problems in chemistry to be challenging; indeed, we hope that each will feel challenged in this course. It is our hope and intent that, when confronted with a challenge, students will feel motivated to review the materials provided to them closely, meet with their teachers outside of class, and discuss problem-solving approaches (but not specific answers) with their peers.



# Core Curriculum

In this course, parents should not assist their children with homework as this prevents students from building intellectual independence and interferes with our ability to assess, support, and plan their learning. If a student appears to be going down a path of feeling lesser-than, or talks about being “not good at science,” *please do let us know* and encourage the student to seek our advice. Most of all, if students appear to be struggling, please encourage them to email or talk with one of the instructors.

## Assessment & Evaluation

Students may be asked to submit lab write-ups or reflections as well as quizzes or in-class problem sets. We also observe student practices and problem-solving approaches during class. Students will also work on a substantial project in the January/February/March timeframe to build their individual scientific skills and apply their understanding to an area of personal interest. Students will present these projects at the Nueva STEM fair. Again, we ask that parents provide moral support while refraining from offering academic assistance.

No grades of any kind will be assigned in the fall semester in alignment with school-wide policies for ninth grade. This is meant as a time of intellectual risk-taking, passion-driven learning, and cognitive growth. Students will be evaluated at the end of the spring semester with a standards-based grading protocol. While they will receive letter grades for specific learning objectives (content understanding, scientific skills, and learning habits), they will not receive an overall course grade, nor will any of this grading appear on their external academic record.

---

## Introduction to Experimental Bioorganic Chemistry



### Overview & Goals

The objective of this course is to discover organic chemistry, the chemistry of carbon, experimentally. Organic molecules such as petrochemicals, natural products, biomolecules, and pharmaceuticals are an integral part of our daily lives. Selected experiments will present common laboratory practices and techniques of organic chemistry, such as chromatography and distillation, and illustrate the chemistry of a wide range of functional groups. Other experiments will allow students to synthesize specific compounds — some of which are found in nature or are of commercial importance — or to explore reactions that are fundamental to organic synthesis: nucleophilic substitution, nucleophilic addition, electrophilic addition, esterification, and oxidation. Additional experiments will emphasize discovery-based approaches, which allow students to develop their own protocols for addressing a particular question experimentally, as they might do in a research laboratory.

The course in general aims for students to develop a robust set of scientific practices in conjunction with content knowledge: methods for asking questions, designing and carrying out experiments, interpreting results, communicating their results to others, and practicing analytical and reasoning skills based on observations.

Topics to be covered during the year include:

- chemical bonding and molecular structure
- hydrocarbons
- kinetics and energy of a reaction
- stereochemistry
- functional groups in organic chemistry
- reaction mechanisms
- chemistry of proteins and enzymes
- independent project



# Core Curriculum

## Resources

Rather than assign a single textbook, I will be excerpting from a variety of sources. The class website will direct students to some of the many (free) resources available on the Internet. I will also provide slide decks available after each class, recapping content viewed that day.

## Weekly Class Structure — What to Bring

Experimental Bioorganic Chemistry meets up to three times a week. Wherever practical, I seek to have students experimentally and sometimes quantitatively explore the core concepts. This will take the form of labs, demonstrations, and/or modeling (using a variety of software).

Students should bring to class:

- a laptop (mostly for researching specific topics, writing lab reports, graphing data, drawing 3-D structures)
- a thick notebook for notes, problem practices, brainstorming, planning, reflections
- a couple of pens
- curiosity, enthusiasm, analytical and reasoning skills

## Homework

I will give students homework that may last up to 90 minutes once a week. The assignments might consist of analyzing data collected during a lab session, watching an explanatory video, tackling numerical or descriptive problems, reading content, researching a topic or writing up the results of a laboratory activity. Students may sometimes find organic chemistry to be challenging. It is my hope and intent that, when confronted with a challenge, students will feel motivated to review the materials provided to them closely, meet with me outside of class, and discuss problem-solving approaches (but not specific answers) with their peers.

## Assessment

Students will be asked to:

- submit homework
- submit selected lab write-ups
- orally present content
- demonstrate problem-solving skills with quizzes/exit tickets or longer tests (one per unit)
- reflect

Students will be asked at times to conduct an experiment in class in lieu of a test. I will also observe student practices and problem-solving approaches during class, which will allow me to provide informal feedback.

---

## Chemical Engineering



### Overview

Chemical engineers operate at the intersection of chemistry, physics, biology, and engineering to solve a range of practical real-life problems — from the large-scale production of pharmaceuticals to the development of novel renewable energies or the design of new biomaterials, to name just a few. This course will cover:

- stoichiometry
- bonding
- crystal field theory
- reaction kinetics
- energy and thermodynamics



# Core Curriculum

- redox reactions

Students will investigate key aspects of chemical engineering through mini-projects. These will require them to integrate an understanding of chemical theory with best scientific practices, including small-scale experimentation, data/process analysis, and iteration. Students will have multiple opportunities to gather qualitative or quantitative data, understand and accurately represent data when needed, and use data to evaluate predictions, support structure determination, and propose plans of action. Some projects will be performed in groups while others will be individual. The students will spend most of the latter half of the spring semester carrying out group research projects on a chemical engineering topic of their choice.

## In Class

This course will typically meet three times a week. Most classes will be laboratory time dedicated to the projects. There will also be some lectures, discussions, demonstrations, and structured learning activities. Students will periodically present their work to others for discussion, feedback, and peer review. Students should always bring to class:

- a laptop (for researching specific topics, writing reports, plotting data, etc.)
- a dedicated notebook (for note-taking, problem sets, brainstorming, reflections, etc.)
- a few pens and pencils
- curiosity, enthusiasm, analytical, and reasoning skills

## Out of class

Students should expect to dedicate up to 90 minutes a week outside of class to plan laboratory work, analyze data, complete write-ups, and review content. Some out-of-class collaboration will also be required for group missions. Students should even expect to spend some time outside of class doing supervised laboratory work, scheduled on an individual and/or group basis, especially during the group project in the final half of the spring semester. The overall out-of-class workload for this course should be similar to that of other courses. If ChemE seems to be taking over your child's life — in an undesirable way — please encourage them to speak with the instructors. Readings and problem sets will be provided to deepen student understanding and challenge them. Students are also encouraged to meet with the instructors during the tutorial block or a free period for additional individual and/or small-group review.

## **Goals**

The three overarching goals of this full-year course are to:

- provide students with an enduring understanding of foundational theories in physical and inorganic chemistry
- introduce them to the concepts, tools, and problems that chemical engineers grapple with on an everyday basis
- develop their skills for collaborative and independent research

## **Assessment & Evaluation**

We will use formative and summative assessment methods to track students' progress over each semester and provide both written and oral feedback. In class, we will regularly assess students' content understanding, skill development, and laboratory habits, including safety, collaboration, and clean-up. The individual grading rubrics that we will use on Canvas for most assignments and assessments will correspond to specific learning objectives from the course template. In-class quizzes will be given at the end of each unit, and students will be assessed on their overall mastery of content at the end of each semester with a cumulative final. Students will be given the option to reassess once within a week of receiving feedback on their assessments; they will be expected to reassess on the entire assessment, and not just on individual questions or topics. Students may be granted the opportunity for oral assessments in lieu of the written ones, and the same reassessment policy will apply.



# Core Curriculum

At the end of the fall semester, students will be evaluated in seven areas, outlined on the course learning objective template. For each area, there are three standards, building in complexity from foundational to exemplary. Project write-ups, assessments, and work in class will be evidence for evaluation of each area. Summative letter grades will be assigned based on the number and level of standards demonstrated.

Students who elect to take external, standardized chemistry evaluations such as the SAT Subject Test in chemistry and the AP chemistry exam are advised to engage in additional preparation. While mastery of the learning objectives of this course will improve student performance on external exams, this course is not designed to be sufficient preparation on its own for exemplary performance on these tests.

## Bringing ChemE Home

The work in ChemE provides an opportunity to engage in conversations about activities at school. In addition to “What did you learn today?”, an inquiring parent might ask what challenge their child attempted to solve or what ideas they have brainstormed for the more open-ended projects. This course will be full of ups and downs as experiments frustratingly do not work as expected — and then succeed! If your child is feeling lost, behind, or self-critical in an unhealthy way, please encourage the student to speak with the instructors.

Because a major objective of the course is for students to gain independence as scientists, we ask that parents refrain from helping students solve specific technical problems related to the projects. Parents are encouraged to be available as a sounding board for problem solving or ideation to the extent their children wish to engage in such dialogue. For example, if a student says, “My reactor did not produce any biodiesel today,” instead of asking to see their calculations and correcting their stoichiometry, it would be helpful to say something like, “That sounds frustrating — what do you think might have happened?” Likewise, should students seek advice on project topics, parents are encouraged to engage in such conversations with questions that facilitate brainstorming without offering specific direction.

---

---

## Drug Design



### Overview

This lab-based introductory medicinal chemistry class emphasizes the application of biological, chemical, and pharmacological concepts in the investigation of drug discovery. Medicinal chemistry has been defined as the “science that deals with the discovery and design of new therapeutic chemicals and their development into useful medicines” (Silverman, 1992). The aim of the class is to introduce students to the basic principles of medicinal chemistry and how they are applied to the design of new therapeutics. The emphasis of this course is that therapeutically relevant small molecules are chemical entities whose biological properties are dependent on chemical structure and physicochemical properties. Therefore, modifications of physicochemical properties are likely to influence the biological behavior of the small molecule. At the end of the course, the student will have a greater awareness of “drug-like” properties in a chemical structure (lipophilicity, H-bonding potential, toxicity potential) and approaches to modify some of the pharmacological properties of compounds. Throughout the class, students will gain confidence in studying a scientific discipline and acquire an appreciation for the field of medicinal chemistry.

Topics to be covered during the year include:

- spectroscopy
- intro to anatomy and physiology



# Core Curriculum

- structure-activity relationship: antibacterials
- structure-activity: cell cycle kinase inhibitors

## Resources

Rather than assign a single textbook, I will be excerpting from a variety of sources. The class website will direct students to some of the many (free) resources available on the Internet. I will also provide slide decks available after each class recapping content viewed that day.

## Weekly Class Structure — What to Bring

Drug design meets up to three times a week. Wherever practical, I seek to have students experimentally and quantitatively explore the core concepts. This will take the form of labs, demonstrations, data analysis, and/or modeling (using a variety of software).

Students should bring to class:

- a laptop (mostly used for researching specific topics, writing lab reports, graphing data, drawing structures in 3-D)
- a thick notebook for notes, problem practices, brainstorming, planning, reflections
- a couple of pens
- curiosity, enthusiasm, analytical and reasoning skills

## Homework

I will give students homework that may last up to 90 minutes once a week. The assignments might consist of analyzing data collected during a lab session, watching an explanatory video, tackling numerical or descriptive problems, reading content, researching a topic, or writing up the results of a laboratory activity. Students may sometimes feel challenged. It is my hope and intent that, when confronted with a challenge, students will feel motivated to review the materials provided to them closely, meet with me outside of class, and discuss problem-solving approaches (but not specific answers) with their peers.

## Assessment

Students will be asked to:

- submit homework
- submit selected lab write-ups
- orally present content
- demonstrate problem-solving skills with longer tests (one per unit)
- demonstrate problem-solving skills with independent projects
- reflect

Students will be asked at times to conduct an experiment in class in lieu of a test. I will also observe student practices and problem-solving approaches during class, which will allow me to provide informal feedback.

---

## Biology



### Overview

Our goal for tenth-grade biology is to develop students' understanding of and appreciation for the living world in all its complexity. The living world exists in a dynamic state of balance that is and will continue to be drastically affected by human activity. Over the course of this year, students will develop their understanding of dynamic



# Core Curriculum

living systems, and how humans can gradually destroy, or, as we all hope, preserve our living world. In addition to giving students the theoretical tools to have a positive impact on the living world, their education in biology will develop their understanding of the process of science through direct experience. Throughout the year, they will perform authentic scientific research and participate in scientific discourse just as any scientist would. We hope that this class will help students find connections between biology and other interests, and inspire new interests in the complexities of our living world.

Topics to be covered during the year include:

- biochemistry and macromolecules
- cell structure and membrane transport
- gene expression and epigenetics
- biotechnology techniques
- inheritance
- evolution
- ecology

## Goals

Students will:

- demonstrate breadth and depth of knowledge in biology
- develop a fluency in the language of the discipline
- apply concepts to novel situations within biology as well as other disciplines
- plan and carry out scientific investigations
- analyze and interpret data
- obtain, evaluate, and communicate information

## Materials

Daily, students should bring to class:

- a laptop (for background research and as a data collection interface)
- a tool students can use as a notebook, whether physical or digital or a hybrid note-taking tool
- a writing utensil

As is typical in a Nueva course, there is no specific textbook that covers all the material from the class. Resources are pieced together from a variety of sources, including textbooks, scientific journal articles, websites, and videos. While it is not required, a recommended textbook for the biological concepts of this course is *Campbell Biology* (11th edition, although older editions are fine). We have a number of copies in the lab that are available for short-term checkout.

Resources (required or optional) are listed in the “Reference Resources” section of the [Daily Plans](#). The resources often include additional readings, videos, or interactive websites that students may find useful.

## Homework

Students should expect to spend an average of about 90 minutes on homework per week. These assignments may include exploring topics in greater depth, working problem sets, analyzing data collected during a lab session, writing up understandings of the labs, reflecting on their learning, etc. It is also essential that students reflect on concepts in class and continue to build understanding through making connections to everyday life.

## Assessment

Students will be evaluated on their understanding of content through regular assessment events in the form of oral in-class assessments, written in-class assessments, and responses to in-class challenge questions. In



# Core Curriculum

alignment with standards-based grading, these assessments will be opportunities to demonstrate an understanding of the subject matter.

## Content

Students will be evaluated on content at least once every two weeks. We want to make sure that students have enough time to study, but we want to make sure that they get frequent feedback; thus the two-week timeline. These frequent evaluations are formative assessments, which give students a chance to check how much content understanding they can demonstrate and thereby give them a chance to adjust their learning to meet their academic goals. Students should expect to retain and build on previous concepts as we move through the semester and year; no content is obsolete or irrelevant.

## Skills

One of the main goals of this course is to instill a sense of excitement and interest in the pursuit of understanding and innovation in the field of biology. Roughly broken into three major categories, skills emphasized in this course develop students' understanding of the iterative and on-going nature of science, key elements of strong experimental design, and the process of making sense of experimental data. Over the course of the fall semester, students will be given multiple opportunities to develop and demonstrate these scientific skills.

Students are evaluated on their skills through regular events in the form of student observations, submitted work, and discussion. As with content, in order to fully demonstrate a particular learning objective, students must demonstrate the skills a specific (n) number of times, which varies depending on the difficulty and task itself.

## **Habits of Learning**

We believe habits of learning are some of the most important learning developments that take place in the class. Habits of learning can be transferable to other fields; successful habits in one field often lead to success elsewhere. With the guidance of the instructor, students will choose two habits: one habit of a scientist and one habit of a learner. The student is responsible for defining the specific habits to focus on in the class, proposing the timing and methods for evaluating themselves on these habits and proposing the grade they receive in this section of the template. The rationale behind this choice is the belief that students develop their metacognition in regards to their habits of learning when they are tasked with tracking their growth and evaluating themselves accordingly.

## **Grading**

Students are graded using standards-based grading as outlined in the [course template](#), as well as on the course Canvas page. Grades are composed of content and skills, each weighted at 45% of the overall grade, and habits, weighted at 10%. Students can use feedback on assignments and Canvas to track their progress in course objectives and infer their performance in the class. Students are encouraged to consult with their teacher if they have questions about their standing in the course.

---

# Physics



## **Goals**

This course aims to improve students' understanding of the world around us, and make their thinking more rigorous, by introducing principles of physical sciences and applying those concepts to real-world examples. We



# Core Curriculum

also aim for students to develop a robust set of scientific practices: methods for asking questions, designing and carrying out experiments, interpreting the results, and communicating their results to others. The course emphasizes important principles such as Newton's laws and includes more specific phenomena as necessary to illuminate those principles. Students explore physics experimentally whenever practical. When a phenomenon is not tractable to classroom demonstration, digital simulations are employed. Students explore new content primarily through teacher-created screencasts and readings, with some Socratic lecture and classroom discussion. Students spend most of their classroom time learning to solve problems, design and perform experiments, and analyze demonstrations of (sometimes unexpected) results.

Topics to be covered during the year include:

- kinematics
- dynamics
- conservation and transformations of energy
- gravity
- oscillations and waves
- sound, light, and optics
- thermodynamics

Much of the year will be devoted to kinematics and dynamics. Although some of the remaining topics overlap with the previous year's ninth-grade science, the full-year format will allow exploration in substantially greater depth.

## Resources

Rather than assign a single textbook, we will be excerpting from a variety of sources as well as producing readings for students. Class web sites also direct students to some of the many (free) resources available on the internet.

## Weekly Class Structure — What to Bring

The class meets in a laboratory or room with lab space available. We seek to have students explore core concepts experimentally/experientially and quantitatively whenever practical. This may take the form of labs, demonstrations, and/or numerical simulations (often constructed by the students using a variety of software).

Students should bring to class:

- their Nueva laptop (used for data collection in lab and for simulations)
- a three-ring binder with paper for notes, and tabs to help organize, or a bound notebook with a dedicated science section
- a pen or pencil
- their curiosity, enthusiasm, and sense of humor

## Homework

We ask students to spend an average of 20–30 minutes on homework per class meeting. Their assignments might consist of analyzing data collected during a lab session, watching an explanatory video, tackling numerical or descriptive problems, or writing up a Statement of Understanding from a laboratory activity. Students sometimes find quantitative problems in the physical sciences to be challenging. It is our hope and intent that, when confronted with a challenge, students will feel motivated to review the materials provided to them closely, meet with us outside of class, and discuss problem-solving approaches (but not specific answers) with their peers. If a student appears to be going down a path of feeling lesser-than, or refers to himself/herself as "not good at science," please let us know!



# Core Curriculum

## Assessment

Students may be asked to submit homework, lab write-ups, reflections, as well as quizzes or longer tests. We also try to observe student practices and problem-solving approaches during class. Students may also tackle more extensive projects as they gain laboratory and investigational skills.

---

## Advanced Mechanics



### Goals

This course represents an in-depth study of mechanics, including the mathematical tools of calculus and elements of mechanical engineering. Unlike the treatment in first-year physics, where objects are usually approximated as point masses or having infinite stiffness, here we may consider an object's center of mass, rotational inertia, modulus of elasticity, or other properties. Students solve problems of substantially greater complexity than those encountered in earlier classes. We also aim for students to develop a robust set of scientific practices: methods for asking questions, designing and carrying out experiments, interpreting the results, and communicating their results to others. Students explore physics experimentally whenever practical. When a phenomenon is not tractable to classroom demonstration, digital simulations are employed. Students spend most of their classroom time learning to solve problems, design and perform experiments, and analyze demonstrations of (sometimes unexpected) results.

Topics to be covered during the year include:

- kinematics
- dynamics
- center of mass, impulse, and momentum
- conservation and transformations of energy
- gravity
- rotation and rolling
- oscillations and waves

### Resources

Rather than assign a single textbook, we will be excerpting from a variety of sources as well as producing readings for our students.

### Weekly Class Structure — What to Bring

We seek to have students explore core concepts experimentally/experientially and quantitatively whenever practical. This may take the form of labs, demonstrations, and/or numerical simulations. We also emphasize deriving mathematical models to bolster our students' conceptual understanding of physics.

Students should bring to class:

- their Nueva laptop (used for data collection in lab and for simulations)
- a three-ring binder with paper for notes and tabs to help organize, or a bound notebook with a dedicated science section
- their curiosity and enthusiasm



# Core Curriculum

## Homework

We ask students to spend an average of 90 minutes per week on homework. Their assignments may consist of analyzing data collected during a lab session, watching an explanatory video, tackling numerical or descriptive problems, or writing up a lab report. We often will encourage collaboration on assignments. Students sometimes find quantitative problems in the physical sciences to be challenging. It is our hope and intent that, when confronted with a challenge, students will attempt the problem on their own, and then meet with us outside of class or discuss problem-solving approaches with their peers. If a student appears to be going down a path of feeling lesser-than, or refers to themselves as “not good at science,” please let us know!

## Assessment

Students may be asked to submit homework, lab write-ups, reflections, as well as quizzes or longer tests. We also try to observe student practices and problem-solving approaches during class. Students will also tackle more extensive independent projects as they gain laboratory and investigational skills.

---

## Modern Physics



### Goals

This course builds on the first-year introduction to physics and generally covers developments from the late 19th century through the present day. Transitioning from the relatively intuitive principles of classical physics, students explore the more conceptually profound and challenging ideas demanded by 20th and 21st century science. Students will study phenomena experimentally whenever practical. When a phenomenon is not tractable to classroom demonstration, digital simulations are employed. Students explore new content primarily through teacher-created screencasts and readings, with some Socratic lecture and classroom discussion. Students spend most of their classroom time learning to solve problems, design and perform experiments, and analyze demonstrations of (sometimes unexpected) results.

Topics to be covered during the year include:

- electromagnetism
- relativity
- nuclear physics
- quantum physics
- standard model of particle physics

### Resources

We will be excerpting from a variety of sources, but are likely to rely on a textbook for our exploration of quantum phenomena. Class web sites also direct students to some of the many (free) resources available on the internet.

### Weekly Class Structure — What to Bring

The class meets two or three times a week, always in a laboratory or with lab space available. We seek to have students explore core concepts experimentally/experientially and quantitatively whenever practical. This may take the form of labs, demonstrations, and/or numerical simulations (often constructed by the students using a variety of software).

Students should bring to class:

- their Nueva laptop (used for data collection in lab and for simulations)



# Core Curriculum

- a three-ring binder with paper for notes, and tabs to help organize, or a bound notebook with a dedicated science section
- a dedicated lab notebook
- a pen or pencil
- their curiosity, enthusiasm, and sense of humor

## Homework

We ask students to spend an average of 20–30 minutes on homework per class meeting. Their assignments might consist of analyzing data collected during a lab session, watching an explanatory video, tackling numerical or descriptive problems, or writing up a Statement of Understanding from a laboratory activity. Students sometimes find quantitative problems in the physical sciences to be challenging. It is our hope and intent that, when confronted with a challenge, students will feel motivated to review the materials provided to them closely, meet with us outside of class, and discuss problem-solving approaches (but not specific answers) with their peers. If a student appears to be going down a path of feeling lesser-than, or refers to himself/herself as “not good at science,” please let us know!

## Assessment

Students may be asked to submit homework, lab write-ups, reflections, as well as quizzes or longer tests. We also try to observe student practices and problem-solving approaches during class. Students may also tackle more extensive projects as they gain laboratory and investigational skills.

---

## Environmental Earth Science



### Overview

Environmental Earth Science is a rigorous examination of the interaction between natural and human systems. The emphasis of the fall semester is on developing students' understanding of major natural systems — geosphere, atmosphere, etc. — building on their foundation in chemistry, physics, biology, and mathematics, while the spring focuses on the web of connections with human civilization. The course prioritizes developing students' capacity to analyze a variety of pieces of evidence, from physical specimens and field sites to maps and data sets. The overarching goal is for students to develop the scientific understanding and tools necessary to address problems of human impact and sustainability.

### Goals

This full-year course aims to:

- build an applied understanding of major subsystems of the Earth System and their interactions with each other
- build an enduring understanding of the interactions between the Earth System and human civilization, with an emphasis on how each system affects the other
- strengthen core scientific skills in observation, questioning, application of theory, experimental design, and data analysis
- motivate students to leverage their full skill set (science, humanities, etc.) to design and advocate for a better future



# Core Curriculum

## Learning Activities

Class will be a mixture of problem-solving, discussion, presentations, research analysis, lab work, artifact investigation, field work, and independent learning. Activities will be differentiated in recognition of the substantial diversity of backgrounds and interests students bring to this course.

Students should expect to spend some time outside of class reading, writing, doing research, collaborating on long-term projects, studying concepts, preparing presentations, and going outside. If your child seems to be spending an inordinate amount of time on EES homework, or talks about their work like it is a chore, please encourage your child to speak with the instructors; it is possible that the nature of the assignments has been misunderstood or the rationale ineffectively communicated.

## Field trips

There will be at least one required field trip in the fall semester, and potentially additional trips (which may be optional) in the spring semester.

## Assessment & Evaluation

### Deliverables

Students will be assessed through a variety of modes: in-class assessments (often hands-on), written reports, presentations, collaborative and individual projects, discussion, reflections, and field work.

### Grading

At the end of each semester, students will be evaluated in several areas, outlined on the course learning objective template. For each area, there are three standards, building in complexity from Foundational to Exemplary. Both formal assignments and in-class activities will be evidence for evaluation of each area. Summative letter grades will be assigned based on the standards demonstrated.

### External Evaluations

Students who elect to take external, standardized evaluations such as the AP Environmental Science exam are advised to engage in additional preparation. While mastery of the learning objectives of this course will improve student performance on external exams, this course is not designed to be sufficient preparation on its own for exemplary performance on these tests.

### Bringing EES Home

The content of this course has relevance to a great many topics of everyday importance — traffic, phone charging, hills, sunsets, food at the table. Parents and guardians can always engage students in conversations like “What did you learn today in EES?” or ask how what they have learned in the course so far gives them insight about anything lying in the current field of view. Current events often have direct or relevant environmental causes and effects and this might also be a way to engage EES students in broader conversations.

Parents, guardians, and/or tutors should not assist EES students with the completion of their work for the course. Parents and guardians should feel empowered to offer their services as a sounding board for their children if they can do so in a neutral manner, helping their child explore their own thoughts and ideas without offering direction or judgment. Students who describe struggling with the content or structure of EES should be encouraged to speak with the instructors, who are committed to every student thriving in this course.



## Mathematics at Nueva



We recognize and firmly believe that mathematics and analytical thinking play an enormously important role in our world. Therefore, above all, we hope curiosity inspires our students to creatively seek out mathematical solutions to the myriad problems they face in all aspects of their lives, and that they find joy in playing with mathematical ideas. We expect our students to have the mathematical literacy to be able to see and explain the world around them through mathematics and to be able to consume information critically and produce rigorous results. We push our students to understand mathematics both in abstraction and in application, hoping to instill wonder and relevancy as students pursue real-world problem-solving strategies as well as deep competence in conceptual mathematics. It is our hope that, when faced with all types of problems and choices, Nueva students have the habits of mind to think through these mathematically. Once problems have been analyzed and understood, we firmly believe that mathematicians must be able to communicate their results with others and be able to extrapolate their results to new situations. Therefore, a heavy emphasis will be placed on reflection, communication of findings, application to other domains, collaboration with others, and the ability to justify and analyze thinking.

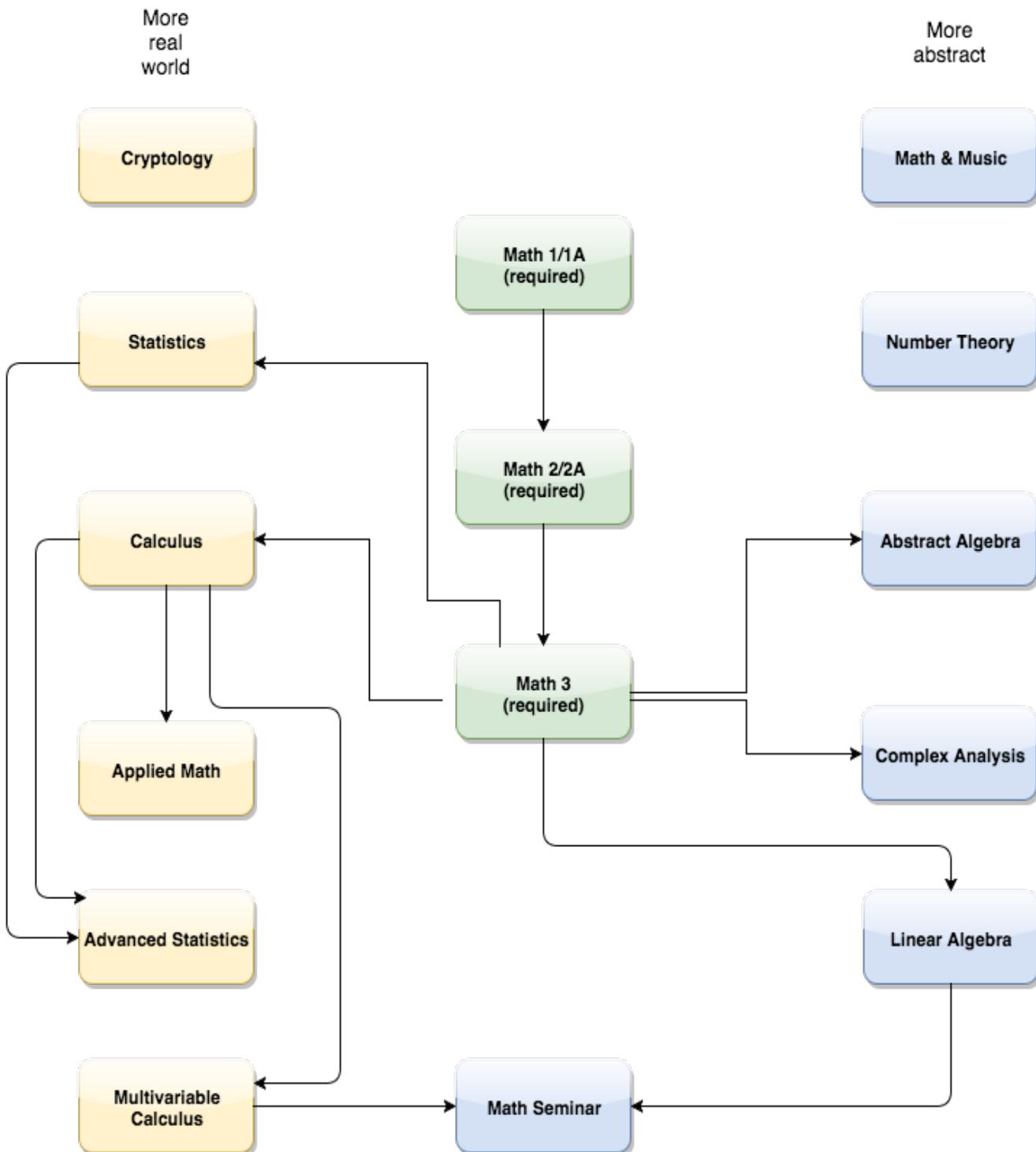
We see information technology as an excellent medium for enriching student understanding and making the learning process broader and more tangible. Technology is embraced in modeling, investigation, abstraction, and prediction. All students are expected to bring their study of programming to bear on analyzing and modeling problems; students will generalize solutions on Excel, learning the commands for data analysis; they will use graphing calculators and online tools such as Desmos to tackle more complicated problems; and, in the Innovation Lab, students will be expected to bring math to life through models, art, and 3-D technology. Through these many modalities, students will uncover the multiple layering of mathematics and its applications. Technology will be used to enhance student understanding, never to replace it.

This three-year integrated sequence looks deeply at mathematical reasoning as a framework for discovery, exploration, and understanding. The courses build students' competence in mathematical reasoning: asking probing questions, generalizing patterns, building strong arguments, finding multiple approaches to solving problems, reflecting on the problem-solving process, and communicating clear results. Students will explore mathematics as a cycle: we take problems (sometimes from the real world), abstract them, perform mathematical processes, and then apply and communicate our understanding. Students will also explore mathematical programming as a means of harnessing the power and function of computational thinking. Each course spirals through the threads of number systems, probability and statistics, geometry, and functions, going deeper and integrating these content domains to help students develop a variety of tools, representations, and ways of thinking mathematically.

In addition to the teachers listed in the courses below, there are 4 associate teachers available to support students in any of the courses in mathematics.



## Flow of Math Courses



Green represents core curriculum, blue and yellow are electives, and arrows represent prerequisites.



## Math 1



### Overview

This course builds students' competence in mathematical reasoning, focusing on generalizing patterns, building strong arguments, and finding multiple approaches to solving problems. Students will learn to ask probing questions, reflect on their problem-solving process, and clearly communicate their findings. Students will develop mathematical fluency by integrating geometry and algebra with rich introductions to sets, logic and abstract algebra, quadratic and transcendental functions, congruence and similarity of triangles, formal proof and notation, descriptive statistics and vectors, . The underlying focus for the year is on building the language and foundations of mathematics.

### Goals

- Generalize trends from patterns so as to ask questions, form hypotheses, test special cases, and prove observed trends
- Cultivate the metacognition to self-identify one's understanding/processing in order to recognize misunderstanding
- Construct sound proofs; evaluate the soundness of proofs; spot logical flaws in proofs and address them
- Instinctively bring a mathematical framework to problems; demonstrate the skills to abstract problems into the mathematical space and the skills to apply the result back to the real world
- Use functions as a formal means of abstracting and capturing real-world phenomena in mathematical terms
- Work from an understanding that many problems have multiple approaches so as to motivate finding creative and elegant solutions to problems and looking for connections
- Use the design thinking process to break complex problems into smaller pieces and pursue promising leads and test cases, iterating to uncover underlying patterns
- Use technology to explore, extrapolate, and calculate with greater precision
- Clearly state mathematical arguments and communicate mathematical results, identifying the core ideas of an argument and analyzing others' thinking and argumentation
- Be able to work productively both independently and with others; collaborate effectively, communicating one's thoughts and learning from and supporting others' efforts
- Make personal connections to mathematics, develop curiosity and self-agency as users and creators of mathematics, develop appreciation for beauty and elegance in mathematical thinking, and seek out challenges and persevere through them

### Materials

Students are expected to come to class prepared. They should have the following every day:

- Computer (with Mathematica and Geometer's Sketchpad installed)
- Composition notebook with graph paper
- Pen, pencil, and eraser
- Protractor, compass, and ruler
- Something with which to take a picture and record a video (your computer can do this)
- nSpire calculator (for students intending to take standardized tests this year)
- Open and creative mind
- Textbook: Haese *Mathematics (Middle School 1B)*, in digital form



# Core Curriculum

## Homework

Homework is an integral part of the learning experience for our students. We see homework as a time for students to reflect on what they have learned, make connections and new discoveries, and preview upcoming topics. Homework should be interesting and it should feel relevant. We expect students to engage deeply in the assignments. Therefore, we ask our students to commit to forty five minutes per eighty minute class of undivided attention. Many assignments will provide additional problems and opportunities for students to dig deeply. If a student chooses to work more than forty five minutes because the work is invigorating, we encourage this provided it is done in a healthy and responsible manner. We expect homework to be completed with effort and on time in order to be as useful as possible for student learning. Students are encouraged to regularly review previous assignments and look for connections and opportunities to spiral deeper and transfer knowledge to a different domain. In addition to regular homework assignments, there will also be opportunities for students to engage in longer-term investigations and projects several times in a semester.

## Assessment

It should be stated that we expect our students to develop mastery in the topics we cover. We also fully intend to provide opportunities for students to dig deeply into their own passions and interests. Our students, therefore, will have multiple opportunities to display mastery of material. Assessments will include, but are not limited to:

- created videos
- oral tests
- written summaries and reflections
- examples of exemplary work collected in a portfolio
- application problems
- labs and investigations done alone or with other students
- computer programs
- formal quizzes and tests

The assessments are geared to improve the way in which students learn as much as they are an opportunity to give feedback on how to improve one's current understanding. We strongly believe in growth mindset and will provide opportunities for students to iterate previous assessments to demonstrate progress. Homework assignments will generally be used as opportunities for learning and feedback, but can sometimes be used as secondary evidence of content mastery.

## Grading

Students in grades 10, 11, and 12 receive an overall course grade that demonstrates knowledge of course content, mathematical practices, and habits of learning. The overall grade comprises 45% content, 35% practices, and 20% habits of learning. Students are given specific standards-based feedback regularly on their progress and encouraged to learn from, revise, and reassess in order to demonstrate progress over time.

## Individual Assistance

Students should find assistance from their peers, from their teacher, and from other teachers. It is our belief that there is merit in having the grit and tenacity to work through problems on one's own at times. However, it is also our belief that working through problems with others (peers and teachers) is always a rich experience. We urge students to come talk to us about concerns, interests, or anything else that seems relevant. All upper school teachers have desks at school and will make every effort to be available to students. Please talk to your individual teacher to arrange help outside of class. Nueva math teachers and associate teachers are available before and after school, during lunch and tutorial, and during blocks throughout the day. Students can make an appointment to come in as needed.



## Math 2



### Overview

This course builds on the content and skills developed in Math 1, including an introduction and refinement of combinatorics and probability, polynomials, applications of trigonometry, and model building, further work with number systems, functions, and geometric concepts related to circles and polygons, with an emphasis on connections between all of these strands. Students will work individually and in groups to derive, make sense of, and apply what they are learning to solve compelling problems, while continuing to develop their ability to reflect on and communicate their thinking effectively. Modeling and applying mathematics to the real world via connections to other disciplines will serve as a consistent thread throughout the course.

### Goals

- Generalize trends from patterns so as to ask questions, form hypotheses, test special cases, and prove observed trends
- Cultivate the metacognition to self-identify one's understanding/processing in order to recognize misunderstanding
- Construct sound proofs; evaluate the soundness of proofs; spot logical flaws in proofs and address them
- Instinctively bring a mathematical framework to problems; demonstrate the skills to abstract problems into the mathematical space and the skills to apply the result back to the real world
- Use functions as a formal means of abstracting and capturing real-world events in mathematical terms
- Work from an understanding that many problems have multiple approaches so as to motivate finding creative and elegant solutions to problems and looking for connections
- Use the design thinking process to break complex problems into smaller pieces and pursue promising leads and test cases, iterating to uncover underlying patterns
- Use technology to explore, extrapolate, and calculate with greater precision
- Clearly state mathematical arguments and communicate mathematical results, identifying the core ideas of an argument and analyzing others' thinking and argumentation
- Be able to work productively both independently and with others; collaborate effectively, communicating one's thoughts and learning from and supporting others' efforts
- Make personal connections to mathematics, develop curiosity and self-agency as users and creators of mathematics, develop appreciation for beauty and elegance in mathematical thinking, and seek out challenges and persevere through them

### Materials

Students are expected to come to class prepared. They should have the following every day:

- computer
- composition notebook with graph paper
- pen, pencil, and eraser
- protractor, compass, and ruler
- something with which to take a picture and record a video (your computer can do this)
- nSpire calculator
- open and creative mind
- textbook: Mathematics HL Core 3rd Edition

In addition, we will use the online textbook *Understandable Statistics, Concepts and Methods*



# Core Curriculum

## Homework

Homework is an integral part of the learning experience for our students. We see homework as a time for students to reflect on what they have learned, make connections and new discoveries, and preview upcoming topics. Homework should be interesting and it should feel relevant. We expect students to engage deeply in the assignments. Therefore, we ask our students to commit to forty-five minutes per eighty minute class of undivided attention. Many assignments will provide additional problems and opportunities for students to dig deeply. If a student chooses to work more than forty-five minutes because the work is invigorating, we encourage this provided it is done in a healthy and responsible manner. We expect homework to be completed with effort and on time in order to be as useful as possible for student learning. Students are encouraged to regularly review previous assignments and look for connections and opportunities to spiral deeper and transfer knowledge to a different domain. In addition to regular homework assignments, there will also be opportunities for students to engage in longer-term investigations and projects several times in a semester.

## Assessment

It should be stated that we expect our students to develop mastery in the topics we cover. We also fully intend to provide opportunities for students to dig deeply into their own passions and interests. Our students, therefore, will have multiple types of opportunities to display mastery of material. Assessments will include, but are not limited to:

- created videos
- oral tests
- written summaries and reflections
- examples of exemplary work collected in a portfolio
- application problems
- labs and investigations done alone or with other students
- computer programs
- formal quizzes and tests

The assessments are geared to improve the way in which students learn as much as they are an opportunity to give feedback on how to improve one's current understanding. We strongly believe in growth mindset and will provide opportunities for students to iterate previous assessments to demonstrate progress. Homework assignments will generally be used as opportunities for learning and feedback, but can sometimes be used as secondary evidence of content mastery.

## Grading

Students in grades 10, 11, and 12 receive an overall course grade that demonstrates knowledge of course content, mathematical practices, and habits of learning. The overall grade comprises 45% content, 35% practices, and 20% habits of learning. Students are given specific standards-based feedback regularly on their progress and encouraged to learn from, revise, and reassess in order to demonstrate progress over time.

## Individual Assistance

Students should find assistance from their peers, from their teacher, and from other teachers. It is our belief that there is merit in having the grit and tenacity to work through problems on one's own at times. However, it is also our belief that working through problems with others (peers and teachers) is always a rich experience. We urge students to come talk to us about concerns, interests, or anything else that seems relevant. All upper school teachers have desks at school and will make every effort to be available to students. Please talk to your individual teacher to arrange help outside of class. Nueva math teachers and associate teachers are available before and after school, during lunch and tutorial, and during blocks throughout the day. Students can make an appointment to come in as needed.



## Math 3



### Overview

Students will spiral deeper into the content developed in Math 1 and Math 2 and prepare for advanced studies in calculus, statistics, number theory, abstract algebra, and other math electives, as well as physics, game theory, economics, and other science/social science electives through thought-provoking problems and projects. As topics from previous courses are deepened, Math 3 content will include statistical hypotheses, functions and their graphs, trigonometric proofs and identities, and various topics in geometry, including vectors, circles and conics, as well as introduce topics in calculus. Math 3 serves as a culminating course for Nueva's integrated Math curriculum, helping students see mathematics as a cohesive and beautiful system.

### Goals

- Generalize trends from patterns so as to ask questions, form hypotheses, test special cases, and prove observed trends
- Cultivate the metacognition to self-identify one's understanding/processing in order to recognize misunderstanding
- Construct sound proofs; evaluate the soundness of proofs; spot logical flaws in proofs and address them
- Instinctively bring a mathematical framework to problems; demonstrate the skills to abstract problems into the mathematical space and the skills to apply the result back to the real world
- Use functions as a formal means to abstract and capture real-world phenomena in mathematical terms
- Work from an understanding that many problems have multiple approaches so as to motivate finding creative and elegant solutions to problems and looking for connections
- Use the design thinking process to break complex problems into smaller pieces and pursue promising leads and test cases, iterating to uncover underlying patterns
- Use technology to explore, extrapolate, and calculate with greater precision
- Clearly state mathematical arguments and communicate mathematical results, identifying the core ideas of an argument and analyzing others' thinking and argumentation
- Be able to work productively both independently and with others; collaborate effectively, communicating one's thoughts and learning from and supporting others' efforts
- Make personal connections to mathematics, develop curiosity and self-agency as users and creators of mathematics, develop appreciation for beauty and elegance in mathematical thinking, and seek out challenges and persevere through them

### Materials

Students are expected to come to class prepared. We recommend the following:

- computer
- composition notebook with graph paper
- pen, pencil, and eraser
- nSpire calculator
- open and creative mind
- textbook: *Mathematics HL Core 3rd Edition*, in digital form

### Homework

Homework is an integral part of the learning experience for our students. We see homework as a time for students to reflect on what they have learned, make connections and new discoveries, and preview upcoming



# Core Curriculum

topics. Homework should be interesting and it should feel relevant. We expect students to engage deeply in the assignments. Therefore, we ask our students to commit to forty five minutes per eighty minute class of undivided attention. Many assignments will provide additional problems and opportunities for students to dig deeply. If a student chooses to work more than forty five minutes because the work is invigorating, we encourage this provided it is done in a healthy and responsible manner. We expect homework to be completed with effort and on time in order to be as useful as possible for student learning. Students are encouraged to regularly review previous assignments and look for connections and opportunities to spiral deeper and transfer knowledge to a different domain. In addition to regular homework assignments, there will also be opportunities for students to engage in longer-term investigations and projects several times in a semester.

## Assessment

It should be stated that we expect our students to develop mastery in the topics we cover. We also fully intend to provide opportunities for students to dig deeply into their own passions and interests. Our students, therefore, will have multiple types of opportunities to display mastery of material. Assessments will include, but are not limited to:

- created videos
- oral tests
- written summaries and reflections
- examples of exemplary work collected in a portfolio
- application problems
- labs and investigations done alone or with other students
- computer programs
- formal quizzes and tests

The assessments are geared to improve the way in which students learn as much as they are an opportunity to give feedback on how to improve one's current understanding. We strongly believe in growth mindset and will provide opportunities for students to iterate previous assessments to demonstrate progress. Homework assignments will generally be used as opportunities for learning and feedback, but can sometimes be used as secondary evidence of content mastery.

## Grading

Students in grades 10, 11, and 12 receive an overall course grade that demonstrates knowledge of course content, mathematical practices, and habits of learning. The overall grade comprises 45% content, 35% practices, and 20% habits of learning. Students are given specific standards-based feedback regularly on their progress and encouraged to learn from, revise, and reassess in order to demonstrate progress over time.

## Individual Assistance

Students should find assistance from their peers, from their teacher, and from other teachers. It is our belief that there is merit in having the grit and tenacity to work through problems on one's own at times. However, it is also our belief that working through problems with others (peers and teachers) is always a rich experience. We urge students to come talk to us about concerns, interests, or anything else that seems relevant. All upper school teachers have desks at school and will make every effort to be available to students. Please talk to your individual teacher to arrange help outside of class. Nueva math teachers and associate teachers are available before and after school, during lunch and tutorial, and during blocks throughout the day. Students can make an appointment to come in as needed.



## Statistics and Probability



### Overview

How do we become critical consumers of data? How do we use data effectively to create an argument that is statistically significant? What must we be cautious of when designing an experiment? This course in statistics first explores how to interpret categorical and quantitative data, including both 1- and 2-variate, and then explores different tests that allow us to make inferences and justify conclusions.

In the second semester, we will more deeply explore chance behavior, including independence and conditional probability, as well as how expected value allows us to evaluate outcomes of decisions. From politics to science, social justice to business, understanding statistics and probability gives students the tools to manipulate and make sense of the data all around us.

### Goals

- Produce convincing oral and written statistical arguments, using appropriate terminology, in a variety of applied settings.
- Know when and how to use technology to aid in solving statistical problems.
- Become critical consumers of published statistical results by heightening your awareness of ways in which statistics can be improperly used to mislead, confuse, or distort the truth.
- Know and utilize essential techniques for producing data (surveys, experiments, observational studies), analyzing data (graphical and numerical summaries), modeling data (probability, random variables, sampling distributions), and drawing conclusions from data (inference procedures).

### Homework

Homework serves a variety of purposes, such as practicing skills, reflecting on newly learned concepts, extending ideas from class work, introducing or previewing new concepts, and working on long-term assignments and projects. Homework is an opportunity to explore ideas and take risks, and perfection is not expected. You will generally have about 30–45 minutes of homework each day you have class. If you find yourself spending significantly more time, you are encouraged to discuss the matter with your teacher. Some longer assignments will take longer (maybe much longer!) than 30 minutes, but they will typically not be due the next day.

### Assessment

You will be assessed in a number of different ways, including individual paper/pencil quizzes, oral assessments, projects, presentations, and classwork. You also will have numerous problem sets and free response questions in which we expect you to maintain absolute academic integrity.

### Materials

You will need dedicated space for notes which you will bring with you to class every day, and a folder for handouts and homework. You will also need writing utensils. This class will utilize a graphing calculator as well as the software available on your laptops to complete assignments.



## Advanced Statistics A & B



### Overview

Advanced Statistics is a calculus-based course to teach students the mathematical underpinnings of the most frequently used statistical methods and their applications to data analysis. The course begins with an introduction into sampling spaces and the algebra of sets, combinatorics, and probability theory, including derivations of properties of random variables and probability density functions. Specific topics covered include derivations of the properties of binomial distributions, the normal distribution, and proof of the Central Limit Theorem; estimation methods for parameters, biased and unbiased estimates, and their associated distributions; distributions of the variance; Chebyshev's Inequality; mathematical understanding of methods of hypothesis testing, meaning of confidence intervals, and reasons for choices of distributions (T-test, F-Test, chi-square test) and the mathematical assumptions behind the distributions; derivation of linear regression and the correlation coefficient; and derivation of the T-test and chi-square test beginning from the gamma distribution (a form of the Laplace transform). Applications and projects will be used throughout the course to teach methods for using the theorems and formulas that are derived in the course. A unit will also cover topics of statistical sampling, inference, and fallacies of statistics in everyday use. This course is a fairly rigorous applied math course and students should feel comfortable with calculus and be prepared to quickly acquire and integrate understanding of techniques from multiple areas such as multivariable calculus, linear algebra, and probability theory.

### Goals

- Learn about statistical reasoning and understand the assumptions underlying statistical approaches
- Learn about the pitfalls of using statistics to draw inferences — in particular, causality versus correlation
- Strengthen mathematical rigor with regard to working with data
- Develop an understanding of many statistical methods that are used in science and engineering, and what their capabilities and limitations are
- Develop mathematical tools that can be applied to study rates and optimization in engineering and the sciences
- Practice using statistical methods and drawing inferences from real-world data
- Learn to critique statistical analyses

### Homework

Homework will generally be assigned weekly or for each class session. Much of learning in mathematics occurs through reflection on and analysis of difficult problems, so hard problems will usually be included in the homework assignments. Students will be challenged to work on problems that involve considerable scope and depth and that require the combining of multiple mathematical techniques. Students should begin work on homework soon after it is assigned to allow time for reflection and clarifying questions in class and during office hours and tutorial. Homework will include problem sets, assignments using Mathematica, and creative projects throughout the year.

### Textbook

The course will refer to *Introduction to Mathematical Statistics*, Robert V. Hogg, Allen T. Craig, and Joseph W. McKean, 6e.



# Core Curriculum

## Assessment

Students will be assessed in a number of different ways, primarily on graded homework (which can be corrected and resubmitted), but also on individual paper/pencil quizzes, oral assessments, projects, presentations, and classwork. Students also will have numerous problem sets and free response questions, in which we expect you to maintain absolute academic integrity.

## Materials

Students will need to bring laptops along with dedicated space for notes every day. Students will also need writing implements. This class will utilize graphing, spreadsheet, and other software, available on laptops or on the internet, to complete assignments.

---

## Single-Variable Calculus



### Overview

Our study of calculus will focus on methods for dealing with arbitrarily large or arbitrarily small numbers — infinity or the infinitesimal. This intensive course in the calculus of one variable will include limits, differentiation, maxima and minima, and the chain rule for polynomials, rational functions, trigonometric functions, and exponential functions, as well as an introduction of integration with applications to area and volumes of revolution. Students' background in matrices will be combined with their new calculus skills to solve basic differential equations. Applications to medicine, physics, economics, and more will be considered. Proof work will also be emphasized strongly, both in terms of justifying the methods we practice and examining important results, such as the mean value theorem.

These are the questions that will occupy us intensely in our class. Abstraction, conceptual clarity, and symbolic complexity are juxtaposed seamlessly with practical exigencies of computation and approximation, and the engineering aesthetic for designing and constructing schemes that work.

Students in small groups will be faced with a series of modeling challenges, opportunities to learn the salient features of an application area and apply calculus concepts to clarify the relationships between interacting components. The resulting class presentations will help hone our skills at communicating mathematics effectively, bringing the right tools to bear, and using appropriate symbolic and graphical representations. This theme will be further expanded as part of year-end individual projects. Students are given the opportunity to find the mathematics we've been studying anywhere in the world they choose to look, from sports to animal feeding patterns, from domes and arches to rocket propulsion.

### Goals

- Develop knowledge of the procedures and mathematical underpinnings of calculus
- Develop skills in five process standards of mathematics: problem solving, reasoning and proof, communication, representations, and connections
- Explore mathematical concepts in ways that help students develop deep understanding of concepts
- Develop attitudes of confidence, curiosity, persistence, and inventiveness in relation to mathematics
- Improve students' ability to solve problems of varying complexity, both independently and collaboratively

### Homework

Homework serves a variety of purposes, such as practicing skills, reflecting on newly learned concepts, extending ideas from class work, introducing or previewing new concepts, and working on long-term



# Core Curriculum

assignments and projects. Homework is an opportunity to explore ideas and take risks, and perfection is not expected. You will generally have about 45 minutes of homework per 80-minute period. If you find yourself spending significantly more time, you are encouraged to discuss the matter with your teacher.

## Assessment

You will be assessed in a number of different ways, including individual paper/pencil quizzes and tests, oral assessments, projects, presentations, and classwork. You will be expected to complete a self-evaluation addressing the following areas:

- academic skills (participation, in-class productivity, study/homework habits, organization)
- mathematical process skills (problem solving, reasoning, connections, communication, and representations)
- mathematical content skills (specific to the areas we study that semester — see Canvas for learning outcomes)

## Materials

You will need a dedicated math notebook, which you will bring with you to class every day, and a folder or other receptacle for handouts and homework. You will also need writing utensils. (You may bring a graphing calculator if you like; however, you will be able to do all assignments with the software available on your laptops. If you plan to take an AP Calculus exam, it is highly recommended that you procure an nSpire calculator.

## Individual Assistance

Students should seek assistance from us, from their peers, and from other teachers. It is our belief that there is merit in having the grit and tenacity to work through problems on one's own at times. However, it is also our belief that working through problems with others (peers and teachers) is always a rich experience. We urge students to come talk to us about concerns, interests, or anything else that seems relevant.

LIMITS	DERIVATIVES	INTEGRALS
Definition of a limit Precise definition of limit — epsilon-delta proofs Limit laws Continuity Limits at infinity — end behavior L'Hôpital's rule	Derivatives of polynomial, rational, exponential, logarithmic, and trigonometric functions Product and quotient rules Chain rule Implicit differentiation Rates of change Applications of derivatives Linear approximation, extrema and inflection points, related rates and optimization Mean value theorem	Area under a curve Fundamental theorem of calculus Antiderivatives Area between curves Volume by revolution, volume by section Integration techniques like integration using substitution, trigonometric substitution, integration by parts
SEQUENCES AND SERIES		DIFFERENTIAL EQUATIONS
Sequences Series Recursive and explicit formulas Tests of convergence Taylor polynomials and power series	Slope fields Euler's method Separable equations Predator-prey systems Logistical growth	



## Multivariable Calculus



### Overview

Our study of multivariable calculus will build upon techniques learned in Single-Variable Calculus, extending the realm of applications to problems in two, three, and more dimensions. The course provides a venue for students to combine and deepen many of the mathematical techniques that they have learned in previous math courses, and to apply those techniques to problems of greater complexity. Students will generalize their knowledge of differentiation and integration to functions of several variables. In particular, students will learn to work with and visualize two- and three-dimensional functions, vectors, and vector fields. We will study techniques for working in  $n$  dimensions, including parametric equations, polar coordinates, vectors and vector operations, directional derivatives and gradients, multiple integration, line and surface integrals, Taylor's expansion in  $n$  dimensions, and Green's, Stokes' and Gauss' Theorems. Whenever possible, students will work with physical models or computer models to aid in visualization and will solve problems taken from real-world applications. We will also spend time honing formal mathematics skills by studying and performing proofs and presentations.

### Goals

Through the study of multivariable calculus, students will:

- expand their mathematical reasoning skills and aptitude for working on problems of increasing complexity
- develop their spatial sense and sharpen their ability to visualize in three dimensions
- cultivate mathematical approaches for analyzing problems in higher dimensions
- recognize and exploit novel relationships and effects that occur beyond one dimension
- learn about applications of calculus in engineering and the physical, life, and social sciences

### Homework

Homework will generally be assigned weekly. Much of learning in mathematics occurs through reflection and analysis of difficult problems, so hard problems will usually be included in the homework assignments. Students will be challenged to work on problems that involve greater scope and depth and that require the combination of multiple mathematical techniques. Students should begin work on homework soon after it is assigned to allow time for reflection, which will in turn lead to questions in class and during office hours and tutorial. Homework will include problem sets, tests and creative projects throughout the year.

### Materials

Students will need to bring with them to class every day:

- a dedicated notebook or section of a binder to record class notes and a folder to store handouts
- writing implements
- blank paper to be used for in-class work and assignments
- enthusiasm and eagerness to learn

### Assessment

Students will be expected to acquire and demonstrate mastery of the concepts we explore and proficiency in the techniques we use. A diverse array of assessment modalities will be used, including:

- classroom discussion and participation
- in-class and take-home assignments
- oral presentations to the class or one-on-one
- projects
- tests



## Linear Algebra



### Goals

Our study of linear algebra will enable students to:

- understand both the geometrical relevance of matrices and vectors as well as the algebraic structures they form
- work with abstract objects, notably vector spaces
- read and discuss mathematical texts
- prove mathematical facts rigorously
- communicate mathematical ideas precisely and constructively discuss others' work, including proofs
- apply linear algebra to a variety of problems in physics, computer science, data analysis, and more

### Overview

Linear algebra is the branch of mathematics concerning the properties of matrices. Linear algebra has wide-ranging applications in abstract algebra, functional analysis and many natural sciences and social sciences; it is particularly malleable to the student's interests, whether they be theoretical, applied, or computational. Our approach this year will give students the opportunity to acquire a number of communication and analysis skills that will benefit them in further math classes. The notions we consider can be subsequently bent to their further goals in a remarkable variety of fields, and we will periodically discuss specific examples of applications. These concepts will include vectors and vector spaces, linear transformations and matrix representations, determinants, linear dependence and independence, subspaces and bases and dimensions, orthogonal bases and projections, Gram-Schmidt orthogonalization, Cramer's Rule, linear models and least-squares problems, eigenvectors and eigenvalues, and singular value decomposition.

This course will also have a focus on developing skills in mathematical communication including reading texts, writing proofs, presenting and providing feedback on proofs, and discussing material as a class. Proof presentations will constitute a significant portion of the homework assigned.

### Homework

Homework will generally be assigned daily, and the main purpose of the homework is to prime students to participate in the next class in an active manner. Much of learning in mathematics occurs through reflection and analysis of difficult problems, so hard problems will usually be included in the homework assignments. Students will be challenged to work on problems that involve greater scope and depth and that require the combining of multiple mathematical techniques. Students should begin work on homework soon after it is assigned to allow time for reflection, which will in turn lead to questions in class and during office hours and tutorial; however, due to the difficulty of some portions of the assignments, students should not expect to complete all parts of every assignment. Students should engage with every prompt from the homework and spend a reasonable amount of time working.

### Materials

Students will need to bring with them to class every day:

- a dedicated notebook or section of a binder to record class notes and a folder to store handouts
- writing implements
- blank paper to be used for in-class work and assignments
- enthusiasm and eagerness to learn



## Assessment

Students will be expected to acquire deep understanding and mastery of the concepts covered in the class, as well as a certain degree of proficiency in the techniques we use. Assessments will be made through a number of modalities, including:

- classroom discussion and participation
- assignments
- oral presentations to the class, specifically of proofwork
- one-on-one conversations
- projects
- quizzes and tests

---

## Complex Analysis



### Goals

Our study of complex analysis will enable students to:

- understand both the geometrical relevance of the complex numbers as well as the algebraic methods of analyzing them
- work with functions of one complex variable, notably performing derivatives and integrals
- read and discuss mathematical texts
- prove mathematical facts rigorously
- communicate mathematical ideas precisely and constructively discuss others' work, including proofs
- apply complex analysis to a variety of problems in physics, computer science, data analysis, and more

### Overview

Complex analysis is a beautiful field of study from a purely theoretical point of view, as well as a powerful tool for solving a wide array of applied problems. It is related to many mathematical disciplines, including in particular real analysis, differential equations, algebra, and topology. The numerous applications include all kinds of wave propagation phenomena, such as those occurring in electrodynamics, optics, fluid mechanics and quantum mechanics, diffusion problems such as heat and contaminant diffusion, engineering tasks such as the computation of buoyancy and resistance of wings, the flows in turbines and the design of optimal car bodies, and signal processing and communication theory.

This is an introduction to the theory of analytic functions of one complex variable. While we may respond to student interest in our choice of material, the planned main topics are:

- |  |  |
|--|--|
| <ul style="list-style-type: none"><li>• the field of complex numbers</li><li>• complex derivatives</li><li>• the Cauchy-Riemann differential equations</li><li>• line integrals</li><li>• the Cauchy integral theorem</li><li>• the Cauchy integral formulas</li></ul> | <ul style="list-style-type: none"><li>• the Fundamental Theorem of Algebra</li><li>• power series of analytic functions</li><li>• singularities</li><li>• Laurent series</li><li>• the residue theorem</li><li>• applications of the residue theorem</li></ul> |
|--|--|

This course will also have a focus on developing skills in mathematical communication, including reading texts by various authors, writing proofs, presenting and providing feedback on proofs, and discussing material as a class. Proof presentations will constitute a portion of the homework assigned.



## Homework

Homework will generally be assigned daily, and the main purpose of the homework is to prime students to participate in the next class in an active manner. Much of learning in mathematics occurs through reflection and analysis of difficult problems, so hard problems will usually be included in the homework assignments. Students will be challenged to work on problems that involve considerable scope and depth and that require the combining of multiple mathematical techniques. Students should begin work on homework soon after it is assigned to allow time for reflection, which will in turn lead to questions in class and during office hours and tutorial; however, due to the difficulty of some portions of the assignments, students should not expect to complete all parts of every assignment. Students should engage with every prompt from the homework and spend a reasonable amount of time working.

## Materials

Students will need to bring with them to class every day:

- a dedicated notebook or section of a binder to record class notes and a folder to store handouts
- writing implements
- blank paper to be used for in-class work and assignments
- enthusiasm and eagerness to learn

## Assessment

Students will be expected to acquire deep understanding and mastery of the concepts covered in the class, as well as a certain degree of proficiency in the techniques we use. Assessments will be made through a number of modalities, including:

- classroom discussion and participation
- assignments
- oral presentations to the class, specifically of proofwork
- one-on-one conversations
- projects
- quizzes and tests

---

## Spanish 1



## Goals

Students will understand the benefits of learning a second language as well as some of the skills and practices needed for the successful acquisition of Spanish, broadening perspectives about communities both near and far. Students will learn to introduce themselves with regional and social contexts in mind. They will be able to describe their passions and interests and develop an understanding of how people in other cultures spend some of their leisure time. Students will be able to describe themselves and their friends. As they explore cultural traditions related to homes and families from the Spanish-speaking world, students will describe their own families, roles, activities in their communities. As the year progresses, students will construct and respond to questions, ask for what they need, and respond to the needs of others. Students also become storytellers, using their newly acquired language to retell and adapt stories, both real and imaginary. By the end of the year students should aim to reach the Novice High proficiency range set by the American Council on the Teaching of Foreign Languages (ACTFL).

## Overview

Spanish 1 is designed to build a foundation in the Spanish language, with a dual emphasis on comprehension and communication. Students begin by identifying cognates and patterns in written and spoken language. They will build their vocabulary and learn to communicate, initially with one- or two-word answers and progressing to



# Core Curriculum

phrases and simple sentences. Comprehensible and repetitive exposure to high-frequency structures is provided through visuals, physical activities, stories, readings, and conversations about students and their lives, while making space for comparisons and connections with the cultures of Spanish-speaking countries.

## Materials

A wide range of print and electronic materials, including but not limited to short novels, music, online vocabulary builders, grammar review sites, and authentic resources.

## Homework

Homework is assigned on a weekly basis and includes a selection of listening and reading activities, vocabulary practice, grammar review, cultural resources and more. Students select which activities to complete based on need and interest. Students reflect on their learning in their journals, demonstrating understanding of the work completed. Feedback is provided on a regular basis and students are encouraged to review and edit as necessary.

## Assessment

Students will be asked to participate daily in class, demonstrating comprehension of activities, discussions, and stories through frequent questions, retells, and rewrites. Quizzes and journals will allow students to demonstrate vocabulary knowledge and understanding of grammar. Summative assessments will include, but are not limited to, collaborative and individual projects, both research and task-based, story rewrites and in-class discussions.

---

# Spanish 2



## Overview

The Spanish 2 course is designed for students to continue developing the skills and practices needed for the successful acquisition of the Spanish language, broadening perspectives about communities both near and far. Students continue their study of Spanish by further expanding their knowledge of key vocabulary topics and grammar concepts. They comprehend listening and reading passages more fully and express themselves more meaningfully and with greater spontaneity in both speaking and writing.

## Goals

By the end of the year, students should aim to reach the Intermediate low/mid proficiency range as set by the American Council on the Teaching of Foreign Languages (ACTFL). These include the ability to:

- participate in conversations on a number of familiar topics using simple sentences
- handle short social interactions in everyday situations by asking and answering simple questions
- verbally present information on most familiar topics using a series of simple sentences
- write on a wide variety of familiar topics using connected sentences to form some simple paragraphs
- understand the main idea in short, simple messages and presentations on familiar topics
- understand the main idea of simple conversations that are overheard
- understand the main idea of texts related to everyday life and personal interests or studies
- be aware of subtle cultural difference in familiar situations and adjust language or behavior for specific audiences
- analyze and explain relationships between familiar products, practices, and perspectives

## Materials

These include a wide range of Spanish books, newspapers and journals, podcasts and interviews, short stories, poems, songs, vocabulary practice and grammar review websites, and documentaries and short films.



# Core Curriculum

## Homework

Students can expect 90 minutes of homework per week, ideally completed on days class does not meet. Homework is designed to directly support what is learned in class and will include material related to vocabulary, grammar, and cultural studies. Assignments will range from creative projects to vocabulary and grammar practice. Students are encouraged to think critically about the language structures being used and bring questions to class for clarification and discussion. Daily vocabulary practice is also highly encouraged. Students are responsible for completing and submitting all homework assignments on time, before class on the days they are due.

## Assessment

Students will be asked to participate daily in class, demonstrate comprehension of activities, discussions and stories through frequent questions, re-tells and re-writes. Quizzes and journals will allow students to demonstrate vocabulary knowledge and understanding of grammar. Summative assessments will include, but are not limited to, collaborative and individual projects (both research and task-based), story re-writes, and in-class discussions.

---

---

## Spanish 3



### Overview

Through individual and collaborative learning activities, members of the Level 3 class will understand how life experiences shape identity, discuss cultural celebrations in Spanish-speaking countries, consider the relationship between life and the arts, discuss perspectives on travel, explore the impact of technology on our lives, and describe some environmental issues that pose challenges to society.

Students will review and master the preterit, imperfect, and present perfect tenses, while implementing the present subjunctive mood in various contexts. They will review the future and conditional tenses and use them to describe predictions and hopes. Students will also learn to express desires and give instructions using the Imperative, and will also cover the passive voice and impersonal statements. Along with building knowledge in these content areas, the class will focus on developing student's skills in Interpersonal Communication, Presentational Speaking and Writing, and Interpretive Reading and Listening.

### Goals

Students in Spanish 3 will review and strengthen their understanding of essential Spanish grammar and build on the foundation of previous courses. They will expand their vocabulary and increase in fluency through frequent conversational practice and presentations, readings, creative projects and research on cultural topics.

Throughout the year, students should progress through the standards of the American Council on the Teaching of Foreign Languages (ACTFL). They should increase their ability to express needs and wishes, write increasingly cohesive passages, and present clearly and articulately using complex sentences. Their higher-level listening and reading comprehension should allow them to identify main ideas and comment on what they hear, and identify and describe key points in authentic articles.

### Materials

A wide range of Spanish books, Spanish language newspapers and journals, podcasts and interviews, short stories, poems, songs, vocabulary practice and grammar review websites, and presentations, documentaries, and short films. Students will also have the option to utilize electronic or physical journals throughout the year.

### Homework

Students will be assigned homework most classes. This work often includes reading and viewing assignments, vocabulary practice, and grammar review in preparation for upcoming classes. Completing these assignments in



a timely manner is essential for effective use of class time, consistent exposure to the language, and long-term acquisition. It is recommended that assignments are completed on days we do not meet as a class.

## Assessment

Students will be asked to keep a reflection journal, as well as participate daily in class. Summative assessments will include but are not limited to projects, compositions, and in-class and online debates and discussions.

---

---

## Spanish 4



### Overview

The Spanish 4 curriculum refines and enhances students' language skills, developing their ability to communicate effectively in oral and written Spanish within a thematic context. Students move toward less structure and more cumulative knowledge and self-initiated responses. Students will broaden their understanding of cultures from Spanish-speaking communities around the world, relating them to their own experiences. The course will focus on six essential themes: global challenges, beauty and aesthetics, families and communities, personal and public identities, contemporary life, and science and technology. Students will explore each theme through written and audio resources, acquire new vocabulary, and practice writing and speaking formally and informally. The course emphasizes the use of language for active communication and is conducted entirely in Spanish.

### Goals

As we progress through the year we will search for ways to communicate thoughts and opinions in more detailed and complex ways. Students will understand that there are multiple ways to express the same idea and that linguistic risk takes courage but is essential to growth. Throughout the year, students will think critically and express themselves clearly about relationships, quality of life and how individuals and communities define it, the arts and how they reflect the history and culture of a people, and regional expressions and how language defines group identity. Each semester students will choose a Spanish-speaking country through which they will explore our units of study, which will lead to a greater understanding and appreciation of perspectives. By the end of the year students should aim to reach the Intermediate High proficiency range set by the American Council on the Teaching of Foreign Languages (ACTFL).

### Materials

A wide range of Spanish books, Spanish language newspapers and journals, podcasts and interviews, short stories, poems, songs, vocabulary practice and grammar review websites and presentations, documentaries, and short films. Students will be provided with physical journals for use throughout the year and are expected to maintain them.

### Homework

Students will be assigned homework most classes. This work often includes reading, listening, and viewing assignments, vocabulary practice, and grammar review in preparation for upcoming classes. Completing these assignments in a timely manner is essential for effective use of class time, consistent exposure to the language, and long-term acquisition. It is recommended that assignments are completed on days we do not meet as a class to provide more frequent exposure.

### Assessment

Students will be asked to keep a reflection journal, as well as participate daily in class. Summative assessments will include but are not limited to projects, compositions, and in-class and online debates and discussions.



## Advanced Spanish: Journey through the Labyrinth



### Overview

This course is an overview of Latin America's artistic production (mainly literary and cinematic), via a historical trajectory from Discovery and Conquest to the post-modern day. Throughout Latin America's participation in Western history, this underdeveloped region of the world has proved to be a fertile field for the cultivation of political ideologies. It is not surprising that issues such as race, nation, class, and gender are ciphers for the forking cultural paths that Latin America has been destined to travel since the days of the Conquest. These complex issues have formed, metaphorically, a vast labyrinth. This course provides a critical understanding of Latin America's aesthetic production as a mirror of its frustrated historical development. Major aesthetic influences and movements are studied within the context of Spanish-American artistic production. The course also offers an overview of the most salient moments in Spanish-American cultural history, placing emphasis on the ways in which specific aesthetic works relate to the social, political, and economic developments that have shaped the region from the early colonial period to the 21<sup>st</sup> century.

### Goals

- The course will provide a chronological examination of Latin America's cornerstone fictional texts from the colonial era to the 21st century. Through the study of these texts, students will become familiar with the ideas that have shaped Latin America's cultural landscape. Through careful analysis of these fictional works, students will be able to discuss specific problematic issues stemming from Latin America's circumstances that have plagued the continent.
- This course will also provide students with a general understanding of Latin America's major political and aesthetic preoccupations in relation to the mainstream of Western culture.
- Since Latin American literature can be understood in a historical/political context, students will acquire a more comprehensive view of the continent's cultural heritage. This course then, will provide students with a better understanding of a culture significantly different from their own.
- Students will be exposed to critical approaches to literary texts and to the language of literary criticism. The class will reinforce students' ability to do a "close reading" of a text. Therefore, one of the goals of this course is to promote critical thinking skills for analysis, evaluation, and synthesis through oral discussions, reading, and writing.
- Geared toward the students of literature, but not limited to them, this course will enrich the students' knowledge with a global perspective of the literary world. At the same time it will expand students' knowledge of literature by providing a general framework by which to compare other fictional works.
- Students will develop further the four basic language skills in Spanish (reading, writing, speaking, and listening).

### Materials

All reading and viewing materials will be supplied by the teacher

### Homework

Students will have reading and/or writing homework to prepare for each class meeting. They are expected to come to class having completed the reading of the day. In order to facilitate the understanding of any text, students are expected to keep a notebook in which they will make annotations (personal observations, subjective reactions, questions, etc.). During class, students should be prepared to ask questions and to call for clarification.

### Assessment

Students will receive verbal and written feedback on their ability to synthesize close reading and historical and cultural context. Students will also be required to write short narratives about literary texts and formal analytical



essays that will demonstrate their ability to think critically. Active class participation will also be part of the evaluation process.

---

## Advanced Spanish: Current Events



### Overview

This course explores contemporary issues in Spain and the Americas. Guided by current events and through a variety of readings, film viewings, discussions, interviews, music, and social media, we will engage more closely with the culture, politics, and social and human landscape of the Spanish-speaking world. Students will continue to build vocabulary, idiomatic expressions, and grammatical control with the goal of developing their interpretive, interpersonal, and presentational skills and progressing through ACTFL's Advanced proficiency standards. Students will read and analyze texts, give oral and written presentations, and participate in discussions and debates related to the topics of study. A key component of this course will be developing relationships with native speakers to gather a variety of perspectives and opinions.

### Materials

A wide selection of Spanish-language newspapers, as well as books, plays, movies, documentaries, short stories, and songs from the 20th and 21st centuries. Students should bring their journal and computer to each class.

### Homework

Ninety minutes of homework will be assigned weekly. Homework often includes reading, audiovisual resources, vocabulary practice, and grammar review in preparation for upcoming classes. Completing these assignments in a timely manner is essential for effective use of class time, consistent exposure to the language, and long-term acquisition. It is recommended that assignments be completed on days we do not meet as a class to provide more frequent exposure to the language. Students might also break assignments into smaller chunks when there are 3 or more days between classes.

### Assessment

- Daily participation in class discussions
- Semester-long reflection journal
- Summative assessments, including but not limited to projects, compositions, and in-class and online debates and discussions

---

## Chinese 2



### Overview

The Chinese program provides the students opportunities to incorporate communication, collaboration, and technology skills in learning China's language and its rich culture. Chinese 2 starts with an expansion of vocabulary and sentence structures built on top of Chinese 1 (or equivalent) content through dialogue creation, reading, listening, and writing. This course will follow roughly Lessons 9–16 on *Integrated Chinese Level 1* (Parts 1 and 2) and cover topics including, but not limited to, shopping, transportation, weather, dining, directions, etc. In addition to colloquial Mandarin, students are exposed to more formal written language with stories and songs. While advancing in reading and creative writing, students in Chinese 2 dive deeper into cultural comparisons and 21st century world citizenship through group projects and comic/drama production.



# Core Curriculum

## Goals

Chinese 2 is the second-year Chinese program. Its primary focus is to further enhance students' Chinese language skills in more complex scenarios and language contexts that require critical thinking and innovation skills. Students are en route to solidifying the habit of independent study and collaborative learning in order to become lifelong learners of the Chinese language. This course prepares the students to achieve a proficiency level of Novice-high to Intermediate-low across interpretive, interpersonal, and presentational communications (based on the ACTFL standards) at the end of the school year.

## Homework

Homework is assigned after each class meeting to reinforce learning. Students are expected to spend approximately 40 minutes on homework after each class meeting, but individual differences are recognized. Online resources and digital and printed materials will be distributed to the students for listening, speaking, reading, and writing assignments. The purpose of each assignment is to strengthen the study of the current lesson and to prepare for upcoming units; it should be completed on time with accuracy to ensure a smooth learning flow.

## Assessment

Written assessments will be given at the end of each sub-unit and 2 or 3 oral assessments will be given each semester. Additionally, vocabulary quizzes, class preparation and participation, individual/collaborative projects, and essays are used to gauge students' progress. If a student needs more time to complete homework, the student should contact the instructor before the homework is due.

## Materials & Resources

*Integrated Chinese, Level 1 Part 1 & Part 2, 3rd Edition* | Cheng & Tsui

---

# Chinese 3



## Overview

The Chinese program provides the students opportunities to incorporate communication, collaboration, and technology skills in learning the Chinese language and its rich culture. The Level 3 Chinese course is composed of themes and units about decision-making and planning. Topics include, but are not limited to, directions, seeing a doctor, dating, living space, sports, and travel. The course will roughly follow Lessons 13–20 in *Integrated Chinese Level 1 (Part 2)* and loosely *Zhēn Bàng!* Level 1, Units 4–6. Correlated cultural topics are introduced with each unit for further exploration and comparison. In addition to the new vocabulary and sentence structures introduced in each unit, the students will be further immersed in an authentic environment through Chinese short stories, songs, news segments, TV series, and animated videos.

## Goals

Chinese 3 is the third-year Chinese program. Its primary focus is to equip the students with expressions, styles, and language structures of higher complexity in both oral and written communication for various purposes. Students will learn to further differentiate between speaking and writing the words and phrases essential for higher-level social functions. This course prepares the students to achieve a proficiency level of Intermediate-low to Intermediate-mid across interpretive, interpersonal, and presentational communications (based on the ACTFL standards) at the end of the school year.

## Homework

Homework is assigned after each class meeting to reinforce learning and daily communication in Chinese. Students are expected to spend approximately 40 minutes on homework after each class meeting, but individual differences are recognized. Online resources, digital files, and printed materials will be distributed to the



# Core Curriculum

students for listening, speaking, reading, and writing assignments. The purpose of each assignment is to strengthen the study of the current lesson and to prepare for upcoming units; it should be completed on time with accuracy to ensure a smooth learning flow. If a student needs more time to complete any assignment, the student should contact the instructor before the assignment is due.

## Assessment

Written assessments will be given at the end of each sub-unit. Additionally, quizzes, class preparation and participation, individual/collaborative projects, and essays are used to gauge students' progress.

## Materials & Resources

- *Integrated Chinese*, Level 1 Part 2, 3rd Edition | Cheng & Tsui
- *Zhēn Bàng!* Level 1, Units 4–6 | EMC Publishing LLC

---

## Chinese 4



### Overview

The Chinese program provides the students opportunities to incorporate communication, collaboration, and technology skills in learning the Chinese language and its rich culture. The Level 4 Chinese course comprises themes and units about modernization and environmental issues. Correlated cultural topics are introduced with each unit for further exploration and comparison. In addition to regular language units, students will study biographies, news segments, crosstalk, and movies to manage a self-paced, individualized learning progress based on personal interests. Level 4 students will also conduct interviews and periodically publish bilingual newsletters in Chinese and English.

### Goals

The primary focus of the fourth-year Chinese program is to guide the students in creative writing as well as formal speaking through a full immersion forum. Students will learn to lead discussions in Mandarin and brainstorm solutions for selected issues. This course prepares the students to achieve a proficiency level of Intermediate-mid to Intermediate-high (based on the ACTFL standards) across interpretive, interpersonal, and presentational communications at the end of the school year.

### Homework

Homework is assigned after each class meeting to reinforce learning and daily communication in Chinese. Students are expected to spend at least 45 minutes per class meeting on homework or self-study. Online resources and digital and printed materials will be assigned for listening, speaking, reading, writing, and typing assignments. A variety of online tools will be used for homework and projects. Each assignment strengthens the study of the current lesson and prepares for upcoming units, and should be completed accurately and on time to ensure a smooth learning flow. Students should contact the instructor in advance for any due-date extensions or problems encountered.

### Assessment

Oral, written, and typing assessments will be given at the end of each topic and subunit. Additionally, class participation and individual/collaborative projects and presentations will be used to gauge students' progress.

## Materials & Resources

- *Zhēn Bàng!* Level 3 | EMC Publishing LLC
- *Integrated Chinese*, Level 2 Part 1, 4th Edition | Cheng & Tsui
- Chinese Biographies, <http://chinesebiographies.cheng-tsui.com>
- Learning Chinese Language and Culture from Movies | LiveABC



## Chinese 5



### Overview

The Chinese program provides students with opportunities to incorporate communication, collaboration, and technology skills in learning China's language and its rich culture. The Level 5 Chinese course is composed of themes and units about the dynamics among individual identity, history, societal conflicts, social and economic impacts, and global concerns within the Chinese-speaking diaspora. Students will study materials from newspaper articles, TV programs, documentaries, and social media posts to conduct a self-paced, individualized learning based on personal interests and skills. Students will use critical thinking skills to access and evaluate information and diverse perspectives that their Mandarin skills make available. Level 5 students will also periodically conduct interviews and create news videos and talk shows about current events in Chinese.

### Goals

Chinese 5 is the fifth-year Chinese program. Its primary focus is to further explore topics related to Chinese history, culture, economic growth, social challenges, and modernization in order to develop a wider and deeper understanding of Chinese-speaking communities and to bridge the differences between the East and the West. Students in Chinese 5 will continue to lead discussions in Mandarin, brainstorming solutions for issues of interest and debating various topics related to current events. This course prepares the students to achieve a proficiency level of Intermediate-high to Advanced-low across interpretive, interpersonal, and presentational communications (based on the ACTFL standards) at the end of the school year.

### Homework

Homework is assigned after each class meeting to reinforce learning and daily communication in Chinese. Students are expected to spend 40 minutes on homework after each class meeting, but individual differences are recognized. Online resources and digital and printed materials will be distributed to the students for listening, speaking, reading, writing, and typing assignments. The purpose of each assignment is to strengthen the study of the current lesson and to prepare for upcoming units; therefore, it should be completed accurately and on time to ensure a smooth learning flow. If a student needs more time to complete an assignment, the student should contact the advisor before the assignment is due.

### Assessment

Written assessments (analytic essay) will be given at the end of each unit. Additionally, quizzes, class preparation and participation, individual/collaborative projects, presentations, and written paragraphs are used to gauge students' progress.

### Materials & Resources

*Readings in Chinese Culture Series*, Vols. 2–4 | Cheng & Tsui

*China's Development and Dilemmas*, 2018 | Cheng & Tsui

Various media, based around the world

---

## Japanese 1



### Overview

Welcome to Japanese 1! This is a yearlong course that develops students' reading, writing, speaking, and listening skills in Japanese through a systematic introduction and integration of grammar, vocabulary, kanji, and culture, using a communicative approach informed by ACTFL's five C's of foreign language education



# Core Curriculum

(Communication, Cultures, Connections, Comparisons, and Communities). Assignments and assessments emphasize the three basic modes of communication: the interpersonal, the interpretive, and the presentational. For example, students are required to speak Japanese through short conversations and role-plays, to read and analyze authentic materials in Japanese such as diaries and films, and to produce short oral presentations and written essays in Japanese. In addition, students study important topics in Japanese culture, such as Japanese food, geography, and history. The course roughly follows *Genki I* (Chapters 1–6), but I also use a number of other textbooks and resources, such as *A Dictionary of Basic Japanese Grammar*, *Adventures in Japanese* (Volumes 1–2) and authentic materials taken from Japanese literature, film, and popular culture (e.g., manga, music, and television). Students learn to read and write both hiragana and katakana characters, and approximately 50 new kanji (Chapters 1–3 of *Kanji Look and Learn*). Students can also deepen their language skills and cultural knowledge through an optional trip to Japan during the spring semester.

## Goals

The primary goal of this course is to improve students' reading, writing, speaking, and listening skills in Japanese so that students can function in a variety of real-life settings and situations in Japanese. The aim is for students to achieve Novice Mid in Japanese, as defined by the American Council on the Teaching of Foreign Languages (ACTFL). At the same time, this course aims to deepen students' knowledge and understanding of various aspects of Japanese culture through the use of Japanese, enabling them to make connections and comparisons between Japanese and other languages, cultures, and courses, developing their critical thinking skills and helping them become global citizens. Finally, this course strives to make students lifelong learners of Japanese by connecting them to a larger community of Japanese speakers, both inside and outside of school, and by making them more comfortable and confident expressing themselves in Japanese.

## Homework

Homework is created, developed, and assigned by the instructor to recap and deepen each day's work. Homework will be assigned regularly — grammar assignments will vary with the syntax being learned. Hiragana, katakana, and kanji assignments will mostly follow worksheet formats so that students can really focus on practicing specific characters and reinforce their learning. Students are expected to spend at least 20 to 30 minutes on homework, depending on the assignment for a particular day. The worksheet and materials for assignments are provided in class and made available through Canvas.

## Assessment

Students' progress will be assessed and evaluated on a regular basis — a grading template is available through Canvas. The template categorizes work into three parts: content knowledge, skills and practices, and habits of mind. Students often receive immediate feedback through the classroom language activities. If it is not immediate, such as a vocabulary quiz, students receive it in a timely manner so that they know how to improve.

## Materials

### Textbook

Banno, Eri, et al., eds. *GENKI: An Integrated Course in Elementary Japanese I* (with CD-ROM). 2nd ed. Japan Times/Tsai Fong Books, 2011.

### Workbooks

Banno, Eri, et al., eds. *GENKI: An Integrated Course in Elementary Japanese Workbook I*. 2nd ed. Japan Times/Tsai Fong Books, 2011.

Banno, Eri, et al., eds. *Kanji Look and Learn Workbook*. Tokyo: The Japan Times, 2009.



## Japanese 2



### Overview

Building on Japanese 1 or the equivalent, Japanese 2 is a yearlong course that develops students' reading, writing, speaking, and listening skills in Japanese through a systematic introduction and integration of grammar, vocabulary, kanji, and culture, using a communicative approach informed by ACTFL's five C's of foreign language education (Communication, Cultures, Connections, Comparisons, and Communities). Assignments and assessments emphasize the three basic modes of communication: the interpersonal, the interpretive, and the presentational. For example, students are required to speak Japanese through short conversations and role-plays, to read and analyze authentic materials in Japanese such as diaries and films, and to produce short oral presentations and written essays in Japanese. In addition, students study important topics in Japanese culture, such as Japanese food, geography, and history. The course roughly follows the second half of Genki I, but it also uses a number of other textbooks and resources, such as Adventures in Japanese and authentic materials taken from Japanese literature, film, and popular culture (i.e., manga, music, and television). Students learn to read and write approximately 100–120 new kanji (Chapters 1–8 of Kanji Look and Learn). Students can also deepen their language skills and cultural knowledge through an optional trip to Japan during the spring semester.

### Goals

The primary goal of this course is to improve students' reading, writing, speaking, and listening skills in Japanese so that students can function in a variety of real-life settings and situations in Japanese. The aim is for students to achieve Novice Mid to Novice High proficiency in Japanese, as defined by the American Council on the Teaching of Foreign Languages (ACTFL). At the same time, this course aims to deepen students' knowledge and understanding of various aspects of Japanese culture through the use of Japanese, enabling them to make connections and comparisons between Japanese and other languages, cultures, and courses, developing their critical thinking skills and helping them become global citizens. Finally, this course strives to make students lifelong learners of Japanese by connecting them to a larger community of Japanese speakers, both inside and outside of school, and by making them more comfortable and confident expressing themselves in Japanese.

### Homework

Homework is essential for reviewing and reinforcing concepts learned in class. For this reason, students will be assigned homework on a regular basis through the online learning management system Canvas. Students are expected to spend approximately 90 minutes total on homework or self-study per week. Homework may include, but is not limited to, workbook exercises, *kanji* practice sheets, questions designed by the instructor, and online exercises. From time to time, students may be asked to do other tasks at home, such as preview or review the textbook or other materials, study online resources, and prepare for individual or group projects. Late or incomplete homework assignments will have a negative impact on a student's final grade. If a student is having trouble with homework or needs more time to finish it, he or she must contact the instructor before class time, preferably at least one day before. Otherwise the homework will be counted as late or incomplete.

### Assessment

Students will be assessed regularly using a standards-based grading template that is available on Canvas. This template covers three main categories: content knowledge, skills and practices, and habits of mind. For certain assignments, such as projects and presentations, students will be given more specific guidelines and rubrics. Formal assessments may include, but are not limited to:

- tests and quizzes (written, oral, and aural)
- homework and other assignments
- classroom activities
- projects
- presentations



# Core Curriculum

Students will receive regular oral and written feedback on their progress and performance. There will also be chances for self-assessment and self-reflection during the year.

## Materials

### Textbook

Banno, Eri, et al., eds. *GENKI: An Integrated Course in Elementary Japanese I (with CD-ROM)*. 2nd ed. Japan Times/Tsai Fong Books, 2011.

### Workbooks

Banno, Eri, et al., eds. *GENKI: An Integrated Course in Elementary Japanese Workbook I*. 2nd ed. Japan Times/Tsai Fong Books, 2011.

Banno, Eri, et al., eds. *Kanji Look and Learn Workbook*. Tokyo: The Japan Times, 2009.

The instructor will provide additional instructional materials.

---

---

## Japanese 3



### Overview

Building on Japanese 2 or the equivalent, Japanese 3 is a yearlong course that develops students' reading, writing, speaking, and listening skills in Japanese through a systematic introduction and integration of grammar, vocabulary, kanji, and culture. Using a communicative approach informed by the five C's of foreign language education as defined by the American Council on the Teaching of Foreign Languages (Communication, Cultures, Connections, Comparisons, and Communities), this course enables students to achieve Novice High to Intermediate Low proficiency in Japanese. In assignments and assessments, equal emphasis is given to the three basic modes of communication: the interpersonal, the interpretive, and the presentational. For example, students are required to speak Japanese through skits and role-plays, to read and analyze authentic materials in Japanese such as folktales and films, and to produce short oral presentations and written essays in Japanese. In addition, students study important topics in Japanese culture such as folklore, food, and gift-giving. The course focuses on the latter half of *Genki I* and the first half of *Genki II*, but it also uses a number of other textbooks and resources, such as *Adventures in Japanese* and authentic materials taken from Japanese literature, film, and popular culture (i.e., manga, music, and television). Students learn to read and write approximately 100–120 new kanji (Chapters 9–15 of *Kanji Look and Learn*). Students can also deepen their language skills and cultural knowledge through an optional trip to Japan during the spring semester.

### Goals

The primary goal of this course is to improve students' reading, writing, speaking, and listening skills in Japanese so that students can function in a variety of real-life settings and situations in Japanese. The aim is for students to achieve Novice High to Intermediate Low proficiency in Japanese, according to ACTFL standards. At the same time, this course aims to deepen students' knowledge and understanding of various aspects of Japanese culture through the use of Japanese. The goal is for students to make connections and comparisons between Japanese and other languages, cultures, and courses, thereby developing student's critical thinking skills and helping them become global citizens. Finally, this course strives to make students lifelong learners of Japanese by connecting them to a larger community of Japanese speakers, both inside and outside of school, and by making them more comfortable and confident expressing themselves in Japanese.

### Homework

Homework is essential for reviewing and reinforcing concepts learned in class. For this reason, students will be assigned homework on a regular basis through the online learning management system Canvas. Students are expected to spend approximately 90 minutes total on homework or self-study per week. Homework may



# Core Curriculum

include, but is not limited to: workbook exercises, kanji practice sheets, and application exercises. From time to time, students may be asked to do other tasks at home, such as preview or review the textbook, study online resources, and prepare for individual or group projects. Late or incomplete homework assignments will have a negative impact on a student's final grade. If a student is having trouble with homework or needs more time to finish it, he or she must contact the instructor before class time, preferably 24 hours in advance. Otherwise the homework will be counted as late or incomplete.

## Assessment

Students will be assessed regularly using a standards-based grading template that is available on Canvas. This template covers three main categories: content knowledge, skills and practices, and habits of learning. For certain assignments, such as projects and presentations, students will be given more specific guidelines and rubrics. Formal assessments may include, but are not limited to:

- tests and quizzes (written, oral, and aural)
- homework and other assignments
- classroom activities
- projects
- presentations

Students will receive regular oral and written feedback on their progress and performance. There will also be chances for self-assessment and self-reflection during the year.

## Materials

### Textbooks

Banno, Eri, et al., eds. *GENKI: An Integrated Course in Elementary Japanese I (with CD-ROM)*. 2nd ed. Japan Times/Tsai Fong Books, 2011.

Banno, Eri, et al., eds. *GENKI: An Integrated Course in Elementary Japanese II (with CD-ROM)*. 2nd ed. Japan Times/Tsai Fong Books, 2011.

### Workbooks

Banno, Eri, et al., eds. *GENKI: An Integrated Course in Elementary Japanese Workbook I*. 2nd ed. Japan Times/Tsai Fong Books, 2011.

Banno, Eri, et al., eds. *GENKI: An Integrated Course in Elementary Japanese Workbook II*. 2nd ed. Japan Times/Tsai Fong Books, 2011.

Banno, Eri, et al., eds. *Kanji Look and Learn Workbook*. Tokyo: The Japan Times, 2009.

The instructor will provide additional instructional materials.

---

---

## Japanese 4



### Overview

Building on Japanese 3 or the equivalent, Japanese 4 is a yearlong course that develops students' reading, writing, speaking, and listening skills in Japanese through a systematic introduction and integration of grammar, vocabulary, kanji, and culture, using a communicative approach informed by ACTFL's five C's of foreign language education (Communication, Cultures, Connections, Comparisons, and Communities). Assignments and assessments emphasize the three basic modes of communication: the interpersonal, the interpretive, and the presentational. For example, students are required to speak Japanese through skits and speeches, to read and analyze authentic materials in Japanese such as short stories and essays, and to write presentations and essays in Japanese. In addition, students study important topics in Japanese society and culture such as politeness and humility, aging and the family, and World War II. The course roughly follows the first half of *Genki II*, but it also



# Core Curriculum

uses a number of other textbooks and resources, such as *Adventures in Japanese* and authentic materials taken from Japanese literature, film, and popular culture (i.e., manga, music, and television). Students learn to read and write approximately 100–120 new kanji (Chapters 16–22 of *Kanji Look and Learn*). Students can also deepen their language skills and cultural knowledge through an optional trip to Japan during the spring semester.

## Goals

The primary goal of this course is to improve students' reading, writing, speaking, and listening skills in Japanese so that students can function in a variety of real-life settings and situations in Japanese. The aim is for students to achieve Intermediate Low to Intermediate Mid proficiency in Japanese, as defined by the American Council on the Teaching of Foreign Languages (ACTFL). At the same time, this course aims to deepen students' knowledge and understanding of various aspects of Japanese culture through the use of Japanese, enabling them to make connections and comparisons between Japanese and other languages, cultures, and courses, developing their critical thinking skills and helping them become global citizens. Finally, this course strives to make students lifelong learners of Japanese by connecting them to a larger community of Japanese speakers, both inside and outside of school, and by making them more comfortable and confident expressing themselves in Japanese.

## Homework

Homework is essential for reviewing and reinforcing concepts learned in class. For this reason, students will be assigned homework on a regular basis through the online learning management system Canvas. Students are expected to spend approximately 90 minutes total on homework or self-study per week. Homework may include, but is not limited to, workbook exercises, *kanji* practice sheets, questions designed by the instructor, and online exercises. From time to time, students may be asked to do other tasks at home, such as preview or review the textbook or other materials, study online resources, and prepare for individual or group projects. Late or incomplete homework assignments will have a negative impact on a student's final grade. If a student is having trouble with homework or needs more time to finish it, he or she must contact the instructor before class time, preferably at least one day before. Otherwise the homework will be counted as late or incomplete.

## Assessment

Students will be assessed regularly using a standards-based grading template that is available on Canvas. This template covers three main categories: content knowledge, skills and practices, and habits of learning. For certain assignments, such as projects and presentations, students will be given more specific guidelines and rubrics. Formal assessments may include, but are not limited to:

- tests and quizzes (written, oral, and aural)
- homework and other assignments
- classroom activities
- projects
- presentations

Students will receive regular oral and written feedback on their progress and performance. There will also be chances for self-assessment and self-reflection during the year.

## Materials

### Textbook

Banno, Eri, et al., eds. *GENKI: An Integrated Course in Elementary Japanese II (with CD-ROM)*. 2nd ed. Japan Times/Tsai Fong Books, 2011.

### Workbooks

Banno, Eri, et al., eds. *GENKI: An Integrated Course in Elementary Japanese Workbook II*. 2nd ed. Japan Times/Tsai Fong Books, 2011.

Banno, Eri, et al., eds. *Kanji Look and Learn Workbook*. Tokyo: The Japan Times, 2009.

The instructor will provide additional instructional materials.



## Advanced Topics in Japanese



### Overview

Building on Japanese 4 or the equivalent, Advanced Topics in Japanese is a yearlong course that develops students' reading, writing, speaking, and listening skills in Japanese through a topics-based study of grammar, vocabulary, kanji, and culture. Using a communicative approach informed by the five C's of foreign language education as defined by the American Council on the Teaching of Foreign Languages (Communication, Cultures, Connections, Comparisons, and Communities), this course enables students to achieve Intermediate High to Advanced Low proficiency in Japanese. Assignments and assessments emphasize the three basic modes of communication: the interpersonal, the interpretive, and the presentational. For example, students are required to do skits and speeches, to read and analyze authentic materials in Japanese, and to discuss advanced topics in Japanese. These topics change yearly, depending on student enrollment and interests. This year the topics include: *Tale of Genji*, history, arts, high-tech, philosophy/artificial intelligence, etc.. Possible projects include: making presentations on Heian era from various aspects from architecture, geography, politics, and poetry, reading literature, and an individual research project. The course uses a variety of advanced Japanese textbooks and multimedia instructional materials (see **Materials** below). Students continue their study of kanji using the *Kanji Look and Learn* and *Tobira: Power Up Your Kanji* workbooks. Students can also deepen their language skills and cultural knowledge through an optional trip to Japan during the spring semester.

### Goals

The primary goal of this course is to improve students' reading, writing, speaking, and listening skills in Japanese so that students can function in a variety of real-life settings and situations in Japanese. The aim is for students to achieve Intermediate High to Advanced Low proficiency in Japanese, according to ACTFL standards. At the same time, this course aims to deepen students' knowledge and understanding of various aspects of Japanese culture through the use of Japanese. The goal is for students to make connections and comparisons between Japanese and other languages, cultures, and courses, thereby developing students' critical thinking skills and helping them become global citizens. Finally, this course strives to make students lifelong learners of Japanese by connecting them to a larger community of Japanese speakers, both inside and outside of school, and by making them more comfortable and confident expressing themselves in Japanese.

### Homework

Homework is essential for reviewing and reinforcing concepts learned in class. For this reason, students will be assigned homework on a regular basis through the online learning management system Canvas. Students are expected to spend approximately 90 minutes total on homework or self-study per week. Homework may include, but is not limited to, readings, online viewings, grammar exercises, kanji practice sheets, and questions prepared by the instructor. From time to time, students may be asked to do other tasks at home, such as preview or review the textbook, study online resources, and prepare for individual or group projects. Late or incomplete homework assignments will have a negative impact on a student's final grade. If a student is having trouble with homework or needs more time to finish it, he or she must contact the instructor before class time, preferably 24 hours in advance. Otherwise the homework will be counted as late or incomplete.

### Assessment

Students' progress will be assessed and evaluated on a regular basis — a grading template is available through Canvas. The template categorizes work into three parts: content knowledge, skills and practices, and habits of mind. Students often receive immediate feedback through the classroom language activities. If it is not immediate, such as a vocabulary quiz, students receive it in a timely manner so that they know how to improve.



# Core Curriculum

## Materials

### Textbooks

- Oka, Mayumi, et al., eds. *Tobira: Gateway to Advanced Japanese Learning Through Content and Multimedia*. Tokyo: Kuroshio Publishers, 2009.

### Additional Textbooks

- Peterson, Hiromi; Naomi Hirano-Omizo; and Junko Ady, eds. *Further Adventures in Japanese: An Advanced Course, Suitable for AP Preparation*. Boston: Cheng & Tsui Company, 2009.
- Peterson, Hiromi; Naomi Hirano-Omizo; and Junko Ady, eds. *Strive for a 5: AP Japanese Practice Tests*. Boston: Cheng & Tsui Company, 2009.

### Workbooks

- Banno, Eri, et al., eds. *Kanji Look and Learn Workbook*. Tokyo: The Japan Times, 2009.
- Oka, Mayumi, et al., eds. *Tobira: Power Up Your Kanji*. Tokyo: Kuroshio Publishers, 2010.

Note: The instructor will provide additional instructional materials.



## Special Programs



## Physical Education



### Program Overview & Offerings

The upper school Physical Education and Athletics program supports Nueva's core educational goals and helps students capture the social, emotional, and physical benefits of healthy competition. Students learn to enjoy lifelong physical benefits and overall fitness as a result of their participation. A variety of interscholastic sports and physical education classes is offered each year.

#### Graduation Requirement

Participation in two out of three seasons a year for all four years of high school

- Fall (September–November)
- Winter (November–February)
- Spring (February–May)

Students may choose one of these options in a season to fulfill their graduation requirement:

#### OPTION #1: Participation on a Nueva Interscholastic Team

We value and encourage student participation on Nueva athletic teams. Due to the significant commitment required of a Nueva team, students can fulfill their yearly two-season requirement through a *single* season of an interscholastic sport.

#### *Interscholastic offerings for 2019–20*

- Girls' Volleyball (Fall)
- Girls' Tennis (Fall)
- Girls' & Boys' Cross-Country (Fall)
- Girls' & Boys' Basketball (Winter)
- Girls' & Boys' Soccer (Winter)
- Boys' Tennis (Spring)
- Boys' Volleyball (Spring)
- Girls' & Boys' Badminton (Spring – will run if we have sufficient student interest)
- Girls' Beach Volleyball (Spring)
- Girls' & Boys' Swimming & Diving (Spring)
- Girls' & Boys' Track & Field (Spring)
- Girls' & Boys' Lacrosse (Spring — will run if we have sufficient student interest)
- Coed Golf (Spring)

#### OPTION #2: Enrollment in a Physical Education Class

Students may sign up for a Physical Education class held before or after school. These classes meet twice a week for 1–1.5 hours per session.

Physical education offerings for 2019–20: yoga, sports conditioning, general conditioning, weight training, dance, and urban hiking. Additional offerings are based on student interest.

#### OPTION #3: Outside Activity Credit

In order to be eligible for PE credit, a supervised outside activity must meet a minimum of two hours a week. An adult supervisor, other than a parent, must sign off on a student's activity. Students are required to fill out an Outside Activity form (including instructor and student signature, activity description, and participation dates) and upload to Canvas. Past examples of approved Outside Activity credit include horseback riding, rowing, club soccer, martial arts, personal training, and gymnastics. Please refer to Canvas for additional information on the PE requirement, class sign-ups, and announcements, and to access the Outside Activity form.



## Grade 9 Science of Mind



### Overview

Science of Mind is a core upper school course that continues the focus on social-emotional learning, an integral part of teaching and learning at Nueva through all grade levels. Drawing on content from a variety of disciplines and theories (mindfulness, psychology, counseling, identity development, wellness, social science, and embodiment practices), the course is grounded in scientific research on best practices. Science of Mind provides tools, skills, and information geared toward relevant issues facing adolescents and aims to develop balanced, resilient, well-rounded, compassionate people who will have a positive impact on the world.

### Goals

Students will:

- expand their capacity to understand and empathize with others
- discern the qualities of healthy relationships and how to foster these types of relationships
- learn and apply skills for stress management and emotional well-being
- be able to articulate emotional states and learn tools for emotion management and regulation
- cultivate safe spaces for themselves and classmates
- gain skills to engage in difficult conversations
- reflect upon the connection between behaviors and wellness
- learn and incorporate mindfulness skills into daily living
- deepen their understanding of mental health and mental illness
- develop personal values that inform their sense of purpose, decision-making, and engagement with the world around them
- be able to apply what they learn to life beyond Nueva

### Topics

- |   |  |
|---|--|
| <ul style="list-style-type: none"><li>• The neuroscience of stress</li><li>• Relaxation and stress management</li><li>• Community building</li><li>• Identity</li><li>• How to have challenging conversations</li><li>• Asking for help</li><li>• Sleep</li></ul> | <ul style="list-style-type: none"><li>• Mental health and mental illness</li><li>• Body image and disordered eating</li><li>• Procrastination, time management and motivation</li><li>• Sexual education</li><li>• Drug education</li><li>• Trip preparation</li></ul> |
|---|--|

### Homework & Assignments

Students will be asked to practice and apply the knowledge and skills that they learn in class to their lives.

### Assessment

Students will be assessed based on their engagement and completion of course activities. Through narratives, each student will receive individualized feedback aimed at enhancing their social and emotional development.



## Grade 10 Science of Mind/Engaged Citizenship



### Overview

Science of Mind is a core upper school course that continues the focus on social-emotional learning, an integral part of teaching and learning at Nueva throughout all grade levels. Drawing on content from a variety of disciplines and theories (mindfulness, psychology, counseling, identity development, wellness, social science), the course is grounded in scientific research on best practices. Science of Mind provides tools, skills, and information geared toward relevant issues facing adolescents and aims to develop balanced, resilient, well-rounded and compassionate people who will have a positive impact on the world. Tenth-grade Science of Mind is partnered with our Engaged Citizenship course, which enables students to critically and compassionately engage in their communities while furthering their understanding of power, inequity, diversity, and liberation. The class blends key features of social justice education and social-emotional learning in order to best prepare students for life, work, and citizenship in an increasingly diverse and global society. The class is conceived of as a “brave space,” where students learn to engage deeply with one another through dialogue, perspective-taking, listening, and trust-building. The course ultimately aims to foster students’ ability and willingness to engage with others around complex issues and with oneself in an effort to create the kind of community and 21st century democracy we all seek.

### Goals

Students will:

- learn what contributes to a brave space and work towards creating such a space for themselves and their peers
- deepen their ability to understand and empathize with others
- learn the qualities of healthy relationships and how to foster these types of relationships
- learn and apply skills for distress tolerance and stress management
- learn how to have difficult conversations
- learn and incorporate mindfulness skills into daily living
- understand what constitutes identity and how identity develops
- deepen their understanding of mental health and mental illness
- explore personal values that inform their sense of purpose, decision-making, and engagement with the world around them
- understand that a diversity of viewpoints benefits all and that dialogue and collaboration is necessary in order to be an effective learner and citizen
- deepen their capacity to engage with others on complex issues
- develop sense of agency and capacity to interrupt and change oppressive patterns and institutions within their communities and the nation
- look for transfer and application of skills beyond Nueva
- become literate in power

### Topics

- Systems of power
- Personal values
- Community engagement
- Storytelling
- Civil discourse
- The art and science of connection: the power of self-disclosure, authenticity, and vulnerability
- Cognitive distortions and biases



# Special Programs

- Mental health and mental illness
- Sexual education
- Alcohol & drug education/the science of addiction
- Stress management
- Open session

## Homework & Assignments

Homework might include reading short articles or written reflections on topics discussed in class. Students will also be asked to practice the social and emotional skills that they learn in class.

## Assessment

Students will be assessed based on their engagement and completion of course activities. Through narratives, each student will receive individualized feedback aimed at enhancing their social and emotional development.

---

---

## Grade 11 Science of Mind



### Overview

Science of Mind is a core upper school course that continues the focus on Social-Emotional Learning, an integral part of teaching and learning at Nueva throughout all grade levels. Drawing on content from a variety of disciplines and theories (mindfulness, psychology, counseling, identity development, wellness, social science and embodiment practices), the course is grounded in scientific research on best practices. Science of Mind provides tools, skills, and information geared toward relevant issues facing adolescents and aims to develop balanced, resilient, well-rounded and compassionate people who will have a positive impact on the world.

### Goals

Students will:

- expand their capacity to understand and empathize with others
- consider the qualities of healthy relationships and how to foster these types of relationships
- learn and apply skills for stress management and emotional well-being
- be able to articulate emotional states and learn tools for emotion management and regulation
- cultivate safe and caring spaces for themselves and classmates
- gain skills to engage in difficult conversations
- reflect upon the connection between behaviors and wellness
- learn and incorporate mindfulness skills into daily living
- deepen their understanding of mental health and mental illness
- develop personal values that inform their sense of purpose, decision-making, and engagement with the world around them
- be able to apply what they learn to life beyond Nueva

### Topics

- Care (for self and others); cultures of kindness
- Social psychology
- Sleep: what happens while you sleep, its benefits/value, and what happens when you aren't getting enough of it
- Sexuality, sexual health, and healthy relationships
- Processing around relationships, needs, societal norms, what makes for a healthy relationship
- Drug research projects
- Healthy decision-making



# Special Programs

- Entering the postsecondary process
- Mindfulness and tools for personal balance
- Stress management, emotion regulation, and distress tolerance
- Social justice and advocacy
- Build on past conversations regarding vulnerability and openness
- Mental health

## Homework & Assignments

Homework might include reading short articles, written reflections, watching a short video, or listening to a podcast on topics to be discussed in class. Students will also be asked to practice the social and emotional skills that they learn in class.

## Assessment

Students will be assessed based on their engagement and completion of course activities. Through narratives, each student will receive individualized feedback aimed at enhancing their social and emotional development.

---

## Grade 12 Science of Mind



### Overview

Science of Mind is a core upper school course that continues the focus on Social-Emotional Learning, an integral part of teaching and learning at Nueva throughout all grade levels. Drawing on content from a variety of disciplines and theories (mindfulness, psychology, counseling, identity development, wellness, social science), the course is grounded in scientific research on best practices. Science of Mind provides tools, skills, and information geared toward relevant issues facing adolescents and aims to develop balanced, resilient, well-rounded and compassionate people who will have a positive impact on the world.

### Goals

Students will:

- deepen their ability to understand and empathize with others
- learn the qualities of healthy relationships and how to foster these types of relationships
- learn and apply skills for distress tolerance and stress management
- better understand emotional states and learn tools for emotion management and regulation
- learn what contributes to a safe space and build safe spaces for themselves and classmates
- learn how to have difficult conversations
- understand behaviors that contribute to wellness
- learn and incorporate mindfulness skills into daily living
- understand what constitutes identity and how identity develops
- deepen their understanding of mental health and mental illness
- deepen their understanding of and learn skills for behavioral management
- develop personal values that inform their sense of purpose, decision-making, and engagement with the world around them
- look for transfer and application of skills beyond Nueva

### Content

- Exploration of strengths and goals for self, year, career, future, etc.
- Processing around the college process — conversations around personal experience and grade-wide experience; how to communicate with classmates about college acceptance/rejection, dealing with competition and comparison



- Sexual education, relationships, societal norms, and life scenarios
- Mental health and well-being
- Substances, use, and decision-making
- Technology — digital citizenship, privacy, digital footprint, and use
- Mindfulness and tools for personal balance
- Life beyond Nueva — how college/life expectations match/differ from Nueva's culture of learning

## Homework & Assignments

Homework might include reading short articles, written reflections, watching a short video, or listening to a podcast on topics to be discussed in class. Students will also be asked to practice the social and emotional skills that they learn in class.

## Assessment

Students will be assessed based on their engagement and completion of course activities. Through narratives, each student will receive individualized feedback aimed at enhancing their social and emotional development.

---

## Grade 9 Design with Impact



### Overview

Quest, design thinking, computer science and design engineering are all key aspects of the ninth-grade experience at Nueva. Design with Impact integrates these four critical curricular threads into a single course that follows students throughout the year. A key aspect of the class is to break down the perceived silos of these four topics and build the creative confidence of students to craft solutions to compelling challenges using one or all of them. Software, hardware and post-it notes can all be leveraged to address not only the challenge of launching a paper airplane across the room but also to address societal challenges around social justice and equity.

The course will move through four major arcs during the year. The first arc is preparing ninth graders for Quest by providing tips and methods for having an incredible Quest journey in their first year at the Upper School. There will be dedicated Quest classes throughout the year as needed, but class time will not be used to work on Quest.

The second arc is Designing with Hardware and Software, where we will integrate content from designing engineering and computer science. Students will gain confidence integrating lines of code, parts from 3-D printers, and servos controlled by microprocessors to tell stories through a group Rube Goldberg machine that will be shown at the Fall Culmination event.

The third arc is Designing with Others, where we will focus on leveraging the tools of design thinking to areas outside of the I-Lab with a focus on social-good projects. The students will be working in teams and taking their design thinking skills out into the broader world to help a target user group of their preference.

The fourth arc is Design Your Life, where students will have the chance to demonstrate their design thinking skills by applying all of the tools and methods gathered during the class on a final project that is codesigned with DWI faculty.

### Goals

Students should be able to:

- Leverage their Nueva design thinking skills across multiple domains, including those outside of computer science and design engineering
- Develop creative confidence in leveraging the engineering tools of the I-Lab



# Special Programs

- Appreciate and practice leveraging computer science methods to structure problems that can be solved with coding
- Work with teams in wrestling with ambiguity
- Select from multiple problem-solving and opportunity-discover strategies

## Materials

Occasionally students will be called upon to read outside of class. They will also be provided with a design notebook to help document the evolution of their design thinking skills. All other required materials will be provided on an as-needed basis.

## Homework & Assessment

While we will endeavor to keep class work inside of class time, there will be projects throughout the year that will require work outside of the scheduled class time. This might be working with teammates on their major design project during the fall semester or user-testing design thinking concepts with target users in the spring semester. As this class will meet less frequently than other courses, typically only once a week, we make every effort to keep this course from colliding with other aspects of the Nueva ninth-grade year.

Comments, questions, and ideas are welcome!

---

## Grade 10 Interdisciplinary Studies of Science



### Overview

The first semester will begin with a discussion of more abstract questions:

- What is knowledge?
- How does science progress?
- Has science been the same over time?
- How much does our language influence our thought?
- Can we, as subjective beings, be objective?
- Most importantly, why is asking these questions important for science?

Readings will include Plato, modern philosophers and historians of science, cognitive linguists, and science critiques by scientists. Themes of the first semester will include: objectivity and truth, language and metaphors in the sciences, scientific methodology, experimental design, and the influence of biases in science.

These philosophical foundations will set the stage for the second semester, where we will delve into the history of science, the intersection of science and society, and communication of science to the public. The spring semester will include “zoomed out” and “zoomed in” projects on the history of science, and a science communication project that is assigned jointly with English and inspired by a topic of interest in biology.

### Goals

The Interdisciplinary Studies of Science course in the tenth grade intends to:

- develop scientific literacy through awareness of scientific history and social, ethical, and methodological issues in the sciences
- help students connect their curriculum by building the instinct for interdisciplinary thinking
- explore issues in the history and sociology of science
- hone students’ comfort with analyzing complex primary and secondary texts from a variety of disciplines, including the sciences, history of science, philosophy, cognitive linguistics, sociology, and classics
- grow student ability to constructively discourse about such texts



# Special Programs

## Homework & Assignments

This course will primarily be a discussion seminar. This class will also contain a larger project each semester: in the first semester, a historical fiction project set around a story in the history of science; in the second semester, a presentational satire of misuses of the scientific method and an analysis of the data we gathered in tracking discussion throughout the first semester. There will also be larger interdisciplinary projects constructed collaboratively with the science, mathematics, and history classes. To this end, students' responsibilities for this course include:

- having thoroughly read the required reading(s) for each session
- posting a discussion question, revelation, or reading response to the class forum before class, as well as responding to someone else's comment
- completing all major assignments and projects
- staying intellectually engaged with the material

## Assessment

As a discussion seminar, this class's success relies on the preparedness of the students as well as their continual reflection and timely completion of assignments. Students will be assessed on the responsibilities listed above and asked to be self-reflective about their participation in class.

## Calendar

Because this course meets only once a week, students should be aware of the necessity of completing reading and prep for class ahead of time and allotting time to engage with complex readings and, rarely, longer projects.



## Electives



## Nueva Soundwaves



### Overview

Our Soundwaves elective is an auditioned choral ensemble for experienced singers who want to take their music-making to the next level. Any interested student should contact Cathy to arrange for an audition.

This ensemble will explore advanced choral and vocal technique and music theory through an accompanied and *a cappella* mix of choral repertoire, including classical, pop, jazz, and/or musical theater repertoire. Students will perform in groups and as solo artists.

While rehearsing a variety of music, students will refine their individual and ensemble singing skills and develop a repertoire of songs from multiple genres to perform in school and the community.

### Homework

Most of our work in this elective will occur during class time. Students will be assigned various theory, sight-reading, and other listening reflections throughout the semester. Additionally, students will be responsible for learning their individual parts outside of our weekly rehearsals.

### Assessment

Students will be primarily assessed through positive participation during class time, their willingness to practice between classes, and their growth throughout the course. Additionally, students will be assigned one or two solo or small-group numbers to analyze and perform. Projects will be assessed with a rubric, self-evaluations, and narrative.

---

## Jazz Ensemble



### Overview

Jazz Ensemble will study and perform various jazz stylings, including blues, swing, Latin, Brazilian, and calypso. Each style will be explored historically, theoretically, and in performance. Emphasis will be on the basic concepts of each style as well as improvisation. Students will be exposed to “standards,” the classic compositions that are an integral part of any jazz musician’s vocabulary.

In addition to performing at the upper school arts culmination on Thursday evening, December 13, we will look for other opportunities to perform at open houses and informal lunch concerts and morning meetings. Grading will be based on attendance and participation in class.

### Goals

The Jazz Ensemble is designed to increase a student's musical proficiency, rhythmic vocabulary, ability to improvise, knowledge of theory, and understanding of that uniquely American art form — jazz. We will use a variety of rehearsal methods intended to strengthen and expand both conceptual and practical knowledge, and to help students improve their ability to hear intervals, melody, chords, and rhythms. For example, we will learn jazz standards, modern jazz compositions, and musical forms directly related to jazz, like the Brazilian samba and Latin jazz.

### Homework

Most of our work in this elective occurs during class time. When we begin a more challenging piece of music, I will ask students to spend some time learning the music at home so we can use the class time learning the song as a whole, rather than teaching students individual parts.



## Assessment

Primarily, students are assessed through their positive participation during class time and their willingness to practice and work on music and improvisation between classes. Additionally, students will be assessed on their willingness to learn the language of improvisation, which includes the study of chord/scale relationships, and how improvising musicians apply those concepts in an ensemble and performance setting.

---

---

## Nueva Steel Drum Band



### Overview

In the fall semester, the steel band will focus on learning compositions by Trinidadian steel drum virtuoso Robert Greenidge. Robert is one of the world's most influential steel drum composers, and while he has been known worldwide as a part of Jimmy Buffet's Coral Reefer band for the past 30 years, he is also a panorama winner in Trinidad's Carnival, arranging for the 120-member Desperadoes Steel Orchestra. Robert's compositions are beautiful yet technically demanding with intricate strumming rhythms, which will require much attention in rehearsals.

The band will learn a number of pieces to culminate in a "Caribbean Night at Nueva," a concert performance with Robert Greenidge in the GCC on December 1 at 7:00 pm. Joining Robert and the Nueva steel bands will be former Santana lead vocalist, 11-time Grammy winner Tony Lindsay.

In addition to learning the calypso stylings of Robert's music, we will most likely do several Santana tunes as well as music by Sting and Bill Withers. The rhythms of each style present different challenges for each section of the band.

### Goals

The goal of the class is to develop an advanced steel drum ensemble for the high school that will play complex arrangements in a variety of musical styles. The ensemble will perform at school and in the community throughout the year. We will also perform at the upper school arts culmination in early December.

This class is open to students who have had previous experience playing steel drums, either at Nueva or elsewhere.

### Homework

In addition to the performance aspect, we will research the history of the instrument, its cultural significance, its pioneers, and its greatest composers and performers. Students will do individual research projects on the development of the modern steel band and its musical styles, as well as listening to a variety of music related to the instrument.

### Assessment

Students will be assessed primarily on their positive participation in rehearsals, willingness to practice parts individually between classes, attendance, and participation in the concert. In addition, students will be evaluated on their willingness to listen to the different genres of music played and to strengthen their music theory skills.



### Music Design and Production



#### Overview

Students will learn how to create any type of music that they can dream of, using imagination and the program Ableton Live. Students will learn the fundamental concepts of music production, covering everything from programming electronic compositions using MIDI to recording live instruments and vocals to designing, engineering, and automating their own sounds. Students use musical examples from the industry to understand certain concepts in digital production and learn how to design and produce music using their own sounds and patches. Course assignments include creating musical compositions or designing sounds and patches for future productions using Ableton and are flexible in regard to genre and style (electronic vs. live). The course will model a workshop environment, as we will listen to and discuss student projects as a group. At the end of the course, students produce a final original song at full length.

### Groove Workshop



#### Overview

Groove Workshop is a music performance workshop designed to teach students how to form and maintain a band — in other words, how to rock! Areas covered will include analysis of song form and structure, rehearsal methods, chart writing, equipment setup, and performance tips and tricks. A big part of being in a successful band is having the ability to communicate and be open to the ideas of others. Making music is a great way to create bonds and build teamwork. This class gives students that opportunity.

#### Goals

The goals of the elective will be to master the songs we choose to learn, develop proficiency as musicians through playing challenging music, learn to play well as a band, and perform both at Nueva and in the community.

#### Homework

Most of our work in this elective occurs during class time. When we begin a more challenging piece of music, I will ask students to spend some time learning the music at home so we can use the class time learning the song as a whole, rather than teaching students individual parts.

#### Assessment

Primarily, students are assessed through their positive participation during class time and their willingness to practice and work on music. As this is considered an advanced group, students are expected to be proficient at all their individual parts for each song we learn.

### Drawing 1



#### Overview

Drawing considers our perception, observation, and knowing of the world around us. It is a method of recording and expression in a visual language all its own. This studio course focuses on technical skill as well as mark-



making as a form of creative exploration. Students will examine their interests and ideas through visual representation, working both technically and intuitively. Though class time will include lessons and discussions, students will typically be working on projects using a variety of drawing media, including (but not limited to) graphite, charcoal, and colored pencil. Studio time encourages a quiet focus and provides the necessary hours to build and refine the connection between the hand and eye. We will explore historically significant and contemporary artists, along with concepts in visual and critical studies. Students are strongly encouraged to participate in a culminating art show at the end of the semester.

## Goals

- Art provides a powerful and essential means of communication through unique symbol systems and metaphors that convey and inform life experiences
- Generating/problem-solving: Can demonstrate creativity and originality with many ideas, experimentation, connecting to previous knowledge, creative problem-solving
- New ways of seeing: Art provides a framework for viewing the world
- Visual creation as creative self-realization
- Understanding the elements and principles of design provides the tools for visual expression
- The arts as culture, history, and connectors

## Homework

This course will have at least one short reading and sketchbook assignments, and will require studio time outside of class to finish projects.

## Assessment

Assessment is based on the student's enthusiasm, willingness, and initiative in engaging with the subject. There is also a strong emphasis on innovation, respect for materials, and utilization of skills covered. Students are expected to complete all assignments, which will include but not be limited to:

- blind contour drawing
- monochromatic still-life
- charcoal still-life
- group drawing project
- literal and nonliteral self-portrait

---

## Printmaking 1



### Overview

Printmaking is a process-based class that uses layers of ink to create an artwork. This studio course focuses on technical skill as well as printmaking as a form of creative expression. The class will cover a survey of techniques including relief, intaglio, and etching. Throughout the semester, students will make monoprints and produce projects in multiple. Students will examine their interests and ideas through visual representation, working both technically and intuitively. Though class time will include lessons, demonstrations, and discussions, students will typically be working on projects in the studio or using the etching press. Studio time encourages a quiet focus and provides the necessary hours to build and refine the connection between the hand and eye. We will explore historically significant and contemporary artists, along with concepts in visual and critical studies. Students are strongly encouraged to participate in a culminating art show at the end of the semester.

## Goals

- Visual literacy — art provides a powerful and essential means of communication through unique symbol systems and metaphors that convey and inform life experiences



- Generating/problem-solving — can demonstrate creativity and originality with many ideas, experimentation, connecting to previous knowledge, creative problem-solving
- New ways of seeing — art provides a framework for viewing the world
- Visual creation as creative self-realization
- Understanding the elements and principles of design provides the tools for visual expression
- The arts as culture, history, and connectors

## Homework

This course will have short readings and sketchbook assignments, and it will require studio time outside of class to finish projects.

## Assessment

Assessment is based on the student's enthusiasm, willingness, and initiative in engaging with the subject. There is also a strong emphasis on innovation, respect for materials, and utilization of skills covered. Students are expected to complete all assignments, which will include but not be limited to:

- Designing and creating three final projects
- Designing and creating projects in multiples
- Designing and creating monoprints
- Keeping a sketchbook with notes and project plans

---

## Advanced Studio Art



### Overview

Advanced Studio Art is a class for students who want to continue making art and are interested in building a portfolio. Students in this upper division class will have taken an art class before and will drive their own exploration and art making. Students will have the opportunity to work in a community of other students who are committed to making and discussing art. Over the course of the semester, students will choose artistic research interests and make work based in those interests. This studio class will be focused on critique of student work in addition to making work; discussions and readings will provide a frame for the critiques. An emphasis will also be placed on larger portfolio goals, and students will work toward achieving a cohesive portfolio with depth in addition to breadth. Students will work across mediums, according to their interest and portfolio needs. Advanced Studio Art students will be expected to participate in the arts culmination at the end of the semester.

### Goals

- Art provides a powerful and essential means of communication through unique symbol systems and metaphors that convey and inform life experiences
- Generating/problem-solving — can demonstrate creativity and originality with many ideas, experimentation, connecting to previous knowledge, creative problem-solving
- New ways of seeing — art provides a framework for viewing the world
- Visual creation as creative self-realization
- Understanding the elements and principles of design provides the tools for visual expression
- Guidance in creating an art portfolio

## Homework

This course will require studio time outside of class to finish projects.



## Assessment

Assessment is based on the student's enthusiasm, willingness, and initiative in engaging with the subject. There is also an emphasis on innovation, respect for materials, and utilization of skills covered. Students are expected to complete all assignments, which will include but not be limited to:

- Four or five finished pieces by the end of the semester
- Engagement in critique
- Keeping a sketchbook with notes and project plans

---

## Art and Fabrication 1



### Overview

This semester-long course combines the fields of visual art and fabrication. Students in this course work in a variety of media to create projects that demonstrate understanding and consideration of craftsmanship and the elements and principles of visual art. These elements and principles include, but are not limited to, space, form, balance, light, and contrast. Students gain firsthand knowledge and experience with construction by using a variety of hand tools, power tools, and materials, such as the hand drill, chop saw, band saw, belt and orbital sanders, wire, foam, wood, and sheet metal. Emphasis is placed on appropriate use of tools and safety. Students create work that can range from representational to abstract; it might be inspired by historical or contemporary artists and art movements. Through readings, slide presentations, and visiting artists, students consider the context in which they are creating art. Throughout their process, creative problem-solving and intentional decision-making will play a significant role in their ability to consider their ideas through visual means. Students participate in critiques as a means to develop critical thinking skills and to further understand the meaning in their work.

### Goals

Some students who take this course have more experience with artistic expression than with mechanical fabrication. This course aims to empower these students by giving them the fundamental shop skills they need to create physical objects beyond those that are possible using pens, pencils, paints, and traditional sculptural media. By gaining competence and confidence in the use of hand and power tools, these artists will be transformed into maker-artists, capable of constructing robust, 3-D art from their already formidable imaginations.

Some students enrolled in Art and Fabrication 1, on the other hand, are more talented in the areas of engineering and power tool usage than in generating, developing, and realizing artistic visions. This course aims to empower these students by introducing them to artistic and creative processes and by giving them ample opportunity to practice visual creation. Just as understanding proper, safe usage of shop spaces provides the tools for physical creation, so will understanding the elements and principles of design provide the tools for visual expression.

All students, regardless of former capabilities, will grow their knowledge of and skills in both art *and* fabrication by the application of each in the context of the other.

### Homework & Assignments

This course will have at least one short reading, several small assignments, and will require studio time outside of class to finish projects.

### Assessment

Assessment is based on the student's enthusiasm, willingness, and initiative in engaging with the subject. There is also a strong emphasis on innovation, respect for tools and materials (including cleanup), and utilization of



skills covered, both in art and fabrication. Students are expected to complete at least three assignments, including but not limited to:

- biomorphic chair project
- cube sculpture
- final project

Further assessment will be based on students' self-reflection.

---

## Introduction to Sculpture: Ceramics and Clay



### Overview

This is a studio class that explores ways of thinking three-dimensionally, with clay as the primary medium. It serves the needs of beginners and experienced students of art. In addition to sculpture techniques, the elements of the three-dimensional art and design will be studied as they apply to the projects at hand. Students work in both subtractive and additive manners, incorporating basic aesthetic concepts such as line, texture, composition, balance, mass, space, rhythm, tension, movement, light, and density. Students explore the relationship between form and content in materials through hand-building techniques in clay. Projects investigate representation (people and things), abstraction, and architecturally inspired design/installation. Students are encouraged to think about the conceptual possibilities of sculpture and expressing a personal point of view.

Students participate in a culminating upper school gallery showing, presentations, and critiques. Homework includes some reading, writing, and sketchbook assignments.

### Goals for the Discipline (Enduring Understanding)

- Art as communication: In today's society, the arts are the media and provide powerful, essential means of communication — unique symbol systems and metaphors that convey and inform life experiences
- Art as perception: Processing, analyzing, and responding to sensory information through the language and skills unique to the visual arts
- Generating and solving problems: Demonstrating creativity and originality through many ideas, experimentation, making connections to previous knowledge, creative problem-solving
- Aesthetic valuing: Students analyze, assess, and derive meaning from works of art, including their own, according to the elements of art, the principles of design, and aesthetic qualities
- New ways of seeing: Art provides a framework for viewing the world
- Visual creation as creative self-realization
- Understanding how the elements and principles of design provide the tools for visual expression
- The arts as culture, history, and connector

### Learning Outcomes (Skills)

- Understand and demonstrate the idea of "transformation" of materials to create/and or change meaning
- Demonstrate three-dimensional thinking and production through clay sculpture processes (practice)
- Work in additive and subtractive methods (practice)
- Explore, practice, and experiment with clay bodies, tools, and glazes
- Learn about different clay bodies, stages of dryness, storage and reclaiming, clay preparation, safety procedures in the studio
- Demonstrate understanding and incorporate elements and principles of art
- Develop the skills needed in the sculptural process, such as form, structure, volume, visual balance, surface treatment, composition, movement, and scale



- Develop conceptual intent, aesthetics, and technical skills in order to achieve and expand the sculptural objective
- Explore the relationship between form and content, express a personal point of view, and consider the conceptual possibilities of sculpture
- Engage others through the presentation and dialogue of their work

## Projects

- Textured pinch pot
- Double pinch pot animals (students who have previous clay experience will design an animal with an element of surprise)
- Slab wall relief sculpture (texture inspired from nature)
- Slab lantern (inspired by architecture)
- Coiled sculpture (abstract/organic, figurative)

---

## Painting 1



### Overview

Painting is a studio class that teaches students about working with paint and exploring a range of applications. The course covers color, light, space, and the handling of paint (gouache and acrylic) in addition to exploring the beauty of forms and color. Students will be painting people, places, and things while simultaneously exploring ideas about abstraction, representation, and expression. Students are encouraged to reflect on their own lives, experiences, interests, and hobbies as inspiration for their work while building their painting skills. Aside from studio work, there will be critiques, sketchbook homework, some reading, and writing. The ultimate goal is for each student to develop an individual visual vocabulary and to transform an assignment into a quest that demonstrates curiosity, commitment, and craft.

### Goals

Painting 1 is an introductory course covering the basic principles and techniques of the painting process. This course is designed as a one-semester studio practice and will be primarily based in the use of acrylic paint and gouache. Beginning painting fundamentals to be explored include: value, color theory, mixing paints, and mediums. Each assignment will introduce students to the elements and principles of design to help build their artistic vocabulary and understanding. The instructor will help each student engage strategies for conceptual development by working through individual painting problems and emphasizing personal meaning and relevance to contemporary culture.

### Goals for the Discipline (Enduring Understanding)

- Art as communication: In today's society, the arts are the media and provide powerful, essential means of communication — unique symbol systems and metaphors that convey and inform life experiences
- Art as perception: Processing, analyzing, and responding to sensory information through the language and skills unique to the visual arts
- Generating and solving problems: Demonstrating creativity and originality through many ideas, experimentation, making connections to previous knowledge, creative problem-solving
- Aesthetic valuing: Students analyze, assess, and derive meaning from works of art, including their own, according to the elements of art, the principles of design, and aesthetic qualities
- New ways of seeing: Art provides a framework for viewing the world
- Visual creation as creative self-realization
- Understanding how the elements and principles of design provide the tools for visual expression



- The arts as culture, history, and connector

## Projects

- Monochromatic painting
- Painting from life (light & shadow study)
- Limited palette portrait

## Homework

Homework includes occasional readings, sketchbook assignments, and research for projects.

## Assessment

Assessment is based on a willingness to engage with the subject. There is a strong emphasis on craftsmanship, innovation, effort, perseverance, respect for materials, and utilization of skills covered. Students are expected to complete all projects and participate in critiques. In addition, all students are required to participate in the Arts Culmination at the end of the semester.

---

## Fall Production



### Goals

In this semester-long course, our primary goal and process will be the creation, from scratch, of a full-length production, including table work, blocking, and rehearsing off-book. This work will culminate in three public performances (November 7, 8, and 9). Through a detailed exploration of this play in particular and theatrical craft in general, students will hone their skills across numerous theatrical realms, collaborating under the guidance of the teacher/director to create an experience that is so much more than just the presentation of a script. As our ensemble works together, students will grow as artists, creators, improvisers, analysts, thinkers, teammates, and empathizers.

### Overview

This year's play is *Harvey*, Mary Chase's 1944 exploration of sanity, family, and shared humanity that won the Pulitzer Prize in 1945 and still ranks as one of the longest-running plays on Broadway. This classic, employing elements of farce without losing its sense of deep meaning, takes its silent and invisible title character and leverages him to leave audiences thinking about how they live their lives, and how they should live them. As we build our ensemble and craft our production, students are encouraged to contribute in ways beyond just acting — there will be opportunities available during the rehearsal and production process for people of diverse talents and interests. We will begin our exploration of the play with academic and dramaturgical work, transitioning to the creative processes of interpretation, blocking, and performance as we ready to present the play to the wider community. Our group will continue to meet during class time in the weeks following performances, allowing students to discuss the production and to delve deeper into the text, the style or world of the play, and alternate representations of the play. We will start our analysis by meeting as a mini "book club" to explore contemporary plays that confront themes similar to *Harvey*'s, and we will finish the semester strong with personal presentations and scene work devised, directed, and designed by the students.

### Homework & Assessment

Homework in the first half of the semester will consist primarily of memorizing lines and blocking, as well as helping to create designs that we will use in the various aspects of our show. In the second half of the semester, the homework will be light (to reflect the front-weighting of our semester building up to opening night) and largely project-based.

Students will be assessed using a standards-based template that draws together skills across the theatrical spectrum. Given the creative nature of this class, there will be no bound assessments in the form of tests or



quizzes; rather, students will be constantly growing and receiving feedback from the teachers and each other. Students are encouraged to view our performances not as a moment of assessment but instead as an important step in the process of artistic development.

## Rehearsals & Materials

Rehearsals will be held during class time, with occasional after-school sessions and a few weekend rehearsals in advance of the show, culminating in an immersive “Tech Week” period running from October 29 to November 6, during which rehearsals will occur every evening. Performances will be November 7, 8, and 9, and attendance for all performances and technical rehearsals is mandatory. Students are expected to arrive at all rehearsals (and classes) prepared with their script and anything else that they need to present for that day, as well as proper writing utensils with which to take notes. We will mostly not be using laptops or cell phones in class, although students might find such tools helpful for the design work that they do outside of class.

---

## Cinema Studies



### Overview

Not to be confused with a class where students would focus on making movies, this course is about *studying* movies. With an eye towards cinema appreciation, criticism, and analysis, this class focuses on the art of understanding and “reading” film. We will spend time watching and analyzing portions of nearly 100 films (and some in their entirety). On occasion, there will be an opportunity to experiment with media creation as well, and students will create projects that utilize various cinematic techniques that we discuss together in class. Texts include short weekly readings and chapters from various filmmakers, theorists, critics, and academics, as well as the films that we will engage.

### Goals

Students will explore the following enduring understandings:

- Films tell stories by employing a variety of techniques in all stages of their process: pre-production, production, and post-production.
- Films are products of historical dynamics that continue to resonate as they reach new audiences over the course of time.
- An understanding of cinematic craft allows for a deeper understanding of each film’s narrative impact as well as a greater appreciation of films.

### Homework & Assessment

We will begin the semester with an overview of cinematic history and then move into watching films for the purpose of understanding specific cinematic techniques and narrative styles. Students will be responsible for completing readings and watching selections from films outside of class time as homework. Additionally, students will complete smaller assignments and projects (some during class, some on their own time) to demonstrate their understanding of course content. For example, students will complete a brief presentation as they explore an aspect of film history, will analyze a shot as they begin to consider elements of mise-en-scène, will compose a short media project to experiment with editing techniques, and more. Additionally, students will craft two film reviews and a short film analysis, and will demonstrate their learning from the semester in a self-designed final project.



## Journalism



### Overview

In this yearlong course, students will read and write a range of newspaper writing styles, including news, feature, opinion-editorial, sports, and entertainment. We will learn to write for different audiences and purposes, practice revision, and create compelling and meaningful stories that meet standards of accuracy, grammar, style, and journalism ethics. This is a writing and newspaper production course that explores a variety of storytelling techniques, emphasizes the importance of research and interviewing, and teaches layout and editorial design.

Students will work independently and in small groups on all stages of newspaper production to publish the student newspaper. Like all journalists, students will work in a fast-paced environment where meeting deadlines is a priority and keen attention to detail is required. This class will emphasize both collaboration and student leadership; editorial responsibilities are given to students who demonstrate exemplary expertise, commitment, and leadership. Students are expected to spend additional time outside of class in the production of the newspaper.

Through participation in this course students will become members of both the Columbia Scholastic Press Association and the National Scholastic Press Association. These national organizations for student journalists hold yearly conventions and publications competitions. Students will be encouraged to submit their work for critique and judging to each organization's yearly contests, and a delegation of Nueva students will attend the NSPA spring journalism convention in San Francisco.

### Goals

We will work collaboratively across a range of journalistic media in order to cover events and topics that are interesting, thought-provoking, and impactful.

### Materials

Students will produce the yearbook in Adobe Creative Suite on school-provided laptops. The instructor will provide additional materials and supplemental readings. Foundational texts include *Telling True Stories* edited by Mark Kramer and Wendy Call and *Writing & Reporting for the Media (11th edition)*.

### Homework

All students will write stories and then plan and design the page layout for framing their work. Writing and reading assignments will be assigned as homework, and most design and revision work will be completed during class hours.

### Assessment

Students will receive ongoing verbal and written feedback on their developing skills. For writing assignments, students will be given a rubric along with comments from the instructor. Students will also be assessed based on their engagement in class activities, their effort to work collaboratively and productively, the timely delivery of scheduled content by set deadlines, and their commitment to producing the best work of which they are capable.



## Yearbook



### Overview

This yearlong course produces Nueva's annual yearbook. Yearbook offers students an exciting opportunity to further their creative interests in writing, design, and photography while acquiring highly transferable skills in journalism, print production, and visual storytelling. Skills covered include digital design (specifically layout, theme development, and the use of Adobe InDesign), journalistic writing (features, captions, and interviews), and digital photography (composition, shutter rate, depth of field, and Adobe Photoshop). This class will emphasize both collaboration and student leadership, and students are expected to invest fully in the course by meeting all deadlines and actively participating in class and all work sessions. Students are expected to complete assignments on deadline, to fulfill their duties as staff or editors, and to contribute to the overall advancement of the yearbook theme and content.

Through participation in this course students will become members of both the Columbia Scholastic Press Association and the National Scholastic Press Association. These national organizations for student journalists hold yearly conventions and publications competitions. Students will be encouraged to submit their work for critique and judging to each organization's yearly contests, and a delegation of Nueva students will attend the NSPA spring journalism convention in Los Angeles. This class will also include a visit to a Bay Area publishing house where students can meet and learn from publishing professionals at work in the real world.

### Goals

We will work collaboratively across a range of journalistic media in order to convey the narrative of the 2018–2019 school year in an inventive, compelling book emblematic of the Nueva experience.

### Materials

Students will produce the yearbook in Adobe Creative Suite on school-provided laptops. The instructor will provide additional materials and supplemental readings. Students are requested to procure a digital SLR camera that they should keep in their locker.

### Homework

At the beginning of the year students will work on presentations as they investigate the role of design, photography, and written content in outstanding publications. As the year progresses all students will write copy, design spreads, and take photos for the yearbook. Students will shoot afterschool events, but most work on the yearbook will be completed during class hours.

### Assessment

Students will be assessed based on their engagement in class activities, their effort to work collaboratively and productively, the timely delivery of scheduled content by yearbook deadlines, and their commitment to producing the best work of which they are capable.

---

## California History by Foot, Hoof, and Rail



### Description

We will be exploring California history by studying precontact Indian cultures, tracing waves of westward immigration through the Sierras, and looking at the impact of railroads, agribusiness, water politics, mid-twentieth century economic developments, and the technological revolution that has reshaped the state. Our course will have a decidedly interdisciplinary approach, as we will examine the works of authors (such as John



Muir and Rachel Carson) and various film producers (to understand major issues through the director's lens). Students will study issues of significance in the development of California as well as subjects born from their own interests, and they will participate in teaching their classmates in seminar-style sessions. There may be class field trips, and interested students may explore the Sierras by horseback and/or backpacking accompanied by the instructor, as opportunities allow.

---

### Capitalism and the Apocalypse: Realism and Utopianism in the History of American Capitalism



#### Overview

Around the time of the 2008 economic crisis, there was a saying among many humanists that made its way into popular cultural discourse: "It is easier to imagine the end of the world than it is to imagine the end of capitalism." And this was said at a time when people were seriously questioning whether the values and motivations intrinsic to the political economy of capitalism had produced the crisis. Simultaneously, there was a boom in films in which the end of the world was envisioned in various forms of social, political, or environmental catastrophe. This class provides an opportunity for students to conduct original research around moments of transition in American capitalism, examining efforts to define capitalist reality or imagine alternatives to the status quo.

#### Goals

The main focus of the class will be independent, original research projects. The class will employ a variety of methodologies and readings from history, literature, and media students to think about representations of capitalism in specific historical moments stretching from the antebellum era to the present. Students will also be introduced to a variety of scholarly research and critical literature that has developed in response to these moments, each of which make the case for the importance of cultural representation in thinking through our social and economic values. Our end goal is to produce a scholarly work that incorporates original research into a piece of scholarly research that could be shared with a larger academic community.

#### Homework and Assessment

Course work is organized to provide scaffolding as students complete the primary research project. The course is divided into three parts: a reading and historiography section, research, and writing. Students will be expected to construct bibliographies and research plans, conduct primary source research, submit sample paragraphs and outlines, and complete multiple drafts of their primary paper.

#### Material

The course begins with a general reading packet of primary and secondary source material to introduce students to the field. This will be followed by more focused readings based in student interest.

---

### Postcolonial Latin America



#### Overview

Although Latin America is united by a common history of European colonialism, there is no single narrative of Latin American history. Rather, this course will use specific case studies to develop a historical, nuanced and multifaceted view of Latin America. Students will explore issues of sovereignty, the strong hold of dictatorships,



underground insurgencies and counter-revolutions, U.S. intervention, neoliberalism, and shifting cultural and racial identities. In doing so, we will answer questions such as what makes movements revolutionary and why do people join or resist their call to action? How do we as historians assess their lasting impact? This course will utilize an interdisciplinary approach drawing on an array of materials including film, correspondence, photographs, music, and scholarly texts.

## Goals

- Expand knowledge and understanding of political, economic, and social movements throughout Latin American histories
- Develop the ability to interpret and synthesize multiple types of evidence, including historical documents, literary texts, and interdisciplinary sources
- Ask historical questions and create arguments with historical complexity, incorporating multiple perspectives
- Analyze contemporary events within greater theoretical and historical frameworks
- Collaborate, present, and discuss work within a cohort of peers

## Homework & Assessment

The class includes regular reading assignments with occasional in-class reading responses. Students will use the assigned readings to participate in group activities and student-led discussions. Larger assignments will require students to interpret evidence, including both primary and secondary sources, as well as formulate and defend interpretations. Major projects will include a testimonial literature analysis, revolution simulation, and individual research project. This final paper, which will be the semester's culminating piece, will include smaller assignments such as a prospectus, outline, and first draft, as well as peer reviews.

## Materials & Resources

Materials include texts and course readings, all of which will be available electronically on Canvas. Students are expected to print the readings for homework and bring a hard copy to class. They will use notebooks as well their Nueva laptops in class.

For reading material, this class draws widely from several different main texts, including *Born in Blood & Fire: A Concise History of Latin America*, by John Charles Chasteen (Norton & Company, 2016), and *Modern Latin America*, by Thomas E. Skidmore (Oxford University Press, 2014). Additionally, a wide array of primary and secondary sources will provide greater depth and focus.

---

---

## Speech and Debate



### Overview

The course introduces four competitive speech and debate events: Extemporaneous Speaking, Impromptu Speaking, Parliamentary Debate, and Public Forum Debate. Students then choose one speech and one debate event in which they specialize. Public forum debaters will research and write cases on bimonthly and monthly topics issued by the National Speech and Debate Association; parliamentary debaters and extemporaneous speakers will read widely on current events. All students will compete in at least one interscholastic tournament each semester (though many more are offered).

## Goals

- Increase comfort level with prepared and impromptu public speaking
- Expand research skills
- Foster ability to see all sides and main aspects of public policy issues
- Build teamwork in research and performance



## Materials

The wide world of online and library research; also *Beyond Resolved: A Public Forum Debate Manual*, by Ashley Artmann.

## Homework

Public forum homework consists mostly of research and case writing on the current topics (generated monthly or bimonthly by the National Speech and Debate Association). Parliamentary debaters will write (and rewrite) briefs on a wide variety of current affairs topics. Advanced debaters act as mentors.

## Assessment

Class participation; case writing and research evaluation; ambient and focused assessments of oral performance in practice and competition (NOT related to wins and losses!). Key skills: the ability to analyze a debate topic; the ability to find useful resources that support arguments on those topics; the ability to create well-organized, evidence-based presentations; adaptation to and communication with the judge.

---

## Introduction to Entrepreneurship



### Overview

Do you have an idea on how to change the world? Do you find success in dollar signs or smiley faces? This class is for you! We'll walk through the basics of entrepreneurship, looking across aspects of starting, operating, and scaling a business. A mix of guest lectures from thought leaders, business content with exercises, and student-driven projects will bring students through the basic building blocks of a successful enterprise. The second part of the course will focus students on refining a business concept of their own design, either a social venture that measures their impact through lives changed or a traditional start-up that looks to grow a market for their concept. Open to all students — no prerequisites.

### Goals

Students should be able to:

- Conceptualize and evolve an opportunity that establishes and sustains product-market fit
- Leverage the business model canvas to design and evaluate the required elements of their business
- Select and monitor key metrics critical to the growth and success of their business, including metrics from accounting, operations and product development
- Prototype different aspects of the business with agility
- Demonstrate an understanding of how to assess and build demand for their offering
- Demonstrate comprehension of resource requirements to build, grow, and sustain their enterprise.
- Embrace the ambiguity of entrepreneurship
- Demonstrate growing prowess in the ability to communicate the complexities of their enterprise
- Seek out and nurture collaboration with others vital to the success of their enterprise

### Materials

Key materials include texts and course readings, many of which will be available electronically. Students will use notebooks as well their Nueva laptops in class. Additionally, students will be called upon to craft and test prototypes of their business concept. The course will provide a small budget for materials for each student. Students should work to stay within that budget.

### Homework & Assessment

Assessment in this class is based on students demonstrating their skill in understanding the material and using those materials to evolve a venture. There is no expectation that a new company will be launched — more that students will have experience with the various building blocks of a new enterprise and insights from the analysis



of many successful and failed ventures. The primary assessment vehicle will be their team venture, in which class assignments will be used to flesh out aspects of the enterprise. These class assignments will be graded based on how fully students explored the use of the tools and methodology, not whether the venture would be successful (who knows at this early stage?!). Ideally, students finish the class with a better understanding of the risk-management behavior of entrepreneurs and an excitement to try their own hand at entrepreneurship in the future.

---

## Introduction to Mechanical Engineering



### Overview

This course will dig into the details of basic mechanisms and power generation. You will use gears, pulleys, linkages, and other tools to design and build thingamajigs and whirlygigs of your own design. A mix of hands-on dissection of existing mechanisms, like clocks and walking toys, and micromodules on the engineering behind these components. The course could include class-designed Rube Goldberg machines, the design of a personal mechanism project, or the crafting of our own steampunk "prototypes" from the future past. By the end of the course, you'll have a deeper understanding of the mechanisms that still make our world work, including how to size power generation devices like motors to make your machines come alive. Open to students who have completed a year of high school physics.

### Goals

Students should be able to:

- Demonstrate the ability to analyze a mechanical system, using a mix of core physics and basic mechanical engineering principles
- Synthesize new mechanical systems based on an understanding of the design requirements and available components
- Prototype and refine mechanical systems using the materials and tools on hand
- Show an understanding how of mechanical systems can be controlled using active control elements such as electric motors or servos
- Plan and execute long-term design projects, including concept development, material sourcing, prototyping, and manufacturing

### Materials

Key materials include texts and course readings, many of which will be available electronically. Students will use notebooks as well their Nueva laptops in class. Students will be asked to build various mechanical prototypes of the concepts covered in class as well as complete a few design projects. Materials for these projects will be provided by the I-Lab.

### Homework & Assessment

This class will have a mix of project assignments and occasional analytical homework assignments that will allow students to apply principles discussed in class to real-world engineering problems. There will be two or three major projects, done in teams, where students will design, analyze, and then prototype a complex mechanical system to accomplish a given task. Time outside of class will be mainly focused on the design and construction of these system using the I-Lab.



## Environmental Economics



### Overview

Climate change has forced governments across the world to consider new and creative ways of regulating the environment. Our course will consider the economic underpinnings of emissions trading, carbon taxes, command and control programs, fishery management, and many other environmental policies. In order to experience the effects of emission policies first-hand, students will compete against each other in an “Electricity Strategy Game” that will simulate the effects of emissions policies on electric utilities. We will investigate the political economy of environmental policy, looking into why strong environmental policy is rare and discovering ways to make regulations more financially palatable. Our class will also gain insight into the challenges of forming binding international climate agreements by applying game theory bargaining models to contemporary climate change agreements such as the Kyoto Protocol and the Paris climate change agreement. We will dive deeply into the many models of emissions-trading programs by considering carbon offset programs, price floors, grandfathering, and the effects of California’s sulfur dioxide cap-and-trade program. The course will be structured around the tools and models of microeconomics, utilizing graphical analyses, critical thinking skills, and a survey of contemporary research.

### Goals

This course will provide budding economists an opportunity to apply their microeconomic knowledge to challenging environmental issues. Students will learn to:

- quantify the global value of environmental resources for current and future generations through discounting and risk analysis
- discern optimal levels of natural resource protection and pollution abatement based on projections of marginal cost, surplus, and efficiency
- evaluate the effects of differing environmental policies by considering firm behavior, industrial organization, and price elasticity
- analyze international climate agreements, using game-theoretical concepts
- identify environmental and economic issues for future research

### Homework & Assessment

All students are expected to complete assigned readings and relevant questions in preparation for class discussions. Problem sets will be assigned for each unit. These will be completed individually and reviewed in groups in class. Students will be assessed on their ability to demonstrate graphically, analytically, and verbally that they understand applications of the core concepts of the course. During the last month of the semester students will participate in the Electricity Strategy Game in which they will develop complex strategies based upon the modeling approaches they have learned throughout the semester. They will be evaluated on their success, capacity to work well within a team, and accurate usage of economic data to forecast the effects of their decisions.

### Materials

Our course will survey important academic papers within the environmental economic community, such as the *Stern Review on the Economics of Climate Change* and the critique of this review advanced by William Nordhaus. As an example of advanced economic modeling of climate change we will examine Christian Traeger’s integrated climate assessment model.



---

## Microeconomics



### Goals

Our course will introduce students to the core questions, models, and tenets of microeconomics. Together, we will analyze the economic rationale and consequences of choices made by consumers, businesses and government within the context of our broader economic system. Our goals for the class are as follows:

- understand consumer behavior, noncooperative game theory, and the limits of economic rationality
- predict and understand firm behavior in terms of price, quantity, market entry, and efficiency
- analyze a variety of market structures including competitive markets, monopolies, and oligopolies
- explore the causes and effects of market failures
- understand the effects of government policies on market outcomes including consumer and producer surplus
- build a strong analytic foundation that will enable successful future forays into the world of economics

### Overview & Assessment

Through academic texts, news articles, case studies, and in-class simulations, we will expand our understanding of why economic decisions are made and how to predict and evaluate their far-reaching consequences. Given that the field has been practically reinvented by behavior economists over the past several decades, we will turn a very critical eye to the neoclassical economic view of the world while simultaneously learning of its inner workings. Students will be assessed through a series of problem sets, two written tests, and one market-failures project in which they will be creating economic games in small groups. Day to day, classes will comprise discussions, economic games, and lectures.

### Materials

The primary text for this course is *Microeconomics 3rd Edition* by Paul Krugman and Robin Wells. Students are expected to keep this textbook at home aside from the days that they are specifically asked to bring it into class via a Canvas assignment.

---

## Philosophy of Consciousness and Personhood



### Goals

As the cognitive sciences make immense advances in understanding the relation of our brain to our mental states, many issues arise regarding how we understand ourselves and our relation to others: is our experience of ourselves defined by the matter in our heads? Is free will an illusion? What is the relationship of our sense of being human to our feeling of being conscious? Such questions have significant effects on ethical, medical, technological, and legal issues, informing, for example, what moral rights we might have to contend with should we build artificial intelligences (or if we should build them at all) or how we define cognitive disorders medically.

This course will be a reading and discussion seminar centered on the questions: "What is consciousness? What makes it difficult to study? Is the mind just the brain? Is consciousness also an illusion and what would that mean? Is our personhood and identity dependent on consciousness? How do these philosophical questions affect issues in our world?" We will read works in philosophy, cognitive and neuroscience, and science fiction, such as works by Aristotle, Nagel, Chalmers, and Watts; we will discuss ideas such as artificial intelligence, animal testing, X-men, IQ tests, and multiple personality disorder. There will be weekly readings, required discussion points, a mid-semester essay, and a final project.



The goals of this course are:

- to explore issues in philosophy of mind and cognitive sciences
- to develop student ability to discourse and write rigorously and philosophically
- to develop student ability to perceive and discover issues and facets of arguments in the intersection of interdisciplinary thinking
- for students to reflect on the intersection of philosophical questions and the effects of such questions on science and society

## Overview

The class will begin by trying to pinpoint what we mean when we discuss consciousness, and distinguish the phenomenon of consciousness from life, behavior, higher-order thinking, and logic. We will discuss whether consciousness is binary, an off-on switch to sudden awareness. We will also discuss what effect different models of consciousness have on our definition of personhood or the rights of beings. Building on our work defining and understanding what we mean by consciousness, we will investigate philosophical and neurological models of how consciousness works within itself. Can we be conscious without language? If consciousness is essentially representational models, what does that imply about our relation to our world? From here, we address the mind-body problem, the heart of the question of consciousness. Clearly, the brain is the basis of so much of our mental experience — but just how are they related? How can we determine whether our experience of being willed, conscious creatures is illusory? Does understanding the relation between brain and consciousness change our ethical stances towards conscious beings, or our notion of ourselves? Our questioning of the phenomenon and basis of consciousness has touched on some essential issues that the problem of consciousness raises for the concept of “personhood”: does our consciousness define our legal or ontological existence? Interwoven throughout, we will investigate how these seemingly lofty questions have real-world effects.

## Homework & Assignments

Students will have reading assignments most weeks and are required to submit discussion points and keep a notebook in this class. The class will include a collaborative project around issues at the intersection of philosophy, science, and society, a mid-semester rigorously worked essay on a topic of the student's choosing, as well as a science fiction story assignment around a concept we have discussed. While this class will provide ample time for writing in class during projects, students may have to finish their work at home some weeks, depending on speed or desire.

## Assessment

Assessment will be based on willingness to discuss deeply and respectfully, and engage in projects enthusiastically and innovatively. Depth of reading is the mechanism by which productive discussions can occur in this class. Process, effort, questioning, and reflection are valued in the class.

---

## Social Action Research (SAR)



### Overview

Action Research is a scientific methodology that can be applied to human, real-world problems. It is a method of doing research on complex social structures. Like critical theory, action research also attempts to change the problem as it is being researched.



## Goals

The ultimate goal of this class is to produce a student who can use evidence-based methods to both research and change human social issues. Examples include racism, the importance of meditation, the effect of formatting on comprehension — students will work on whatever problem they deem most important to them.

Over the course of the year, students will be doing multiple iterations of their research, running through the design, data collection, data analysis, conclusion-generating, and presenting stages multiple times. As they do this, they will be creating a thesis-style paper. In essence, the students will be writing a single report describing their research over the course of the semester.

## Leading from Within

There are several ways in which people can attack social problems. In this class, we will be using a lead-from-within strategy. This strategy involves intentionally invoking empathy for people involved with a problem and then working with them to a shared goal, a "work with" rather than a "work on" strategy.

## Resources

Most of our resources will be from Action Research journals, which are largely available online. We will also be looking at different strategies that people use to "attack" a problem. Most of these examples will come from YouTube.

## Assessment

Assessments in this class will be primarily skill-based. For example, I will ask a student to be able to methodically generate empathy for a situation and people involved in it. After students have demonstrated an understanding of a method they will be asked to demonstrate it in their own research.

## Time Commitment

Due to the nature of the research we are attempting, students will often have to come into the lab/research area outside of class meetings. For this reason, students will be working in teams. They will have to coordinate schedules and contribute to the work of their team.

## Producing a Scientist

This class is heavily geared towards social research. It is meant to be paired with other classes, such as Applied Molecular Biology or Advanced Research Methods, to produce a well-rounded scientist. Students can also take this class to learn how to attack difficult social problems.

---

## Applied Molecular Biology “Research Team”



### Overview

Biology and related sciences have the challenge of trying to “fix” some very large problems. Among these problems are maternal health, mental health, cancer, hunger, loss of plant life due to global warming, and cardiovascular disease.

When high school students study these world issues it is usually an academic exercise. Students learn about these issues and can propose fixes to them. Rarely do students actually take the next step and test their fixes. This class teaches students how to turn that intellectual exercise into actual bench work. In short, this class is aimed at teaching students how to run translational research.

### Goals

The ultimate goal of this class is to teach a student how to run advanced molecular biology experiments. The class begins with a “boot camp” in which students learn basic skills: pipetting, PCR, gel electrophoresis, transformation, primer design, restriction digests, and plasmid creation/basic cloning. Once the students have



learned these lab skills, they will do a project in which all skills need to be used to produce a single product. This will hone their bench skills.

Having learned and honed basic molecular biology skills, students will embark on the path of research. Research, in this context, is bench science that is designed to create new knowledge about a particular field. These fields often concern disease, and the projects are run with the support of nearby universities and companies. We will pick these projects later in the semester.

## Resources

There are several textbooks available for help. The main one is *Principles of Gene Manipulation and Genomics* (7th edition) by Sandy B. Primrose. In addition to this text we will be using protocols from nearby labs as well as the *Journal of Visualized Experiments* (JoVE).

## Assessment

The majority of assessments in this class will be skill-based. For example, students will be asked to accurately pipette and to run gels. We will use *Slack* to monitor how students plan their labs and set goals. Students will also be assessed on their ability to keep lab notebooks.

## Time Commitment

Due to the nature of the research we are attempting, students will often have to come into the lab outside of class. For this reason, students will be working in teams. They will have to coordinate schedules and contribute to the work of their team.

## Producing a Scientist

This is a lab-heavy class and is best paired with a class that teaches students how to analyze journals and design experiments.

---

## Advanced Research Methods (ARM)



### Overview

Advanced Research Methods and Applied Molecular Biology are both focused on lab research. Advanced Research Methods is principally devoted to methodology and how to develop new experiments, while Applied Molecular Biology is focused more on running specific projects.

### Goals

Students who take this class will be able to design rigorously constructed experiments in any science field. Students will also be able to propose novel experiments in a given field.

The goal in this class is for students to first design and then run a full cycle of a large-scale research project. Students will begin by studying exactly what abstract terms like theory, hypothesis, and prediction mean and how they influence experimental design. We then look at the development of controls, anticipate measurement by proxy issues, and hold constants.

### Resources

This class is almost entirely lab-based. Students will rely heavily on PubMed, Google Scholar, and the *Journal of Visual Experiments* to study research and new protocols.

### Assessment

The majority of assessments in this class will be skill-based. For example, I will ask a student to be able to properly control a previously unknown assay. After students have demonstrated an understanding of a method, they will be asked to demonstrate it in their own research.



## Time Commitment

Due to the nature of the research we are attempting, students will often have to come into the lab/research area outside of class. For this reason, students will be working in teams. They will have to coordinate schedules and contribute to the work of their team.

## Producing a Scientist

This class is heavily geared towards research methods. It is meant to be paired with other classes, such as Social Action Research or Applied Molecular Biology, to produce a scientist.

---

---

## Physics Research



### Goals

This course provides an opportunity for students to delve deeply into research topics selected by the U.S. Invitational Young Physicists Tournament (USIYPT) committee. These interesting topics are chosen to be accessible at the advanced high school level and usually require a combination of theoretical, numerical/modelling, and experimental investigation. The topics vary from year to year but often include phenomena in optics, classical mechanics, fluids, gravitation, and electricity and magnetism. Near the conclusion of the fall semester, students will summarize their work in the form of presentations to their peers and potentially others in the Nueva community, in preparation for a subset of students to compete in the USIYPT itself. The USIYPT is generally held in late January. Travel to the USIYPT is entirely optional.

### Weekly Class Structure — What to Bring

The class meets two or three times a week, always in a laboratory or with lab space available. Examples of tasks that a student might perform include: writing code to simulate the trajectory of an object subject to aerodynamic and gravitational forces, building an apparatus to generate and photograph rainbows formed from different liquids, or constructing a mathematical description of an extended solid object free to rotate about any axis. Extensive quantitative data analysis is also emphasized.

### Homework

There will be few if any conventional homework assignments. Students will be expected to conduct background research, work on software, etc. outside of class.

### Assessment

I expect to work closely with each student during the course of the semester and have an opportunity to see each student take on a variety of tasks. The template is necessarily general in form. Students will also be evaluated on their final presentations and ability to craft feedback to presentations by others.

---

## Differential Equations



### Overview

This elective introduces the students to the search for functions that satisfy a variety of growth properties. Unlike the more familiar algebraic equations, where the unknowns are numbers, here the unknowns are the functions themselves. We explore constructive solution techniques, like the integrating factor, characteristic equations, the Laplace transform, and Fourier series. We proceed to investigate systems of differential equations and their asymptotic properties, in applications ranging from physics and biology to economics and



engineering. We combine analytic methods with computational ones that allow us to simulate, approximate, and visualize complex dynamics. The course is structured around a series of group projects, based on mathematical modeling challenges.

## Goals

- Identify and exploit change of variables that render equations in separable form
- Employ an array of integration techniques to obtain closed-form solutions whenever possible
- Infer existence, uniqueness, regularity properties, and asymptotic behavior of solutions without explicitly solving the equation
- Investigate driven response of dynamical systems and their resonant behavior potential
- Exploit vector space and spectral techniques to analyze the behavior of dynamical systems
- Represent real-world dynamic relations in terms of differential equations and assess their symmetries, robustness, and sensitivity to initial and boundary conditions

## Homework

Homework will include readings from the textbook *Introduction to Differential Equations*, by Michael E. Taylor, as well as several articles and excerpts from other books. It will also involve writing about mathematical ideas, including ways to communicate our observations about function properties, construct compelling arguments, and apply them in modeling real-world situations. Finally, homework will involve work in computational environments to simulate the behavior of dynamical systems. Often homework will be a continuation of classwork. Not infrequently this will entail group work, with each student contributing different components of a joint online document. This will also involve preparing in-class presentations and offering comments on peer work.

## Assessment

The students will be assessed for their work in classroom activities and homework assignments. Each student will curate a portfolio of their work during the semester, with the teacher's assistance. These portfolios will showcase diverse pieces of work, including the student's contributions to group deliverables, both written and oral. Portfolios will also include the student's online journal, which the students use to record their ongoing observations, conjectures and discoveries, as they engage with all the class activities. These portfolios are individualized artifacts and can include all kinds of work, such as written arguments, videotaped presentations, and computer simulations.

## Materials

We will make ample use of the computer, both for in-class activities and homework assignments. Specifically, we will use a variety of math modeling environments, including Matlab and its various toolboxes. We will also have opportunities to practice the use of mathematics typesetting software, including LaTeX.

---

## Introduction to Computer Programming



### Overview

Students will practice computational thinking through short projects, including virtual art, game creation, and data analysis, as well as in-class discussions. Projects and assignments will use mostly Python to create programs that can easily be shared and tested with real users. The class will culminate in a final project written in a language of the student's choice. The final project could be a game, art piece, web app, or . . . ?



## Goals

Students will:

- Become proficient with basic programming constructs — variables, loops, conditionals, functions, and lists
- Practice breaking down problems and debugging solutions
- Become comfortable using existing sources of code and data to create new projects
- Learn to courageously explore new tools and seek out additional resources

## Homework & Assignments

Most work will be done in class, but students may occasionally finish work at home.

## Assessment

Students will be assessed in the following areas:

- Programming skill/quality of code
- Ambitiousness of final project
- Conscientiousness on in-class assignments
- Ability to manage setbacks and adjust goals

Assessment will be done through code submissions, teacher observation during in-class work periods, and self-reflection.

---

## Computer Internals



### Overview

Build your own computer in simulation! What are the structures underneath the abstractions of computer applications and programming? How does a computer really work? Why do computers use binary representations and assembly language, and how are those related to the electronic components underneath and the higher level languages on top? We'll investigate these questions by building our own CPUs in simulation. To do this, we'll need to create logic gates, adders, and registers and connect them together in order to fulfill the contract of our own assembly language.

### Goals

All students will:

- Understand the basic underlying abstractions used in creating CPUs
- Understand how to design circuits that can implement logical and sequential functions
- Learn how to organize circuits hierarchically to implement more complex systems
- Create their own machine language and a simulated system that can execute instructions in that language

### Homework

Students will need to do some research, brainstorming, and analysis at home. Work on circuit design will be done in class, but students may occasionally need to finish tasks at home.

### Assessment

Assessment will be done through code and circuit submissions, write-ups or presentations of work, teacher observation during in-class work, and self-reflection.



---

## Full Stack Web Development



### Overview

Web applications that we use on a daily basis often are built with many parts that we don't see. Students will work through understanding what a full stack web app can include, how it works, and then they will create projects themselves. They will increase their JavaScript, HTML, and CSS skills while building an understanding of what it takes to create a web app that can create, read, update, and delete data in order to create a more persistent user experience. The beginning of the semester will include smaller projects that will build skill and knowledge, then we will move into larger projects to practice and expand programming expertise.

### Goals

Students should be able to:

- Create responsive front ends for their web apps
- Understand and utilize at least one front-end/CSS framework
- Understand and create ways for front-end and back-end programs to communicate
- Understand and create the different components for a full stack website
- Understand database structure and use a database to create, read, update, and delete data
- Build a web app utilizing all full stack structures learned over the course of the semester

### Homework & Assessment

Most work will be done in class. However, there will be times when students are asked to do research or prepare in other ways for their project. Anything not finished in class can and should be finished at home. Students are also encouraged to spend time practicing and studying any subjects that they find particularly challenging.

Students will be assessed in the following areas:

- Programming skill/quality of code
- Ability to manage and build large-scale projects
- Ability to set and reach for goals that stretch their personal understanding
- Ability to reflect and grow based on feedback given

Assessment will be done through code submissions, teacher observation during in-class work periods, and self-reflection.

---

## Machine Learning



### Overview

We are currently generating huge amounts of data about any number of aspects of life on Earth, at a rate well beyond the capacity of humans to absorb. How can we use machines to learn from these datasets and make predictions or decisions about the future? In this class, we explore a number of different data analysis techniques, from simple regression to more complicated neural network structures. For each of these, we'll discuss what different types of questions we can answer and what requirements our data encoding must meet. We will examine the ethical issues that might arise in training models on large datasets. The class will focus on the use and high-level understanding of machine learning methods, but students with more math background may choose to delve into the underlying mathematical definitions as well.



## Goals

All students will:

- understand how to use and choose between a variety of machine-learning algorithms
- understand how to represent problems and gather data for use in machine-learning tasks
- grapple with the ethical issues that arise in machine-learning work
- learn how to communicate data science results
- continue developing their computer programming skills

## Homework

Students will need to do some research, brainstorming, and analysis at home. Programming work will be done in class, but students may occasionally need to finish tasks at home.

## Assessment

Assessment will be done through code submissions, write-ups or presentations of work, teacher observation during in-class work, and self-reflection.

---

## Advanced Programming Workshop



## Goals

Students will:

- Increase mastery of programming constructs
- Gain deeper knowledge of a particular computer science subfield
- Gain basic knowledge of the subfields chosen by their peers
- Become proficient in explaining and summarizing their research

## Overview

Through individual or group projects and readings, students will deepen their knowledge in a particular subfield of computer science of their choosing. At regular intervals, they will go over their progress with the teacher, decide on next steps based on their learning goals and recent work, and receive feedback. Twice during the semester, they will present highlights of their research and work to their peers.

## Homework

Most work will be done in class, but students may occasionally need to finish work at home to be ready for a presentation or meeting with the teacher.

## Assessments

Assessment will be done through code submissions, teacher observation during regular meetings and in-class work periods, presentations or write-ups of work, and self-reflection.

---

## Computer Aided Design (CAD)



## Overview

From basic CAD to advanced parametric modeling, this class will dive deeply into Fusion 360 and how it can be used for advanced modeling, rendering, and assemblies. We will discuss advanced tools like lofting, 3-D sketching, advanced assemblies, etc. Open to all students — no prerequisites.



## Goals

- Deep understanding of 2-D sketching, dimensioning, and relationships
- Knowledge of basic and advanced tools, including revolves, splines, lofts, etc.
- The ability to build components parametrically with working relationships
- Understanding of joints, components, and relationships assemblies and movements

## Homework

Homework will consist of various assignments in Fusion 360; uploads will be screenshots of completed work or links to completed files. All homework can be resubmitted as long as an initial attempt is submitted on time.

## Assessment

Assessment will be 40% skills & practices, 30% content knowledge, and 30% habits of mind.

---

## Introduction to Fabrication



## Overview

This class is designed for students who are new to the I-Lab and/or want to build a strong foundation for I-Lab skills. From deciding what saw to use for a cut to how to pick out appropriate hardware, we will discuss methods as well as best practices and will have a series of structured projects along the way. Open to all students — no prerequisites.

## Goals

- Familiarization with the I-Lab space, tools, and safety protocols
- Understanding the differentiation and application of materials and hardware
- The ability to fabricate basic forms in wood, plastic, and metal
- Familiarization with basic mechanical movements

## Homework

Work will need to be done in class or in the I-Lab outside of class — students will be asked to submit documentation of work completed.

## Assessment

Assessment will be 40% skills & practices, 30% content knowledge, and 30% habits of mind.