Course Catalog — *Arts*

A2414: Conceptual Art Practices
Amanda Moore, Wayne Stokes
What is conceptual art? In this class, we will explore the notion of conceptual art. Students will learn to map their own artistic project through exercises in drawing, writing, performance and sculpture. Class time is designed to function as a jumping off point for the development of individual projects outside of the classroom. Each student will create a PowerPoint presentation in order to communicate their inspiration and ideas, while developing and refining their public speaking, performance, and improvisation skills. Students will be encouraged to work collaboratively, engage in critical dialogue, and envision their artwork in new ways through critical readings, class discussion, visiting artists and presentations of contemporary work.
Please note: Students are expected to develop a final project throughout the course of this class, which may require additional work outside of class. In order to get the most of the class, consistent attendance is required.
Open to students grades 9 through 12
Maximum Size: 30
Sun 10:00am–12:00pm

A2400: Intro to Photography
Ashley Nash
This course will teach different forms of photography, both its history and its application. Each class will have a brief introduction to a topic, and the rest of the class will explore said topic. The class will end with a final project, giving students a chance to practice what they have learned or to embark on something new.
Open to students grades 9 through 12
Maximum Size: 8
Sun 10:00am–12:00pm Sun 3:00pm–5:00pm

A2405: Sound in the 20th Century
Nick Seaver
Can you play a piano by hitting it with a hammer? What is the difference between noise and music?

This course will look at the history of sound in the arts over the course of the 20th century, from Futurist noise-makers, through John Cage and his infamous "silent" pieces, to the present day. We'll talk about how sound is used, listen to examples of experimental music, and even make some of our own!

For an idea of some of the things we'll be talking about (and doing), check out the videos here: http://nickseaver.net/piano.html
Open to students grades 9 through 12
Maximum Size: 10
Sun 1:30pm–3:00pm

Course Catalog — *Engineering*

E2402: Biological Engineering for Beginners
Leigh Casadaban, Alina Gatowski
This class will teach a wide range of basic skills intended to prepare you for future studies in Bio-Engineering. The topics will include:
*Biochemistry
*Genetics
*Modeling with Python
*Thermodynamics
*Bio-mechanics
*Fluid mechanics
Open to students grades 9 through 11
Maximum Size: 20
Sun 10:00am–12:00pm

E2427: Electric Vehicles: Past, Present, and Future
Tyler Liechty
Electric Vehicles are becoming more than just toys and projects for people to throw money at. Electric Vehicles are becoming a subject you can't ignore, so come learn about them.
Open to students grades 7 through 12
Maximum Size: 40
Sun 10:00am–12:00pm

E2431: Electronic Fashion
Brianna Conrad
Learn how to build a shirt that sings when squeezed, a purse that sounds an alarm when someone touches it, or a jacket that shines and sparkles at your command. In this class we'll use sewable computers, conductive fabric, conductive thread, LEDs, and speakers along with the Lilly Pad Arduino toolkit to explore circuits and programming and create cool interactive garments (or whatever else you can think of to make) incorporating touch sensors, light and sound. Appropriate for those who have no experience with circuits and programming, and those who have and want to get a bit more creative.
Open to students grades 7 through 12
Maximum Size: 10
Sun 10:00am–12:00pm

E2362: Intro to Engineering
Michelle Bentivegna
Do you think you might want to be an engineer, but don't know much about what an engineer does?

In this class, you will learn how to design your own Photoshop software, build a bridge and decontaminate a river. The class will offer a mixture of lecture-based and activity-based classes.

The following engineering disciplines will be offered (subject to change).

Mechanical Engineering
Civil Engineering
Environmental Engineering
Computer Science
Aero/Astro
Chemical Engineering
Electrical Engineering
Biological Engineering

While this class will be open to HSSP students of all ages, it is designed to be an introductory course. Math will be kept at a basic level, and older students might be bored.

Each class will be taught by a different teacher, so it will be more like a series of seminars on engineering than an actual class.
Open to students grades 8 through 10
Maximum Size: 30
Sun 1:30pm–3:00pm

E2435: Electronic Principles
Adnan Zolj
The goal of this course is teach you enough about electric circuits so that you can become a hobbyist. We will study some introductory circuit theory and learn about resistors, capacitors, inductors, diodes, transformers, transistors and op amps.

Students should know how to differentiate, integrate, and should have taken one semester of physics. This course may be helpful for AP Calculus BC, AP Physics C preparation or the science fair.

Note: Description has changed, (No, you're not going crazy.)
Open to students grades 11 through 12
Maximum Size: 16
Sun 3:00pm–5:00pm

Course Catalog — *Humanities*

H2428: Comparative Linguistics
Daniel Briggs
Want to find out how the world's languages are related to each other? What do we mean when we say English is Germanic, Russian is Slavic, but they're both Indo-European? How can we prove it, and can we go any further? You'll find out if you take this class, and you'll also become an expert in the methods of linguistics. We'll go over everything from the International Phonetic Alphabet to semantic drift to Chomsky's language universals and Mark Baker's theory about language typology. Homework will mostly be in the form of puzzles.
Open to students grades 7 through 12
Maximum Size: 150
Sun 10:00am–12:00pm

H2383: How to Change the World: Global Poverty and Solutions
Hrishi Poola
"The more one looks at it, the more one sees that the question isn't whether the rich can afford to help the poor, but whether they can afford not to." -Jeffrey Sachs

The world is growing and advancing so rapidly, with more and more people being pulled out of poverty and achieving true development wonders. However, there are over 1 billion people that are still being left out and millions die yearly from easily preventable and avoidable causes. Additionally, our world is more connected than ever, in which the actions of someone in Lagos, Nigeria, or Delhi, India, or Uganda truly impacts our own lives (and vice versa) more than we initially imagine.

The course will look at the crossroads of the challenges, opportunities, and solutions. What are the common misconceptions of Africa? What are the demographics and size and scope of the problems? How did the world get to where it is now? What has been done in the past? What has worked and what were the mistakes? What are the poverty traps? What are the Millenium Development Goals? What are the best solutions?

Poverty is not just having low income, but is a complex interplay of health, climate, topography, disease (malaria, HIV/AIDS, TB), education, roads, power, communication, sanitation, government, law, business, trade, and culture.

The millions of lives saved today are not due to governments, but the actions of individuals and small groups, especially high school and university students. The is a course to help understand global issues and to help students "think big" and confidently guide state and federal government, as well as to come up with solutions by thinking uniquely, technically, openly, empathetically, and creatively. "We have exciting times ahead and no time to lose."
Open to students grades 10 through 12
Maximum Size: 30
Sun 10:00am–12:00pm

H2367: Introductory Latin
Pamela Alvarez
Ever wanted to give orders like Julius Caesar or declaim like Cicero? Then learn Latin, the language of the ancient Romans! In this course for beginners, we will cover most of the basics of Latin grammar, including all the declensions and regular verb conjugations. Each class, we will read simplified and original texts (in Latin, of course!) about entertaining and important events in Roman history. Depending on student interest, other activities might include reading excerpts from Harry Potter in Latin, watching an episode of Asterix along with our discussion of Julius Caesars Gallic Wars, or reading Latin texts about mythology.

Prerequsite: Motivation! Latin isnt as easy to learn as commonly taught modern languages like Spanish or French, so it will require a bit more effort. I promise to make it fun, though! Some very light homework will be assigned.
Open to students grades 7 through 12
Maximum Size: 15
Sun 10:00am–12:00pm

H2432: Inventions that Made History
Susan Shepherd
In this age of rapidly advancing computer technology and microgadgets, it can be difficult to put the technology and societies of yesteryear into context. Just how developed was Roman society compared to ancient Egyptian or Mayan society? What fundamental discoveries and inventions changed the course of history - and which of today's discoveries will shape the societies of tomorrow?

To answer these questions, we'll take a look at the developments that changed the world - from the horse collar and metal tools to the steamboat and positron emission tomography - and make some educated guesses about the world we'll be living in twenty years from now.
Open to students grades 7 through 12
Maximum Size: 40
Sun 10:00am–12:00pm

H2410: The Short Story and the Short Short Story
Xiao Yu Wang
Have a lot to say but not that much time to say it? Ever wonder how entire lifetimes blossom and recede within a matter of pages? Do you ever wave a particularly brilliant story at a perfect stranger, proclaiming, "You have GOT to read this"? Have you ever spent an entire morning typing one sentence, and an entire afternoon deleting it? Or do you just, well, love to write?

The aim of this course will be to push the boundaries of the short and short short story forms, but also to expose you to the broadest possible range of work. Most importantly, the focus will be on your writing, and the opportunity to read the work of your peers–the class will be *extremely* interactive. Finally, at least one class will be dedicated to experimental literature.

The only way to improve as a writer is to write and read as often as possible, and to build lasting friendships with fellow writers. I hope this class serves as a springboard for all of these things. I think we'll have tons of fun!

Note: I also believe food is a critical part of the writing process.
Open to students grades 10 through 12
Maximum Size: 8
Sun 10:00am–12:00pm

H2413: Japanese Media: Fan Perspectives in the US and Japan
Maryia Lu
An open forum-style class about Japanese culture with a focus on media and pop culture. Anime, manga, music, television, video games, fashion, sports, etc - we will consider these topics in respect to how US fans view Japanese culture versus how it is viewed in Japan. Do you have any questions about Japanese culture? Do you wonder why androgyny is so prevalent in Japanese media? Do you want to understand more about the controversy surrounding fansubbing in the United States with respect to anime studios in Japan? Do you wonder why sumo and baseball are so popular in Japan? Come join the discussion!
Open to students grades 9 through 12
Maximum Size: 30
Sun 1:30pm–3:00pm

H2389: Learning to Love Politics
Gregory Westcott
Politics: some people get upset over it, others seek to debate it, many simply ignore it. At its core, politics is the way that our values interact with our government(s), and the complexities that arise are based on complexities and nuances in those values as well as the intricacies of our system of government. To begin to understand how those things work and, more importantly, how you stand on the issues and how to act on those stances, you have to start at the bottom. There are many stereotypes and assumptions that cloud our understanding, and politicians are masters at using words and images to sway voters. Let's get to the bottom of it all: what do Democrats and Republicans really stand for? What about socialists and Libertarians? How can we try to understand what's really going on in the world of political speeches, talking heads, elections, legislation, and so on? This course will start with the basics of political parties and why they disagree, and work up to discussing contemporary and traditional political debates of interest.

Who should take this class?
Anyone who has an interest in politics. We will start slowly with basic concepts and work up to somewhat more theoretical concepts. The goal is to keep students of a wide range of backgrounds interested, and class discussions will allow input from anyone who wants to (respectfully) share their opinions.
Open to students grades 7 through 12
Maximum Size: 20
Sun 1:30pm–3:00pm

H2394: Sex, Drugs, and the Other Taboo Questions
Luis Lafer-Sousa, David Thompson
NOTE: The first section is for students in grades 7th-9th, and the second section for students in grades 10th-12th. Please sign up for the appropriate class, thank you.

Sometimes there are those questions that you just can't ask your parents or teachers. You feel awkward, are worried you will get in trouble, or maybe you are just too embarrassed. In this class, well take an honest approach to answering those in a comfortable and safe environment.

From condoms and STDs to alcohol and marijuana, we will spend the first part of class covering a variety of topics that are normally considered controversial. We will start with a simple of explanation of what each is, and move all the way up to the potential dangers and risks associated with it. The second half of every class will be your chance to submit anonymous questions that we can answer and discuss together.

Students must have a permission form signed by a parent/guardian to participate in this class. The form will be posted later on.
Open to students grades 7 through 12
Maximum Size: 12
Sun 1:30pm–3:00pm Sun 3:00pm–5:00pm

H2422: Western Philosophy
Marcel Nunez
Many of history's greatest minds have been philosophers. This course explores the beliefs of such giants as Socrates, Aristotle, Descartes, Kant, and Sartre in their historical contexts. Through class discussion, students will debate the same abstract problems faced by historical figures in fields such as metaphysics and epistemology. Students learn to formulate logically consistent opinions. Both lecture and discussion are integral. Class participation is key to learning.
Open to students grades 7 through 12
Maximum Size: 20
Sun 1:30pm–3:00pm Sun 3:00pm–5:00pm

H2392: World Mythology
Diana Wu
An introduction to the study of various civilizations as these are revealed in their myths and legends. It is intended to get you started on exploring the fabulous realm of the human imagination in history. The focus is on the stories and

archetypes as they symbolically express deep cultural values.

We will survey ancient stories about heroes, gods, and the universe and how these myths have influenced the art, literature, and culture of their respective cultures and the modern world we live in today.
Open to students grades 9 through 12
Maximum Size: 17
Sun 1:30pm–3:00pm

H2442: Playwright's Workshop
Daniel Zaharopol
Join us as we share in reading and writing interesting plays. Learn and practice the art of writing compelling scenes. Understand characters and on-stage action more deeply. How can you bring the audience into your scene and enable them to connect with your characters? How do you build conflict and make it realistic as it drives the piece? How do you, as a writer, collaborate with the director and actors? In each class, we'll read interesting modern pieces and then workshop each others' work in a relaxed environment. We'll address all of these issues and more. Whether you're new to writing or an old pro, a beginner or experienced with the theater, this is a great way to exercise your creative writing side.

Important notes: This class will require writing at home. You should be ready to take openings from class and flesh them out into plays each week. Don't worry if you've never written like this before: this is a great place to start!

Additionally, please be aware that some plays we read will cover adult themes, and although we will avoid excessive profanity, cursing is a part of realistic modern-day speech. You'll never have to take on any roles you're not comfortable with, but do come prepared for us to tackle all kinds of issues.
Open to students grades 9 through 12
Maximum Size: 15
Sun 3:00pm–5:00pm

Course Catalog — *Math & Computer Science*

M2417: Exploring Symmetry
Wing Ho Ko
Think that math is just plug-and-chunk? Feel that math is static, rigid, and boring? If so, this class may change your mind!

We will be exploring symmetry - one of the most far-reaching ideas in mathematics - visually and interactively. Want to design your own wallpaper pattern? Want a general way of constructing intrigue figures that realize a particular symmetry? Want a know why A and B should be put into the same (symmetry) class, but not Z? Then please join!

The only real prerequisite for this class is your intellectual curiosity. Proficiency in standard school mathematics may be helpful but is not essential.
Open to students grades 7 through 9
Maximum Size: 22
Sun 10:00am–12:00pm

M2429: Intro to Artificial Intelligence
Adam Hartz
An introduction to computer science, focusing on practical applications of AI, primarily in computer games. Learn about common AI techniques through discussion and examples, and also by programming them yourself in Python (no previous experience necessary).

The course will culminate in a tournament of student-created AI bots in a computer game.
Open to students grades 7 through 12
Maximum Size: 20
Sun 10:00am–12:00pm

M2396: Introduction to Cryptography
Paul Christiano
Suppose you and a friend are talking to each other, but an eavesdropper hears every word you say. Can you still communicate without letting the eavesdropper learn anything about your conversation?

Is it possible to end your emails with signatures which no one else can forge?

We will discuss solutions to these and other problems of a similar flavor. The focus will be skewed towards obtaining solutions which are provably secure rather than particularly practical.
Open to students grades 9 through 12
Maximum Size: 16
Sun 10:00am–12:00pm

M2424: Preparation for AP Calculus
Brenna Hogan
This class is designed for students wishing to gain an advantage in their preparation for the AP Calculus exam. The material covered will be based off what is outlined by the College Board, including the understanding and application of derivatives and integrals. In addition to lecture, we will work through a variety of problems in class. There will be optional homework assignments, including MANY practice AP exams. If you've already taken pre-calculus and you're looking for a productive way to spend your summer, come join us in studying single-variable calculus!
Open to students grades 9 through 12
Maximum Size: 22
Sun 10:00am–12:00pm

M2365: Topics in Mathematics (Including Applications to Physics)
Lester Kim
In this course, we will cover various topics in mathematics including set theory, algebra, topology, and calculus. Relevant applications to physics will also be covered: classical mechanics, electricity/magnetism, quantum mechanics, and relativity.
Open to students grades 7 through 12
Maximum Size: 120
Sun 10:00am–12:00pm

M2446: Counting Principles
Andrew Spieker
The summer isn't fun without getting your feet wet with something new! This summer, we're going to take a new spin on some old topics in mathematics, with an emphasis on enumerative combinatorics. Woah, what?!

Enumerative combinatorics is the study of counting; of course you all know how to count, but in this course we will be able to answer questions like "How many ways can I rearrange 5 blue books and 3 red books so that no two red books are adjacent." What sometimes these questions seem trivial, we will see that they are in fact the root of a lot of problems in mathematics.

Expect to think in new ways; expect to work in groups; expect to have fun! Don't be afraid to try something new.
Open to students grades 10 through 12
Maximum Size: 40
Sun 1:30pm–3:00pm

M2408: Game Theory - Making the Right Moves
Rui Luo, William Morejon
Want to better your bargaining skills? Want to learn how

to make well-thought-out threats? Want to conquer the world through political manipulation? Want to know how gang leaders successfully run their drug cartels? Want to better your chances in the next million dollar game show? This class will give a lighthearted introduction to all the topics mentioned above and more including decision making, Nash, Perfect, Sequential Equilibrium, Social/peer pressure/political/economic modeling, Making threats, Signaling, and Reputation, Bargaining/Auctioneer Theory, and a little bit of Psychological Games.
Open to students grades 9 through 12
Maximum Size: 30
Sun 1:30pm–3:00pm

M2436: How to Design Programs (Intro to Comp Sci)
Marc Held
Kick the crud out of any Freshman College computer science course by learning Scheme and learning it well. I plan on teaching you more about computer science in a few weeks than most people learn in a year of college.

This course isn't only for beginning computer scientists, people who know other languages could always learn how to think functionally (more about this in the course).

Plus, we'll get to build video games!

The only prereqs are that you want to learn how to think about programming. We'll be using a lot of strange concepts that you wouldn't usually get in your run of the mill intro computer science course, but It'll help cement your brain into being fantastic with code.
Open to students grades 9 through 12
Maximum Size: 22
Sun 1:30pm–3:00pm

M2397: Mind, Meaning, and Godel's Incompleteness Theorem
Catherine Olsson
Godel's Incompleteness Theorem shows that no matter how rigorously you construct a formal system of number theory, there will always be true things that the system can't prove, or it will be inconsistent (ie, "broken")

We'll take this delightfully rich and self-referential mathematical proof as our jumping-off point.

Along the way, well explore ideas of truth and provability, self-reference (such as this statement is unprovable, or your own idea of "self"), whether computers can think, and how "meaning" is encoded in math, language, and your mind.

Come explore the fringes of truth, self-reference, the limits of knowledge, and the meaning of life.

Familiarity with formal logic and/or philosophy of mind is helpful, but certainly not required to take this course. All that you need is a sense of wonder, and desire to learn an awful lot in an awfully short span of time!
Open to students grades 10 through 12
Maximum Size: 10
Sun 1:30pm–3:00pm

M2421: Number Theory and Other Random Math
Letitia Li
Whats a recurrence? And why does it help with algorithms? If I have n newts, t toads, and s slugs, how many ways can I make n+t+s people miserable by putting my animals in their beds? In number theory, we will learn about the properties of numbers, in particular, integers. We will learn about how to effectively determine whether an integer is prime or not, how to prove the sqr root of 2 is irrational. We also learn a bit of cryptologyusing numbers encoding messsages. You will be sending secret messages and ask people to decipher them. Learn about encryption, probability, induction, and other random topics in math. Great for students who want to learn a different kind of math than the kinds taught in high school.
Open to students grades 8 through 12
Maximum Size: 30
Sun 1:30pm–3:00pm

M2426: Algorithms and Dynamic Programming
Oscar Moll
Algorithms are a handy way to motivate mathematical concepts.

Dynamic programming algorithms, in particular, are a great way to motivate concepts of recursion, induction and to familiarize yourself with mathematical structures such as graphs.
Open to students grades 8 through 11
Maximum Size: 15
Sun 3:00pm–5:00pm

M2438: How to Design Classes (Intro to Comp Sci: OO style)
Marc Held
Kick the crud out of any Freshman College computer science course by learning Java and learning it well. I plan on teaching you more about computer science in a few weeks than most people learn in a year of college.

This course isn't only for beginning computer scientists, people who know other languages could always learn how to think functionally and Object-orientedly (more about this in the course).

The only prereqs are that you want to learn how to think about programming. We'll be using a lot of functional programming in java (yes, I know... functional and java in one sentence!?!) but if you've got some other previous programming language in your brain it might be easier.

This course will be challenging, but rewarding.

If you have no experience coding, I suggest taking How to

Design Programs (Intro to Comp Sci) but if you really really would rather learn java, give me an email.
Open to students grades 9 through 12
Maximum Size: 35
Sun 3:00pm–5:00pm

M2391: Natural Language and Artificial Intelligence
Gregory Marton
A first introduction to computer programming (in Scheme) with a focus on how computers understand (and misunderstand!) natural languages like English. The study of language offers a unique window into the mind, and we will explore how artificial intelligence relates to natural intelligence. Students will write programs to explore the meanings of individual words, phrases, and sentences. Students will learn how search engines work, how computers can translate between multiple languages, and identify authors. Students will encounter very strange English sentences, and learn what makes them confusing or humorous.
Open to students grades 9 through 12
Maximum Size: 17
Sun 3:00pm–5:00pm

M2437: Number Theory and Other Random Math
Zoe Xiao
Number Theory and Other Random Math

Whats a recurrence? And why does it help with algorithms? If I have n newts, t toads, and s slugs, how many ways can I make n+t+s people miserable by putting my animals in their beds? In number theory, we will learn about the properties of numbers, in particular, integers. We will learn about how to effectively determine whether an integer is prime or not, how to prove the sqr root of 2 is irrational. We also learn a bit of cryptologyusing numbers encoding messsages. You will be sending secret messages and ask people to decipher them. Learn about encryption, probability, induction, and other random topics in math. Great for students who want to learn a different kind of math than the kinds taught in high school.
Open to students grades 8 through 12
Maximum Size: 35
Sun 3:00pm–5:00pm

Course Catalog — *Miscellaneous*

X2382: Development of the Solar System
Andrew Rader
Humanity stands on the cusp Type II civilization!

Students will form teams to compete to develop our solar system from 2030-2150 in a constantly evolving system (significantly updated from previous years).

Each team will play an Earth faction (US/Russia/China/EU/Japan/Asia/South America), and manages their policies, technology, economy, military, bases, and spacecraft. See www.newhorizongames.com for more information.
Open to students grades 10 through 12
Maximum Size: 30
Sun 1:30pm–5:00pm

X2430: Slavery Today
Eric Goodwin, Brandi Harless, Shobha Narasimha
Some scholars estimate that there are 27,000,000 slaves in the world today, including in the US. These slaves are of all different races and backgrounds and are kept in slavery by means of mental and physical violence. This course will illustrate and discuss the elements of slavery, the diverse circumstances that allow slavery to continue, review current efforts to end slavery, and challenge students to consider ways that they can fight slavery.

Enslavement deprives victims of their human dignity. Portions of this class will include discussions of the circumstances and actions that assault and strip away that dignity from the victims. Some of these topics include modes of violence such as forced drug addiction, sexual violence, psychological and physical torture as well as depression and suicide. These topics represent only a portion of the class and will not be individually inspected in a detailed manner. Other sometimes controversial topics will also be discussed including gender roles in society, public corruption, and the role of faith based efforts in abolition. Further topics will include differentiation between advocacy, practitioner, and academia based abolition; how abolition works to provide victim services, reduce slavery demand, and reduce victim supply; also for discussion will be the many different forms of slavery and victim health.

Prospective students are asked to discuss the subject and their class attendance with their parents or guardians before enrolling. Students enrolling in the course will be required to have a permission slip signed by a parent or guardian. Prospective students are welcome and encouraged to contact the teacher through the email on his bio page, or the program administrators, with any questions or concerns.
Open to students grades 9 through 12
Maximum Size: 150
Sun 1:30pm–3:00pm

X2384: Leadership Training Institute Summer Session
Amanda Mok, Christopher Ohlmacher, Jia Zhu
Learn and practice the different skill sets that leaders possess in a fun and interactive setting. Classes will consist of skill-building activities, in-depth discussions, and self reflections.
Open to students grades 9 through 12
Maximum Size: 40
Sun 3:00pm–5:00pm

X2390: Magic the Gathering
Graham Rogers, Tom Xu, Ben Yee
This class is designed to teach students how to play Magic the Gathering. On the first day students will be divided into two groups an advanced group and a beginner.
Open to students grades 7 through 12
Maximum Size: 20
Sun 3:00pm–5:00pm

X2409: Stage Managing - An Introduction to Controlling Theatrical Magic
Rebecca Bianco, Catherine Redfield
This course is intended for nascent stage managers and anyone else with a theatrical bent. We aim to give a good overview of all aspects of technical theater, as a stage manager's job is to understand and be able to work with all aspects of a production. Each session or two will focus on a different aspect of technical theater, including set construction and design, lighting, props, costumes and makeup, among others.
Open to students grades 7 through 12
Maximum Size: 15
Sun 3:00pm–5:00pm

X2385: The Crash Course Course
Jordan Persson
The Crash Course Course returns from sabbatical to bring you another session (and new material!) of the class that does something different every week. Whether we're discussing acting, psychology, music or the art of BS, you're sure to learn something fun and useful.

Prerequisites: A willingness to speak up and share ideas.
Open to students grades 10 through 12
Maximum Size: 30
Sun 3:00pm–5:00pm

Course Catalog — *Science*

S2395: Chemistry of the Elements
Brian Lee
Everyone knows about the Periodic Table of the Elements. But for most people, it's just that - a table. Come learn about the quirks and strange personalities of the elements!

Students should know basics of chemistry (what atoms are, how to balance simple chemical equations)
Open to students grades 7 through 12
Maximum Size: 70
Sun 10:00am–12:00pm

S2445: The Science of a Bottle of Coke (And Other Everyday Objects)
Vincent Lee
Have you ever stopped to think about how many thousands of years of compounded technology goes into making even the simple things in our modern world?

This class will show how to deconstruct simple items into a vast, almost infinitely detailed web of technologies, built one upon another, resulting in a huge amount of information and history stemming from something as simple as an incandescent light bulb.
Open to students grades 8 through 12
Maximum Size: 20
Sun 10:00am–12:00pm

S2440: Frontiers of Physics
Chris Kennedy
The twentieth century was the century of physics. So where are we now? In this class, we'll explore the awesome phenomena and techniques of modern physics.

Among the topics we'll cover: superconductors, Bose-Einstein condensates (a collection of atoms collapse to look like a single atom), extremely low temperatures and how to get there, the accelerating expansion of the universe and dark matter, and much more! If you have specific topics you want discussed, bring them to the first class and I'll try to include them.

Note: this will be taught at a fairly high level; you should have a year of high school physics under your belt, and you'll get more out of the class if you know some calculus (though I'll try not to use it too often).
Open to students grades 9 through 12
Maximum Size: 35
Sun 1:30pm–3:00pm

S2406: Genetics
Ciara Lomax
This class will cover genes and how they are in herited from ancestors. Topics may include mitosis and meisos, Mendel's Laws, recombination/linked genes, punnett squares, and genetic diseases.
Open to students grades 9 through 12
Maximum Size: 40
Sun 1:30pm–3:00pm

S2444: Introduction to Neuroscience
Greg Hale, Mark Howe, Beata Jarosiewicz, Xiao-Ping Liu, Joshua Sarinana
The human brain is made of about ten billion neurons and more than one trillion
neuron-to-neuron connections. Scientists can study the behavior of individual neurons and their connections like any other physical system. Yet they are only grazing the surface on how this remarkable network of interacting neurons can serve as the physical embodiment of our personalities, perceptions, memories, decisions, and habits. We invite you to come explore mysteries of the brain and the mind with us. In this course we will introduce you to what scientists know, and what scientists don't yet know, about the way the brain works. We will discuss current techniques in neuroscience research, and explore the field by dissecting sheep brains (optional activity).
Open to students grades 10 through 12
Maximum Size: 20
Sun 1:30pm–3:00pm

S2439: Biology of Aging and Cancer
Evan Hefner
This class covers what goes wrong in our cells that causes them to become cancerous, why our bodies tend to break down as we get old, and what we can do about it. It will also teach some of the basics of genetics and cell biology through their applications to these areas.
Open to students grades 9 through 12
Maximum Size: 20
Sun 3:00pm–5:00pm

S2443: How Your Brain Gets Information: An Introduction to Sensation and Perception
Brandon Moore
Have you ever wondered how exactly we see, hear, taste, smell, or feel things? This course explores how senses work and how physical stimuli get transformed into signals in the nervous system, as well as how the brain uses those signals to determine what's out there in the world. All the senses are discussed, with a focus on vision and audition. Computer based exercises will be assigned in which students will simulate and explore how certain perceptual phenomena occur. Knowledge of computer programming is NOT required as there will be a short tutorial introducing relevant computer science concepts.
Open to students grades 9 through 12
Maximum Size: 20
Sun 3:00pm–5:00pm

S2441: Introduction to Quantum Mechanics
David Farhi
You've probably heard a lot about quantum mechanics - something about wave-particle dualities, cats being dead and alive, and lots of other things that don't quite make sense. In this class we'll develop quantum mechanics from the beginning, and try to make sense of all these strange notions. We'll start with some experimental observations, and try to explain them. Along the way, we'll meet Schrodinger's Equation, superposition, wavefunction collapse, quantized energy levels, and more.

You will absolutely need to know calculus for this class. You should be comfortable with derivatives and integrals, and if you've seen some simple differential equations, that can't hurt.

"Those who are not shocked when they first come across quantum theory cannot possibly have understood it." -Niels Bohr
Open to students grades 9 through 12
Maximum Size: 22
Sun 3:00pm–5:00pm