

# Course Catalog — *Arts*

## **A537: Music without the Octave: Wendy Carlos's Unique "Scales"** Sat 12:00pm–2:50pm

*Dianna Lauroesch*

The octave may be the most fundamental relationship in (Western) music. Yet, what happens if we remove it?

Wendy Carlos, composer and electronic musician, wondered what would be the optimal spaces between notes if we valued the thirds and fifth rather than the octave. From this exploration she found 3 "scales" simply labeled as Alpha, Beta, and Gamma, which have far more in tune thirds and fifths than our system, yet no octave!

We'll take a brief stroll through music history to see how we got to this point, look at how these relationships are determined, then see what we may do when thrown into a musical system different from our own.

*Open to students grades 9 through 12*

**Sat 10:00am–11:50am**

## **A497: Intro to Bollywood Dance**

*Sonal Rangnekar*

Bollywood dance is a style that draws from classical Indian dance, folk dance, hip hop, and Western dance. In this class, students will learn a short piece to a song from an Indian movie. The moves will be simple and fun to allow students from all types of backgrounds and abilities to participate. After the class, you'll get a video of your performance, which you can continue to perfect and perform for your family and friends!

*Open to students grades 9 through 12*

**Sat 11:00am–11:50am**

## **A533: Fiction Writing: How to Write Compelling Characters**

*Abeje Schnake*

Do you love writing? Do you want to write fiction but don't know where to start? This course is an introduction to fiction writing focusing on how to craft characters that push your story forward and that an audience will fall in love with! We will discuss character development, how character drives narrative, and what makes a good protagonist. There will be writing time and a prompt, in addition to a lesson.

*Open to students grades 9 through 12*

**Sat 12:00pm–12:50pm**

## **A541: Graphic Novels**

*Sascha Deng*

In this class, we will read and analyze short graphic novels, and create our own short graphic novels as a final project.

*Open to students grades 9 through 11*

## **A538: Indian Dance**

*Deepabali Dasgupta*

Sharpen your creativity through rhythmic footwork, body movements, facial expressions and effortless grace. Get the flavor of the diverse Indian culture through the art of storytelling in Dance.

*Open to students grades 10 through 12*

**Sat 12:00pm–12:50pm**

**Sat 1:00pm–1:50pm**

## **A519: The Innate Puzzles of Music Theory: For musicians and non-musicians alike**

*Steven Wilke*

Have you ever wondered what the mysterious world of "music theory" is all about? Are you interested in learning what "Cdim7#9" really means? Then join me as I take you through the different puzzles of music theory and explain how we got to where we are today! I will also leave plenty of time for any questions you may have about college, North-western, or music.

*Open to students grades 9 through 12*

**Sat 12:00pm–12:50pm**

**Sat 1:00pm–1:50pm**

## **A536: Introduction To Graphic Design**

*Alexander Lai*

Do you want to create better designs for t-shirts or logos? Join me as I go through the fundamentals of design and go through a streamlined example of the design process - from drafting ideas all the way to creating them on the computer!

*Open to students grades 9 through 12*

**Sat 1:00pm–1:50pm**

**Sat 2:00pm–2:50pm**

## **A510: The Harp**

*Amy Shlyak*

Do you like music? Do you play an instrument? Want to learn about a new one? I have been playing music my whole life and have been playing harp for 4 years. I will teach you about how the harp works in general, harp basics, and how to potentially write music for the harp (e.g. techniques used when playing). I will do demos and answer any questions you have. Come learn about the harp with me!

*Open to students grades 9 through 12*

**Sat 2:00pm–2:50pm**

# Course Catalog — *Engineering*

## **E531: Idea Workshop: Getting Started With Arduino**

*Petras Swissler*

Want to make a robot? A pet food dispenser? A candy sorter?

The best way to learn a new skill is to apply it. This class will focus on introducing you to what you can do with an Arduino and how to get started.

Tentative learning plan: After learning some of the basics behind how to use an Arduino, we will learn about motors, servos, and sensors, then plan out a project and then share and discuss.

*Open to students grades 9 through 12*

**Sat 10:00am–10:50am**

**Sat 11:00am–11:50am**

## **E502: Taking Out the Trash: The Journey of Last Night's Dinner from Your Home to the Environment**

*Olivia Barber*

Where does all the trash go? It's probably a question you haven't thought about, but that is exactly why it is so amazing. We often don't see or even think about what happens to all the waste we make even though we each create huge amount every day. The journey of our trash (and recycling) from our home, to the disposal facility and onwards varies worldwide. With concerns about climate change rising, what role does waste disposal play in global climate and what options are there for more sustainable disposal?

The course will be a brief overview of the history of trash, differences between countries, how we transport trash from our house to disposal, different options for disposal (landfills v.s. incineration etc.), and what these mean for climate change.

*Open to students grades 9 through 12*

**Sat 10:00am–10:50am**

**Sat 2:00pm–2:50pm**

## **E529: Bionic Limbs: How do they Work?**

*Maggie Swerdloff*

Have you ever wondered how prosthetic limbs, such as a bionic leg or arm, can be controlled to do what the user wants on command?

In this class you'll learn all about state-of-the-art bionic limbs and how we can use neural signals to control them.

Students of all grade levels are welcome. No prior knowledge is necessary to understand the material in this class.

*Open to students grades 9 through 12*

**Sat 11:00am–11:50am**

**Sat 12:00pm–12:50pm**

**Sat 1:00pm–1:50pm**

## **E508: Intro to Engineering**

*Paige Hendersen*

Have you always wondered what engineers actually do? What are the differences between different fields of engineering? Are you interested in solving problems by using math, design, technology, art, or all of the above? Then you've come to the right place! This 50 minute course will introduce you to all different types of engineering fields, the specific interests and skills that are helpful in these fields, what an engineer does in their day-to-to job, and how to succeed as a creative problem-solver. As a mechanical engineer myself, who had no idea what an engineer was in high school, I've come a long way and would love to share more about my personal journey and answer any questions you may have. For anyone remotely interested in pursuing engineering studies in high school or college, this will be a great overview that hopefully gets you excited about your incredible potential as a future creative problem-solver.

*Open to students grades 9 through 12*

**Sat 12:00pm–12:50pm**

**Sat 1:00pm–1:50pm**

**Sat 2:00pm–2:50pm**

# Course Catalog — *Humanities*

## **H506: Chernobyl and the Consequences of Secrecy**

*Paul Brown*

Enjoyed HBO's "Chernobyl" miniseries as a pandemic binge? In this course we will learn more about what actually happened, what the causes were, and examine the fallout of the disaster (literal and political). In essence, we will use the Chernobyl nuclear disaster as a case study for the scientific, political, and human costs of administrative secrecy and corruption.

*Open to students grades 9 through 12*

**Sat 10:00am–10:50am**

**Sat 11:00am–11:50am**

## **H517: Introduction to Navigating the Courtroom: Hands on Learning For Future Pre-Law students**

*Shreya Chimpiri*

To get what you want, you got to be able to fight for it. Whether it be a multi-million dollar business deal, a decade long fight for custody, or a crucial decision about whether to lock someone up for the rest of their days, being a good debater is an invaluable skill to win the high risk, high reward cases that lawyers are presented with everyday.

Come be a part of TWO engaging courtroom simulations where you'll get the chance to work as part of a legal defense team and create an argument on your own about topics on the docket right now. Think you have what it takes to be the next big lawyer?

*Open to students grades 9 through 12*

**Sat 10:00am–11:50am**

**Sat 1:00pm–2:50pm**

## **H521: Political Philosophy: Let's Start a Government!**

*Kenni Zellner*

This class will teach you about perhaps the most important text in contemporary political philosophy: John Rawls A Theory of Justice. In the beginning of this book, Rawls sets up a special procedure that is supposed to guarantee that the folks who get together to start a government will design a society that everybody will find fair. Briefly, the procedure requires that the participants go behind a Veil of Ignorance for their deliberations. When you're behind the Veil of Ignorance, you know nothing about yourself, your friends and family, or your preferences. Rawls believes that if the folks trying to set up a government are robbed of this information, then whatever society they set up will be fair for anybody who ends up in that society.

The goal of this class is to investigate Rawls theory is the Veil of Ignorance a good way to achieve a just society? but also to test it out! In this class, we will put ourselves behind the Veil of Ignorance and see what kind of government we think would be fair for a society to adopt. Then we will compare our results to Rawls.

I recommend this course for anyone who has anything to say

about politics!

*Open to students grades 9 through 12*

**Sat 10:00am–11:50am**

**Sat 1:00pm–2:50pm**

## **H544: The Euthyphro Dilemma: Learning to Read Plato and Why**

*Ethan Lipka*

Alfred North Whitehead once said, The safest general characterization of the European philosophical tradition is that it consists of a series of footnotes to Plato. The first time you hear this quote you scoff, and think, he must be overstating the dude. At least, I thought that before my first political theory course, but the more political theory you read, the more you'll see just how extraordinarily influential he has been on our thinking, even today. While the translations of his work are excellent, to really understand him requires learning context about the ways in which he said what he said and why. In this class, we will go over the Euthyphro to understand one of the first known arguments against religious government, how to read Plato, see why he's important, and see how he can be problematic as well.

*Open to students grades 9 through 12*

**Sat 10:00am–10:50am**

**Sat 12:00pm–12:50pm**

**Sat 1:00pm–1:50pm**

## **H525: Philosophical Fiction**

*Natalie Smith*

Why do many of the most enduring works of fiction dedicate themselves to exploring life's most profound and challenging questions, and what do we gain from seeking to understand them? This course is an introduction to philosophical fiction, a category attributed to works who substantively explore some facet of the human condition. We will discuss why it is important to examine philosophy through the lens of fiction and why the influence of these stories had persisted across generations.

*Open to students grades 9 through 12*

**Sat 11:00am–11:50am**

**Sat 12:00pm–12:50pm**

## **H499: Borges and The Multiverse: Dark Energy in The Garden of Forking Paths**

*Laurisa Sastoque*

This course will look at Argentinian writer Borges' "The Garden of Forking Paths" and will create an interdisciplinary analysis of the Theory of the Multiverse in the narrative. Through explanation of both scientific and literary devices, we will come to understand how Borges identifies the relationship between dark energy and time.

*Open to students grades 9 through 12*

**Sat 12:00pm–12:50pm**

**Sat 1:00pm–1:50pm**

**Sat 2:00pm–2:50pm**

**H501: Word Evolution: How Biology and Linguistics are More Alike than You Might Think***David Bushhouse*

Organisms and languages both evolve over time, because they both have to survive, adapt to new environments, and reproduce. This course will introduce some of the basic principles of biological and linguistic evolution, with lots of fun examples. Guaranteed to make you the boring person telling word facts at parties.

*Open to students grades 9 through 12***Sat 12:00pm–12:50pm****H511: Backyard Shipwrecks***Emily Schwalbe*

This class will explore the shipwrecks of Lake Michigan using the approaches of an underwater archaeologist. Students will investigate the shipwrecks of Chicagos lake, learn about waterborne travel, and utilize archaeological methods to dive into local history.

*Open to students grades 9 through 12***Sat 1:00pm–2:50pm**

# Course Catalog — *Math & Computer Science*

## **M500: How to Lose Money On The Internet: Political Statistics and Prediction Markets**

*Tom Sheridan*

In this course, we will go over the basics of probability and statistics and how they apply to polling and prediction markets. At the end, there will be a demonstration of how prediction markets work and a challenge to make the most money possible given a certain budget and risk.

*Open to students grades 9 through 12*

**Sat 10:00am–10:50am**

**Sat 12:00pm–12:50pm**

## **M513: Using Data Science to win at Fantasy Football**

*Alex Cates*

Fantasy Football is an extremely popular data driven game. And while many players rely on knowledge of real world football, there are ways to supplement your knowledge and ability by using statistics and data science. In this course we will cover the basics of how to source and process data that can be useful when making your fantasy football decisions

*Open to students grades 9 through 12*

**Sat 11:00am–11:50am**

## **M509: Hilbert's Hotel and Comparing Infinities (plus some weird properties of large prime numbers)**

*John B. Stroud*

Did you know that some values of infinity are bigger than others? We will use David Hilbert's illustration of an infinitely large hotel to discuss how to think about unbounded numbers. Time permitting, we will then pivot to discussing very large prime numbers and some of their unusual properties.

*Open to students grades 10 through 12*

**Sat 2:00pm–2:50pm**

## **M545: Towards Building Machines That Think and Learn like Humans**

*Kathy Garcia*

An introductory course and exploration on the facets of recreating human intelligence in artificial systems through guiding principles in neuroscience, cognitive science, and artificial intelligence.

Limitations, progress, and emerging methods will be discussed.

*Open to students grades 11 through 12*

**Sat 2:00pm–2:50pm**

# Course Catalog — *Miscellaneous*

## **X498: Design for Equity**

*Grace Wickerson*

Youth must be stakeholders in the re-design of our existing systems. Young people are fully immersed in the problems relevant to their communities brought on by COVID-19 but are not engaged as meaningful participants in addressing those challenges because of their age. This class will discuss how to identify a systemic challenge and rapidly devise a strategy to collectively address this problem with communities.

*Open to students grades 9 through 12*

**Sat 10:00am–10:50am**

**Sat 11:00am–11:50am**

**Sat 1:00pm–1:50pm**

## **X505: Intro to Positive Psychology with Journaling**

*Anushree Natraj*

In this class, you will learn about the science behind positive psychology and how you can use it in your daily life with extremely simple, quick, yet powerful tools such as journaling and reflection.

You will learn some fundamental tools to take control of your mindset and plan out your goals. Ultimately, this class aims to leave you with a set of ideas to understand yourself better so that you can uplift your mindset and take goals to the next level.

*Open to students grades 9 through 12*

**Sat 10:00am–11:50am**

## **X532: Let's Get Glowing - Makeup 101**

*Lucky Nanduri*

This is a basic course on makeup! All are welcome. We will discuss topics such as:

- What is primer and why is it important?
- Ways to apply foundation
- How concealer/contour/bronzer work
- How to have fun and express yourself with makeup!

It will be similar to an art class where I will show you all how I do my makeup and talk through the whole routine and you all can decide your own interpretation on my look and recreate it!

*Open to students grades 9 through 12*

**Sat 10:00am–10:50am**

**Sat 11:00am–11:50am**

## **X524: Fall Vegetarian Cooking**

*Kate Christian*

Feeling inspired by the changing leaves? Curious how to cook fall vegetables in a creative way? Want to learn vegetarian /

plant based recipes? Welcome to class!

In this class we'll make a delicious, flavorful autumn-inspired dish and learn some basic cooking skills and tips.

And don't worry about specialty ingredients everything we use can be found at grocery stores this time of year.

*Open to students grades 9 through 12*

**Sat 11:00am–12:50pm**

## **X514: Cooking 101: French Toast!**

*Ann Herman, Michelle Kraus*

In this class we will be making french toast! You will need:

8 slices of bread: your choice of bread (can be challah, brioche or white bread, etc.)

1/4 cup of milk

1/2 cup of maple syrup

4 eggs

1/2 teaspoon of vanilla extract

1 teaspoon of cinnamon

2 tablespoons of sugar

Extras:

Strawberries, or other fruit

1/4 teaspoon of nutmeg

Whipped cream

Equipment:

Mixing bowl

Measuring cups and spoons

Whisk

Pan

Spatula

*Open to students grades 9 through 12*

**Sat 12:00pm–12:50pm**

**Sat 1:00pm–1:50pm**

## **X540: Basics of Okinawan Karate**

*Christopher Mead*

Students through this 50 min class will learn the first basic punch and kick of Isshinryu karate, a style of Okinawan karate. A brief presentation on the history of Isshinryu will be given to help students contextualize the techniques they will learn. This class will not require much free space, however please be sure you have enough room to throw a kick while standing in place.

*Open to students grades 9 through 12*

**Sat 2:00pm–2:50pm**

# Course Catalog — *Science*

## **S530: A Day in the Field as a Primatologist**

*Tabor Whitney*

Learn about animal behavior by observing videos of Chimpanzees. Ask biological anthropologists how they ended up in their fields and more about what primatology is. Conservation of endangered primates is essential and this course will open you up to the world of conservation and you can learn more about your closest living relative.

*Open to students grades 9 through 12*

**Sat 10:00am–10:50am**

**Sat 11:00am–11:50am**

## **S522: How to Breathe Underwater**

*Nina Munoz*

Open your eyes to another world right in your own backyard. This course is taught by a professional divemaster and is broken into four parts: (1) The amazing history of scuba diving; (2) The physiology of scuba diving; (3) talking to fish; and (4) saving the ocean. This class will change the way you look at the world, and hopefully will inspire you to do more learning of your own!

*Open to students grades 9 through 12*

**Sat 10:00am–10:50am**

**Sat 11:00am–11:50am**

## **S528: Introduction to Clinical Trials**

*Kara Ferracuti*

In light of the ongoing COVID-19 pandemic, you've probably heard about clinical trials in the news lately. But clinical trials are nothing new; they've been conducted long before COVID-19 and are invaluable to the development of new treatments. This class will provide an introduction to clinical trials, with a focus on cancer. What does it take to get approval from the U.S. Food and Drug Administration for an experimental drug? What are the phases of a trial? We will then delve into some interesting questions related to the conduct of clinical trials. Topics may include: How does research differ from clinical practice? How do patients consent to participate in a clinical trial? How are they protected? What kind of oversight and regulations are there? Who pays for the costs of a clinical trial? Finally, you will have the opportunity to learn and ask questions about what its like to work in this industry. What else can you do besides being a doctor? How do clinical research professionals in various roles work together to support medical advances?

*Open to students grades 9 through 12*

**Sat 10:00am–10:50am**

**Sat 1:00pm–1:50pm**

**Sat 2:00pm–2:50pm**

## **S523: Mythbusters - Climate Change Edition: Fact or Fiction**

*Colleen O'Brien*

There is a lot of information about climate change out there, but not all of it is true.

In this class we will debunk some common myths about climate change and brainstorm solutions to address the impacts of climate change here in Chicago.

*Open to students grades 9 through 11*

**Sat 10:00am–10:50am**

**Sat 11:00am–11:50am**

**Sat 12:00pm–12:50pm**

## **S503: The Standard Model of Particle Physics (without any complicated math)**

*Michael McGinnis*

The Standard Model is our current best theory on the universe at the smallest scale. In this class, I will present the particles and interactions of the Standard Model, including the Higgs Boson. I hope to present these topics in a way that is accessible to people with basic physics and chemistry experience and without any unapproachable math.

*Open to students grades 11 through 12*

**Sat 10:00am–11:50am**

**Sat 1:00pm–2:50pm**

## **S518: Who Done It - An Introduction to Forensic Science**

*Chloe Chow*

How do forensic scientists figure out what happened at a crime scene from looking at the evidence? What are the ways that this interpretation fails?

We will be learning about the different modes of forensic analysis, from fingerprinting to weapons analysis to fiber analysis, and how they can be used to solve a crime. Through the examination of a mock crime scene, we will attempt to solve a "murder" by applying forensic skills to a problem. We will also learn about the failures of forensic analysis in how they are applied in the American justice system.

*Open to students grades 9 through 12*

**Sat 10:00am–11:50am**

**Sat 1:00pm–2:50pm**

## **S512: Who's Really the Strongest Incredible? Superhero Physics (and Why it Matters)**

*Saahir Ganti-Agrawal*

Superhero stories, whether they are from comics, books, movies, or TV shows, are an awesome way to use our imagination. In this course, I am going to go through some ways of wrapping our heads around our favorite super people using physics. Our goal will be to show how the power of physics brings life to superpowers, and how the physics of superheroes might even be important for our daily lives. (inspiration from "The Physics of Superheroes" by James Kakalios and "What If?" by Randall Munroe).

*Open to students grades 9 through 12*

**Sat 10:00am–10:50am**

**S520: At Home Chemistry: Studying Surfaces using Contact Angles***Catherine Walker*

How do physical chemists study surfaces? One technique for understanding the characteristics of liquids and surfaces is measuring how they interact. In this course, you'll learn how to measure the contact angles formed by droplets on surfaces and what this information can tell you. This is a technique used in chemistry research today, and you'll learn how to do it in your own kitchen!

*Open to students grades 9 through 12***Sat 11:00am–11:50am****Sat 1:00pm–1:50pm****S516: Biomimicry***Brian Vogt*

Biomimicry is the study of nature to figure design and inspire new inventions from based on the nature around us. The course will start by introducing the topic to the students and providing real world examples of biomimicry. The students will then be presented with a challenge in which they will be asked to come up with a solution inspired by nature.

*Open to students grades 9 through 12***Sat 12:00pm–12:50pm****S542: Do You Want It or Do You Like It? Intro to Reward and Motivation***Gabriela Lopez*

What is reward? What motivates us? Why can't I stop taking cookies from the cookie jar? Take an introductory dive into how the brain encodes reward and motivation. Learn about how motivation impacts learning and behavior.

*Open to students grades 9 through 12***Sat 12:00pm–12:50pm****S507: Evolutionary Oddities***Nicolas Daffern*

What connects whale feet, nylon munching bacteria, and our own broken sense of smell? The theory of evolution! It is a popular topic these days and lots of people have something to say about whether or not they think it makes sense. But life itself also has something to say about its past and what it has to say is very strange. In this course we look at many of the biological oddities that suggest that evolution explains the diversity, and weirdness, of life.

*Open to students grades 9 through 12***Sat 12:00pm–12:50pm****Sat 1:00pm–1:50pm****S504: Introduction to NASA Missions***Victoria Woodburn*

Do you want to learn more about some awesome NASA missions? This course will teach you all about some of the upcoming NASA science and spaceflight missions, including CREW 1, OSIRIS-REx and Mars Perseverance! Come learn more about our universe!

*Open to students grades 9 through 12***Sat 12:00pm–12:50pm****Sat 1:00pm–1:50pm****Sat 2:00pm–2:50pm****S527: Nature's Origami! An Introduction to Protein Folding***Radhika Dalal*

Proteins are molecules that are important for all kinds of processes in your body, from digesting the food you eat to repairing cuts on your skin. Scientists all around the world have been asking questions about proteins for years to understand how they function. An interesting topic we will talk about in this class is how different combinations of protein building blocks (called amino acids) can create different shapes of proteins through a process called protein folding. We will learn about protein folding and how the shape of a protein can affect its function.

*Open to students grades 9 through 12***Sat 12:00pm–12:50pm****Sat 1:00pm–1:50pm****S543: The Physics of Rick and Morty***Zhiheng Sheng*

Have you seen the sci-fi animated series Rick and Morty? Have you thought about the science in the show? We are going to talk about some of the concepts proposed in the show and their validity: parallel universes, portals, spaceships, you name it. Is it possible that we'll one day develop the technology they have? Let's find out!

*Open to students grades 9 through 12***Sat 12:00pm–12:50pm****S534: What's that made of? A Tour of The Periodic Table***Zach Ladwig*

"Conquering matter is to understand it, and understanding matter is necessary to understanding the universe and ourselves: and that therefore Mendeleev's Periodic Table, which just during those weeks we were learning to unravel, was poetry." - Primo Levi

In this class we will go on a tour of the periodic table, identifying the classes of elements which exist and the specific ones which make up the things we use and see everyday.

*Open to students grades 9 through 12***Sat 1:00pm–1:50pm****Sat 2:00pm–2:50pm****S526: S499 - Biohacking – Optimizing your body using science***Fred Feng, Mujtaba Najeed*

Fats, carbohydrates and proteins are integral components to proper functioning of the body. However, by altering our intake of these components, we can configure our bodies for greater performance, whether that's concentrating for longer periods of time, achieving a higher quality of sleep or enjoying greater overall physical wellbeing. In this course, we will cover the mechanics and effects of how nutrition, supplements, dieting, physical activity and sleep affect our bodies.



*Open to students grades 9 through 12*

**Sat 2:00pm–2:50pm**