

2019 Summer Program Grades 4-12 Northwestern's Evanston Campus

Please visit our website (<https://www.ctd.northwestern.edu/>) for our course search tool, as well complete information about our residential and commuter programs, tuition pricing for 2019, and how to apply. **Application opens January 2, 2019**, and courses are filled on a rolling basis. Call 847/467-3782 for more information!

The Summer Program on Northwestern's campus offers students a wide array of rigorous, exciting coursework at both the Advanced Enrichment levels (for grades 4-8), and the Accelerated level (for grades 6-12). Students take a single course in the subject area of strength during their time on campus. Coursework is complimented by a rich activities program in the afternoon for Commuter students who wish to participate, and a supportive, fun, and personal-growth oriented residential program for those who wish to live on campus. Staffed by master instructors, well qualified teaching assistants, and experienced residential staff, a summer with CTD is one students never forget.

2019 Dates

Grades 4-6

June 30 – July 12, 2019*

July 14 – July 26, 2019

July 28 – August 9, 2019

Grades 6-12

June 30 – July 19, 2019*

July 21 – August 9, 2019

*On July 4, classes will flip curriculum for all students.

Location

Courses are held on Northwestern's Evanston Campus. Biology courses are hosted at beautiful Roycemore School in Evanston in order to provide appropriate lab access.

Tuition

Grades 4-6 two-week Solstice program

- Commuter: \$1595
- Residential Tuition: \$2835

Grades 6-12 three-week Spectrum & Equinox programs

- Commuter: \$2335
- Residential Tuition: \$3985
- Partnership Classes (Equinox SustainableXDesign & iOT Engineering with Windy City Labs)
 - Commuter: \$3750
 - Residential: \$5350
- AP Chemistry (5 week course)
 - Commuter: \$3015
 - Residential: \$5665

Application

Visit my.ctd.northwestern.edu to begin your application!

Grades 4-6 Solstice Program

The Solstice program offers students completing grades 4-6 **Advanced Enrichment Courses**. Meeting for two weeks in a full-day format, these fast-paced, rigorous, non-credit courses are designed to allow students to explore specialized subjects in depth. Supported by our master instructors and teaching assistants in the classroom, and by a dedicated residential staff during afternoon activities and during our residential program, students experience campus life in a safe and fun environment.

To apply for advanced enrichment, follow the eligibility requirements for *Emerald Tier* as outlined in each course or subject area description.

Advanced Enrichment Courses

Session 1 June 30 – July 12, 2019 <i>(flipped/remote class July 4)</i>	Session 2 July 14 – July 26, 2019	Session 3 July 28 – August 9, 2019
Science of Fiction	Call to Adventure: Making a Hero	Novel Engineering
Creative Writing: Short Story	Creative Writing: Next Chapter	Branding You®
Ambassadors in Action	Debate & Discourse: Current Events	Debate & Discourse: Current Events
Devising & Directing	Building A Mystery	Order in the Courtroom: The Law Through Fable & Fairy Tale Trials
War Games: Revolution	War Games: World War	War Games: The Golden Age of Pirates
Caution! High Voltage	Robotics: Some Assembly Required	Art 360: Engineering Objects
Minecraft	Minecraft	MIDI Mania: Computer Music & Composition
App Lab	Python Programming: From Games to Google	Python Programming: From Games to Google
Machine Physics	Designing Machines That Work: Engineering & Physics	Machine Physics
Intro to Genetics	Searching the Abyss: Living without Light	Brain Science
Colonizing the Cosmos	Aerospace Engineering & The Science of Flight	How to Make Time Fly
Day Zero: When Water Runs Out	Chem Lab: It's Elemental	Detective Science: Introduction to Forensics
Luck of the Draw: Math Puzzles & Games	Big League Analytics	Out of Bounds: The Space of Sports
Solving for X	Real World Math	Solving for X

ENGLISH & LANGUAGE ARTS

ADMISSION CRITERIA:

PSAT 8/9 OR ≥ 90 th national percentile rank in verbal or reading on standardized achievement test OR Admission Portfolio

The Science of Fiction

What goes into a successful Polyjuice potion? How might a broomstick take flight? Could civilization exist underground? Through inquiry, discussion, and experimentation, explore the science behind the fictional worlds of *Harry Potter*, *A Wrinkle in Time*, *When You Reach Me*, *Zita the Spacegirl*, *City of Ember*, and more.

NOTES:

- A laptop or tablet with keyboard is required for this course.
 - This course is Coughlin STEM Scholars eligible.
- OFFERED: June 30 - July 12, 2019

Creative Writing: Short Story

In this writing workshop, channel your creative ideas into polished short stories. Analyze professional writing techniques, practice writing and revising, and present work to an audience. Combining elements of great storytelling and the short fiction form, create your own portfolio to take home.

NOTE: A laptop or tablet with keyboard is required for this course.

OFFERED: June 30 - July 12, 2019

Creative Writing: The Next Chapter

From developing ideas to completing final chapters, the process of writing a novel can be exciting and daunting. Study successful novels and plot a course for writing your own pieces. Daily peer critiques and revision workshops are utilized to tap into your creativity, and practice the focus and diligence necessary to complete a novel.

NOTE: A laptop or tablet with keyboard is required for this course.

OFFERED: July 14 - July 26, 2019

Call to Adventure: Making a Hero

Come explore legends that have persisted through generations to answer the question, "What makes a story timeless?" Follow the hero's journey through classic and modern narratives and craft an original hero. Analyze and dissect themes that run through stories from Greek mythology to J.R.R. Tolkien to the Star Wars Universe and DC Comics®, as you come to understand the connections between ancient and current storytelling conventions.

NOTE: A laptop or tablet with keyboard is highly recommended for this course.

OFFERED: July 14 - July 26, 2019

Updated Favorite! Branding You®

Unleash your creative instincts in Branding You®, where you'll learn the entrepreneurship skills to become a content creator of digital media. Through writing, photography and film projects, discover how to make media on issues that matter to you while developing your own personal brand and gaining followers. Discover how visual elements and hashtags make an impact on stories going viral, all while collaborating with your peers to propose, script, and develop your own Youtube series.

NOTES:

- A tablet with a keyboard and photo-taking capability, or laptop computer is required for this course.
- If a laptop is the student's preferred technology, a smartphone with a built-in camera is required and video capability is required.

OFFERED: July 28 - August 9, 2019

Novel Engineering

What does a Quidditch field look like? What would the shipwrecked Swiss Family Robinson need to keep in mind as they designed their new home? In this arts-integrated literature course, read fiction selections and imagine being an engineer who can impact the narrative by designing environments to extend the stories. Projects involve creative writing, drawing, and constructing three-dimensional structures.

NOTE:

- A laptop or tablet with keyboard is required for this course.
 - This course is Coughlin STEM Scholars eligible.
- OFFERED: July 28 - August 9, 2019

ARTS, SOCIAL SCIENCES & HUMANITIES

ADMISSION CRITERIA:

PSAT 8/9 OR ≥ 90 th national percentile rank in verbal or reading on standardized achievement test OR Admission Portfolio

NEW! Devising & Directing

Have you been crafting a script at home and want to learn how to bring it to life? In this collaborative course, you'll work with an ensemble to devise a new show from first inspiration to final bows. Through improvisation exercises, develop confidence in your acting skills while learning effective directing and staging techniques. Improve your writing, directing, and performance skills through daily critique sessions. Workshop, direct and perform an original piece written with your newly formed ensemble.

OFFERED: June 30 - July 12, 2019

Ambassadors in Action

Learn the art of diplomacy in our study of the United Nations. While acting as a delegate of a nation, analyze how countries are shaped and how international relationships evolve as the world changes. Research and understand the UN's organization and structure, and examine current challenges the UN faces. Serving as an ambassador at a mock Security Council session, advocate for your country's positions, and sharpen your research, writing and speaking skills.

NOTE: *A laptop or tablet with keyboard is required for this course.*

OFFERED: June 30 - July 12, 2019

NEW! Building a Mystery

The recent explosion of augmented reality games and escape rooms demonstrate that humans crave the pleasure of solving a good mystery. In this class, study how storytellers and game masters build the "player one" experience for mysteries and escape room sequences. Interrogate the conventions of the genre by reading the greats like Arthur Conan Doyle and Blue Balliett. Become the puzzle master as you use your new skills to plot thrilling narratives and craft an interactive mystery experience.

NOTE: *Additional \$100 materials fee required.*

OFFERED: July 14 - July 26, 2019

Debate & Discourse: Current Events

Learn the art of public speaking and debate as you sharpen your presentation skills, refine your arguments, and broaden your thinking. Research positions on current issues, and learn to present your ideas effectively by exploring different debate styles and analyzing professional debates.

NOTE: *A laptop or tablet with keyboard is required for this course.*

OFFERED: July 14 - July 26, 2019 & July 28 – August 9, 2019

Order in the Courtroom

Through the lenses of law, literature, and improvisation, explore the moral dilemmas at the core of traditional tales. Is Jack guilty of manslaughter? Does Rumpelstiltskin deserve a pile of gold for breach of contract? A mix of speaking and writing activities prepares you to take on the roles of lawyer, witness, juror, and storyteller. Develop advanced skills in oral argument, moral reasoning, mediation, conflict resolution, and the classic art of great storytelling.

OFFERED: July 28 - August 9, 2019

Student Favorites – War Games Series

War Games: Revolution

In this simulation and game-based course, you won't just learn about history, you'll play it out. Examine key turning points that led citizens to revolt by taking on

the perspective of important historical figures. Play out key decisions, consider the impact of potential strategies, and analyze primary and secondary sources to uncover personal and political motivations. Apply your knowledge through the design of a revolutionary board game.

NOTE: *A laptop or tablet with keyboard is required for this course.*

OFFERED: June 30 - July 12, 2019

War Games: World War

In the second of our original *War Games* series, take the opportunity to dive into turning points that led to world war by playing them out in a series of strategy games. Take on the roles of important historical figures, consider potential alliances, analyze strategies, and play out the results. By analyzing primary and secondary sources, you will discover how military decisions impact civilian life. Apply your learning to design and create the rules for a strategy game of your own.

NOTE: *A laptop or tablet with keyboard is required for this course.*

OFFERED: July 14 - July 26, 2019

NEW! War Games: The Golden Age of Pirates

In the third in our popular *War Games* series, come explore early territories and experience peril at sea. Following trade routes from the 15th through the 18th centuries, uncover the strategies of buccaneers and the government galleons and privateers who fought against them. From the pirates of the Caribbean Islands to the corsairs of the Mediterranean Sea, analyze strategies, plot new courses for trade, and play out the results. Apply your learning to design and create the rules for a strategy game of your own.

NOTE: *A laptop or tablet with keyboard is required for this course.*

OFFERED: July 28 - August 9, 2019

SCIENCE

ADMISSION CRITERIA:

PSAT 8/9 OR ≥ 90th national percentile rank on standardized achievement test (see course descriptions for qualifying subject area) OR Admission Portfolio

NEW! Day Zero: When Water Runs Out

The planet's need for water is increasingly compounded by its scarcity. Internationally, the summer of 2019 could bring Day Zero to Cape Town, when water taps will run dry across the city. Locally, Michigan has the second most water of any state in the U.S, but families in Flint lack access to clean water in their homes. Investigate the water supply by

asking critical questions, testing water sources and outputs, and proposing a solution to a water problem of your choice. Get your feet wet in multiple disciplines as you look at water through different lenses.

NOTE: *This course is Coughlin STEM Scholars eligible.*

QUALIFYING SCORE: *Verbal/Reading*

OFFERED: June 30 - July 12, 2019

Colonizing the Cosmos

Imagine NASA wanted YOU to live on Mars. Are you ready to launch? Investigate the red planet, exploring the scientific and technological advancements NASA is developing to make travel to Mars a reality. By researching current real-world projects that are preparing humans for off-world colonization, you will develop and propose your own plans for survival in space.

NOTE: *This course is Coughlin STEM Scholars eligible.*

QUALIFYING SCORE: *Verbal/Reading*

OFFERED: June 30 - July 12, 2019

Introduction to Genetics

What does it mean when someone says, “it’s in the genes?” Genes determine the color of our eyes and hair, our height, and our predisposition to certain illnesses. Learn how genes and DNA determine individual traits, discuss advances in the field (including the Human Genome Project), and consider the ethical, legal, and medical issues involved in genetic modification.

NOTES:

- *Additional \$100 lab & materials fee required.*
- *This course uses classroom and laboratory space at Roycemore School.*
- *This course is Coughlin STEM Scholars eligible.*

QUALIFYING SCORE: *Verbal/Reading*

OFFERED: June 30 - July 12, 2019

Machine Physics

Put your engineering ingenuity to the test in this hands-on introduction to physics. Working collaboratively on building projects, explore physics concepts such as force, acceleration, potential and kinetic energy, and torque, and apply them to machines of your invention. This class is a great participatory experience for students interested in Science Olympiad events.

NOTE:

- *Additional \$100 materials fee required.*
- *This course is Coughlin STEM Scholars eligible.*

QUALIFYING SCORE: *Math*

OFFERED: June 30 - July 12, 2019 & July 28 - August 9, 2019

Designing Machines that Work: Engineering & Physics

How do engineers create modern marvels like the Channel Tunnel, The Three Gorges Dam, or the Millay Viaduct, and what physics principles were utilized in designing them? In this STEAM course, learn the fundamentals of high school physics and investigate engineering concepts by applying advanced math, the conservation of energy, and Newton’s laws of gravity and motion. Using these tools, design, construct, and test engineering projects.

NOTES:

- *Additional \$100 materials fee required.*
- *This course is Coughlin STEM Scholars eligible.*

QUALIFYING SCORE: *Math*

OFFERED: July 14 - July 26, 2019

Aerospace Engineering & The Science of Flight

How do the fundamental forces of flight work to get a giant machine off the ground? Apply the principles of aerodynamics to your own designs, including kites, hot air balloons, gliders, and rockets. Learn about the history of flight, and through hands-on experiments, create hypotheses, observe your flying machines, and compose lab reports to understand the physics principles behind the science. Apply the engineering process as you become an aeronautical engineer.

NOTES:

- *Additional \$100 materials fee required.*
- *This course is Coughlin STEM Scholars eligible.*

QUALIFYING SCORE: *Math*

OFFERED: July 14 - July 26, 2019

NEW! Searching the Abyss: Living without Light

The oceans encompass 99% of all of the living space for organisms on Earth, and more than 85% of this space is in the dark. Study how life survives the depths and discover what exploring the deepest places on earth can teach us about survival in extreme environments. The methods of cryptozoology will come in handy as you dive into what’s known and unknown about the monsters big and small who call the abyss home.

NOTES:

- *Additional \$100 lab & materials fee required.*
- *This course uses classroom and laboratory space at Roycemore School.*
- *This course is Coughlin STEM Scholars eligible.*

QUALIFYING SCORE: *Verbal/Reading*

OFFERED: July 14 - July 26, 2019

Chem Lab: It’s Elemental

You may know what happens when you combine baking soda and vinegar, but have you ever seen a gummy bear dance with potassium chlorate? Discover how chemistry explains—and impacts—the world around us and learn about core subjects

including atomic weight and structure, acids and bases, stoichiometry, and chemical bonding. Working in a laboratory setting, learn to design experiments, evaluate results, and construct lab reports.

NOTES:

- Additional \$100 lab & materials fee required.
- This course is Coughlin STEM Scholars eligible.

QUALIFYING SCORE: Math

OFFERED: July 14 - July 26, 2019

NEW! How to Make Time Fly

Can you imagine a world without time? Much of our daily experience, our view of the world, and our knowledge of the farthest places in the universe, is shaped by our understanding (and measurement) of time. This course explores the physics of time, aging, and how people use time to make sense of their world. Discuss time-based popular culture as you debate the possibility and ethics of time travel. Learn scientific theories about time and develop your own time measurement device.

NOTE: This course is Coughlin STEM Scholars eligible.

QUALIFYING SCORE: Math

OFFERED: July 28 - August 9, 2019

Brain Science

Discover the secrets of “the most complex thing in the universe”: your own brain, a three-pound mass of miles of nerve fibers that controls everything you do and how you react to the world. Learn how the brain impacts your decisions, controls how memory works, influences your mood, and more in this mind-blowing course!

NOTES:

- Additional \$100 lab & materials fee required.
- This course uses classroom and laboratory space at Roycemore School.
- This course is Coughlin STEM Scholars eligible.

QUALIFYING SCORE: Verbal/Reading

OFFERED: July 28 - August 9, 2019

Detective Science: Introduction to Forensics

“It is a capital mistake to theorize before one has data. Insensibly one begins to twist facts to suit theories, instead of theories to suit facts.” This was a guiding philosophy of Sherlock Holmes. Learn the forensic science involved in solving crimes, including how to collect fingerprints, crack secret codes, and examine evidence. Topics from life science, psychology, literary analysis, and physical science are combined to create, write and solve complex mysteries.

NOTES:

- Additional \$100 lab and materials fee required.
- This course is Coughlin STEM Scholars eligible.

QUALIFYING SCORE: Reading/Verbal

OFFERED: July 28 - August 9, 2019

TECHNOLOGY, COMPUTER SCIENCE & ENGINEERING

ADMISSION CRITERIA:

PSAT 8/9 OR ≥ 90th national percentile rank in verbal/reading, in quantitative or math on standardized achievement test OR Admission Portfolio

NEW! Caution! High Voltage

How does an electric circuit work and how do machines generate energy? Discover the principles of voltage, currents, and resistance in this electrifying new course. Using hands-on construction skills, learn how to open and close circuits in order to build an electronic device of your own design. Research how energy is produced and distributed, and consider the mechanics of alternate energy sources.

NOTES:

- Additional \$100 lab and materials fee required.
- This course is Coughlin STEM Scholars eligible.

OFFERED: June 30 - July 12, 2019

Updated Favorite! App Lab

From Facebook to Angry Birds, mobile applications are used every day. In this project-based course, you'll participate in hands-on games and dev-shop team building exercises, as well as learn programming concepts and gain proficiency in drag-and-drop computer programming interfaces in order to develop, program, and test an android app.

NOTES:

- Students are encouraged to bring a personal Android device (such as a tablet or smart phone), but it is not required.
- Additional \$100 lab and materials fee required.
- This course is Coughlin STEM Scholars eligible, and for the Sandra Dennhardt Scholarship.

OFFERED: June 30 - July 12, 2019

Minecraft

Join classmates in a secure Minecraft world for unique design challenges. Build societies and systems, plan treasure hunts, and use Minecraft to gain deeper knowledge of traditional academic content areas, including math (spatial reasoning, geometry), sociology (city planning, societal structures), and science (geology, circuitry). Previous experience with Minecraft is helpful, but not necessary.

NOTES:

- Additional \$100 materials fee required.
- Students are required to bring a laptop computer for use in the course.
- This course is Coughlin STEM Scholars eligible.

OFFERED: June 30 - July 12, 2019 & July 14 – July 26, 2019

Robotics: Some Assembly Required

Have you always wanted a robot to do your chores? Are you fascinated by smart technology? Learn the mechanical construction of sensors, motors, and gears, and control strategies to make robots perform tasks. Using LEGO® Mindstorms EV3, work in teams to design, build, and program robots that walk, talk, and roll. Discover the basic principles of engineering, hone your programming skills, and test your creativity.

NOTES:

- *Additional \$100 materials fee is required.*
- *This course is Coughlin STEM Scholars eligible.*

OFFERED: July 14 - July 26, 2019

NEW! Art 360: Engineering Objects

What goes into making and installing a successful sculpture like Chicago's beloved *Bean*? In what ways are artists engineers and engineers artists? Study the intersection between 3D design and the principles of engineering as you discover how masters of installations like Christo and Jean Claude, Alexander Calder, and Claes Oldenburg work with the terrain to achieve their goals. Change the landscape of Northwestern with a three-dimensional object of your team's design.

NOTES:

- *Additional \$100 materials fee required.*
- *This course is Coughlin STEM Scholars eligible.*

OFFERED: July 28 - August 9, 2019

Python Programming: From Games to Google

Python is a powerful programming language used to drive the Google search engine, YouTube, and applications at NASA. It has also been used to build many popular computer games. Python teaches the fundamentals of object-oriented programming, which can be applied to other languages like Java and C++. Learn to create Python scripts that use expressions, variables, conditionals, loops, lists, dictionaries, functions, and objects. Gain facility with the language through interactive learning environments that helps you build your own computer games.

NOTES:

- *Students are required to bring a laptop computer for use in the course.*
- *This course is Coughlin STEM Scholars eligible, and for the Sandra Dennhardt Scholarship.*

OFFERED: July 14 - July 26, 2019 & July 28 – August 9, 2019

MIDI Mania: Computer Music & Composition

Drop the bass! Learn how musicians, producers, and DJs use technology and programming to create the music you hear every day. Create your own music

using a variety of electronic production suites and applying the basic principles of music theory. Whether an avid listener or an experienced performer, advance your skills with cutting-edge technology.

NOTES:

- *Students are required to bring a laptop computer for use in the course.*
- *Additional \$100 materials fee required.*
- *This course is Coughlin STEM Scholars eligible.*

OFFERED: July 28 - August 9, 2019

MATHEMATICS

ADMISSION CRITERIA:

PSAT 8/9 OR ≥ 90th national percentile rank in quantitative or math on standardized achievement test OR Admission Portfolio

Updated Favorite! Luck of the Draw: Math, Puzzles & Games

Step right up! Learn and apply critical math topics through games of skill and luck including chess, KenKen and Sudoku, and carnival games of chance. Concepts come from algebra and geometry and include an exploration of probability and statistics. Apply the concepts of risk analysis, expected value, and outcomes to create your own game and predict the success of the players!

NOTE: *This course is Coughlin STEM Scholars eligible.*

OFFERED: June 30 - July 12, 2019

Updated Favorite! Solving For X

This introduction to Pre-Algebra surveys topics such as properties of rational numbers, algebraic equations, ratio, proportion, percent, exponents and radicals, inequalities, the coordinate plane, areas and volumes, probability, and statistics. This course is intended for students who want a preview of Pre-Algebra for future study.

NOTE: *This course is Coughlin STEM Scholars eligible.*

OFFERED: June 30 - July 12, 2019 & July 28 – August 9, 2019

NEW! Big League Analytics

Running a successful sports team involves serious math. How do managers decide which players to start each game? How do sports fanatics use stats to draft fantasy leagues? In this data analytics class, students will learn how to use statistics to measure a player's performance over time and debate the merits of "scouts vs. stats" as they create their own dream team.

NOTE: *This course is Coughlin STEM Scholars eligible.*

OFFERED: July 14 - July 26, 2019

Real-World Math

Paper or plastic, financial markets, population growth...real-world issues big and small are understood and addressed through math! Learn to apply exponents, percentages, multi-step equations, and more to devise solutions for some of the most complicated issues facing the planet.

NOTE: *This course is Coughlin STEM Scholars eligible.*

OFFERED: July 14 - July 26, 2019

Updated Favorite! Out of Bounds: The Space of Sports

What do athletics and architecture have in common? Geometry! Play with geometric concepts, including angles, patterns, similarity, congruence and curved shapes, and discover their connection to gameplay, as well as how sports stadiums are designed for both the athletes and the spectators. Gain spatial sense as well as a solid understanding of geometric principles as you tackle the boundaries of sports and stadiums in this project-based course.

NOTE: *This course is Coughlin STEM Scholars eligible.*

OFFERED: July 28 - August 9, 2019

Grades 6-8*

Spectrum Program

*Students in grade 9 are eligible to apply and will be considered on a case-by-case basis.

The Spectrum program offers two types of courses, outlined below. Supported by our master instructors and teaching assistants in the classroom, and by a dedicated residential staff during afternoon activities and the residential program, students experience campus life in a safe and fun environment.

Advanced Enrichment Courses are fast-paced, rigorous, non-credit courses designed to allow students to explore specialized subjects in depth. To apply for advanced enrichment, follow the eligibility requirements for *Magenta Tier* as outlined in each course or subject area description.

Advanced Enrichment Courses

Session 1: June 30 – July 19, 2019 <i>(flipped/remote class July 4)</i>	Session 2: July 21 – August 9, 2019
Imagining the Multiverse: FanFiction Workshop	Scare Quotes: Horror Fiction
Cold Open: Crafting Political Comedy	Short Play Generator with the Neo-Futurists
This is America: Popular Music & History	Competition Math
Open Source Science	Forensic Science
FUSE Studio Design Challenges	FUSE Studio Design Challenges
Taking Action: Leadership & Service	Taking Action: Leadership & Service

Accelerated Courses are compacted high school courses designed to help students accelerate in a particular subject area. These courses are typically offered for one or two semesters of credit through Center for Talent Development. To apply for accelerated courses, follow the eligibility requirements for *Indigo Tier* as outlined in each course or subject area description.

Accelerated Courses

Session 1: June 30 – July 19, 2019 <i>(flipped/remote class July 4)</i>	Session 2: July 21 – August 9, 2019
Creative Writing Workshop	Creative Writing Workshop
Literary Analysis: AI & the Ethics of Machines	Research Writing Workshop: Evil Genius
Human Rights & US Foreign Policy	Non-Fiction Writing Workshop
Persuasion & Debate	Persuasion & Debate
Brain & Behavior: Introduction to Psychology	Brain & Behavior: Introduction to Psychology
The Supremes: Judges & Judgments	Crossing Over: Population & Migration
Market Crashers: Disruptors & Innovators	Bubbles & Crashes: Introduction to Economics
Fundamental Physics Honors	Physics First Honors
Topics in Chemistry Honors	Topics in Chemistry Honors

**** see next page for more courses ****

Session 1: June 30 – July 19, 2019 (cont.)	Session 2: July 21 – August 9, 2019 (cont.)
Introduction to Biomedicine	Introduction to Biomedicine
Biology Honors	Biology Honors
Significant Figures: Data Science Honors	Electronic Digital Instruments
Java Programming	Java Programming
Camera-Ready Graphic Design	Advanced Java Programming
VEX® Robotics	VEX® Robotics
Financial Algebra	C++ Programming
Pre-Algebra Honors	Pre-Algebra Honors
Algebra I Honors	Algebra I Honors
Algebra II/Trig Honors	Algebra II/Trig Honors
Geometry Honors	Geometry Honors

ADVANCED ENRICHMENT COURSES

While not credit-bearing, the Summer Program's grades 6-8 Advanced Enrichment courses are rigorous, fast-paced, and cover high school level content. They are designed to engage students in a specialized, often interdisciplinary topic of interest and to allow in-depth study while applying critical and creative thinking skills. These courses are designated as *Magenta Tier* for eligibility.

ENGLISH & LANGUAGE ARTS

ADMISSION CRITERIA

- ≥ 95 th national percentile rank in verbal or reading on grade-level standardized achievement test (e.g. NWEA/MAP) OR
- SAT® OR ACT® (taken above-grade-level in grade 7 or 8) OR
- PSAT™ 8/9 (taken above-grade-level in grade 5 or 6) OR
- Admission Portfolio

Imagining the Multiverse: Fanfiction Workshop

Let your imagination run wild and hone your writing skills by taking the reins of established fictional universes. Learn how to expand upon your favorite stories by diving deep into characters' psyches, and combine separate worlds into something truly new. A piece ready for publication serves as the capstone project.

OFFERED: June 30 - July 19, 2019

NEW! Scare Quotes: Horror Fiction

There's more to a good fright than guts and gore. Consider the roles of psychology, metaphor, and other literary devices in crafting a truly horrifying scare as you study texts from Bram Stoker, HP Lovecraft, Mary Shelley, Stephen King, and many more. As a final project, write an original horror story ready for publication.

OFFERED: July 21 - August 9, 2019

ARTS, SOCIAL SCIENCES & HUMANITIES

ADMISSION CRITERIA

- ≥ 95 th national percentile rank in verbal or reading on grade-level standardized achievement test (e.g. NWEA/MAP) OR
- SAT® OR ACT® (taken above-grade-level in grade 7 or 8) OR
- PSAT™ 8/9 (taken above-grade-level in grade 5 or 6) OR
- Admission Portfolio

Cold Open: Crafting Political Comedy

"It's CTD Night Live!" Future Kate McKinnons and John Oliver's will examine the relationship between comedy and current events in a writers' room format, and learn to synthesize individual perspectives and senses of humor into a single, coherent perspective. As a culminating project, the final week of the course will resemble the production process at Saturday Night Live as students pitch, write, rehearse, and produce an original political comedy show focusing on the news of the week.

OFFERED: June 30 - July 19, 2019

NEW! This is America: Popular Music & History

From spirituals to Spotify, trace the history of American popular music alongside the historical events that shaped it. Study the social, cultural, and economic factors that inform the blues, jazz, rock, hip-hop, and more, and craft original lyrics and music in multiple styles. As a final project, write the history of the last five years of popular music as a musicologist would, and explore how current events and trends have shaped the songs you listen to everyday.

OFFERED: June 30 - July 19, 2019

NEW! Short Play Generator with the Neo-Futurists

Every week since 1988, the Neo-Futurists ensemble generates between two and twelve stage ready-plays, performed in the order determined by a live audience. In this exciting course, you will become part of a performance ensemble by writing, directing and performing plays at an accelerated pace. Through daily writing and performance workshops led by members of the Neos, learn impactful staging techniques and experience a professional rehearsal process as you prepare original short plays for performance!

NOTE: *Additional \$125 lab fee required.*

OFFERED: July 21 - August 9, 2019

SCIENCE

ADMISSION CRITERIA

- \geq 95th national percentile rank in verbal or reading on grade-level standardized achievement test (e.g. NWEA/MAP) OR
- SAT® OR ACT® (taken above-grade-level in grade 7 or 8) OR
- PSAT™ 8/9 (taken above-grade-level in grade 5 or 6) OR
- Admission Portfolio

UPDATED FAVORITE! Open Source Science

Science doesn't stop at the laboratory's edge. Discover how researchers, science advocates, and everyday citizens turn research into practical

application through political advocacy; participate in open-source research projects; distinguish between science and pseudo-science; and practice science writing outside the standard lab report format. Conversations with officials from Northwestern University and the City of Evanston will supplement this wide-ranging investigation of the most pressing scientific issues.

NOTE: *This course is Coughlin STEM Scholars eligible.*

OFFERED: June 30 - July 19, 2019

Forensic Science

Forensic Science examines the relationship between science and the criminal justice system through mini-lectures, in-class discussion, and hands-on activities. Collect, preserve, and analyze crime scene evidence to solve whodunits. Labs include trace analyses of hair, fiber, stain, epithelial cells, fingerprints, and DNA. This class is an excellent prelude to future science and laboratory coursework.

NOTES:

- *Additional \$125 lab fee required.*
- *This course is Coughlin STEM Scholars eligible.*

OFFERED: July 21 - August 9, 2019

TECHNOLOGY, COMPUTER SCIENCE & ENGINEERING

ADMISSION CRITERIA

- \geq 95th national percentile rank in verbal/reading or math on grade-level standardized achievement test (e.g. NWEA/MAP) OR
- SAT® OR ACT® (taken above-grade-level in grade 7 or 8) OR
- PSAT™ 8/9 (taken above-grade-level in grade 5 or 6) OR
- Admission Portfolio

FUSE Studio Design Challenges

Complete design challenges developed by Northwestern University and develop problem solving, creativity, and persistence skills. Projects span diverse fields such as electronics, robotics, biotechnology, architecture, sound mixing, and fashion design. With the help of an expert facilitator, use STEAM-based practices to produce and present artifacts for peer review, remixing, and expert feedback.

NOTES:

- *Additional \$125 materials fee required.*
- *Laptop computer required.*
- *This course is Coughlin STEM Scholars eligible.*

OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

MATHEMATICS

ADMISSION CRITERIA

- ≥ 95 th national percentile rank in math on grade-level standardized achievement test (e.g. NWEA/MAP) OR
- SAT® OR ACT® (taken above-grade-level in grade 7 or 8) OR
- PSAT™ 8/9 (taken above-grade-level in grade 5 or 6) OR
- Admission Portfolio

Competition Math

Do you participate in MATHCOUNTS® or have an interest in competition-based problem solving? Competition Math will introduce you to the concepts and techniques of applied math and solving competition math puzzles and prepare you for national math contests such as AMC, the Art of Problem Solving, and others. The course will tackle problems in the major areas of competition math—algebra, geometry, number theory, counting, and probability—and is ideal for students who enjoy math and solving challenging problems.

NOTE: This course is Coughlin STEM Scholars eligible.

OFFERED: July 21 - August 9, 2019

LEADERSHIP & SERVICE

ADMISSION CRITERIA

- ≥ 95 th national percentile rank in verbal or reading on grade-level standardized achievement test (e.g. NWEA/MAP) OR
- SAT® OR ACT® (taken above-grade-level in grade 7 or 8) OR
- PSAT™ 8/9 (taken above-grade-level in grade 5 or 6) OR
- Admission Portfolio

Taking Action: Leadership & Service

Each year, three million Americans experience homelessness, 15 million go hungry, and one in five children lives in poverty. What can young people do about it? An offering of CTD's Civic Education Project, Taking Action integrates academic study with meaningful community service. Divide time between the classroom and supervised hands-on service projects with community organizations such as homeless shelters, Head Start programs, and political offices. This course enhances communication, critical thinking, and problem-solving abilities and prepares you for a lifetime of leadership and civic engagement.

NOTE: Additional \$125 field study fee required. This course is restricted to current 7th & 8th graders.

OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

ACCELERATED COURSES

Spectrum's Accelerated courses are rigorous, fast-paced, graded courses taught at the high-school honors level. Students complete a single semester or full academic year's worth of curriculum in three weeks. These courses are designated as *Indigo Tier* for eligibility.

ENGLISH & LANGUAGE ARTS

ADMISSION CRITERIA:

- PSAT 8/9 R ≥ 24 OR EBRW ≥ 480 OR
- SAT R ≥ 28 OR EBRW ≥ 550 OR
- ACT R ≥ 22 OR
- Admission Portfolio

Creative Writing Workshop

PREREQUISITE: Graded writing assignment

This course encourages developing writers to employ craft to creative advantage in genres such as fiction, poetry, and short story. Topics and inspiration are gathered from a variety of sources and activities such as writing prompts, open discussions, and field trips. Explore and apply the elements of effective writing through focused academic exercises, peer group response, literary analysis, and instruction in craft. Develop a number of creative pieces for a portfolio reflecting your growth as both a writer and thinker.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

UPDATED FAVORITE! Literary Analysis: AI & the Ethics of Machines

PREREQUISITE: Graded writing assignment

From the ancient Greeks on, authors have explored the ethical dilemmas of artificial intelligence. Through close readings, lively debates, and writing activities, examine what it means to be intelligent, to have a mind, and the implications of creating "intelligent" machines. Readings may include Greek myth; authors such as Mary Shelley, Isaac Asimov, Arthur C. Clarke, and Terry Pratchett; and scientific articles. This course is great preparation for high school, the critical reading and writing sections of the SAT, and the English and Reading sections of the ACT.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019

Research Writing Workshop: Evil Genius

PREREQUISITE: Graded writing assignment

It's not easy being the bad guy! Hone your research and writing skills as you look for patterns in the criminal behavior of literature's most famous villains. What motivates them, how do they convince others to join their side, what leads to their undoing, and how are they brought to justice? Students apply reading in philosophy, history, and criminology to assert their position on the nature of evil, and create a brand-new villain informed by their research.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: July 21 - August 9, 2019

Non-Fiction Writing Workshop

PREREQUISITE: Graded writing assignment

From ads to blogs to columns, we read an astonishing amount of non-fiction every day. Learn about audience, purpose, point of view, and more in this course that develops skills for producing informational texts of all types, using a range of models in a project-based learning environment. Focus on informative/explanatory, procedural/how-to, persuasive, nonfiction narrative, and biographical forms. This class is great preparation for advanced high school writing and AP® English courses.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: July 21 - August 9, 2019

ARTS, SOCIAL SCIENCES & HUMANITIES

ADMISSION CRITERIA:

- PSAT 8/9 R ≥24 OR EBRW ≥480 OR
- SAT R ≥28 OR EBRW ≥550 OR
- ACT R ≥22 OR
- Admission Portfolio

NEW! The Supremes: Judges & Judgements

The Supreme Court has been at the center of recent, divisive debates in American culture, including corporate rights, digital privacy, travel bans, and more. In this course, learn how Justices are appointed, how the Court functions, how it reaches its decisions, and how Justices have approached interpretive issues. Students will examine some of the Court's landmark cases; notable interactions and relationships between Justices, both friendly and strained; and the political struggle for control of the Bench. As a capstone, argue a case in front of your peers in a moot court.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019

NEW! Market Crashers: Disruptors & Innovators

Whether Wikipedia supplanting encyclopedias or streaming video bankrupting Blockbuster®, the

modern world is shaped by faster and faster disruptions to institutions and industries. Study the history of disruption from the printing press to modern companies like Uber® and Rent the Runway®, and create an original, industrial-strength disruptor based on market research and data. Hear from Chicago-area industry-shakers and gain professional insight into making your concept a reality.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019

Human Rights & Foreign Policy

In this introduction to foreign policy issues, analyze means of international cooperation such as economic globalization, international legal frameworks, environmental agreements, and diplomacy. Study issues of civil conflict, national security, and human rights in the context of contemporary global topics such as the challenges in the Middle East, emerging economies, and climate change. Readings and discussions are complemented by guest presentations, field trips, and structured writing experiences to hone critical-thinking and persuasive-writing abilities.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019

Persuasion & Debate

Learn the principles and practices of effective communication in a variety of speaking situations encountered in school and later in life as an adult. Examine pressing social issues and develop skills in public speaking, argumentation, and writing through lectures and discussions, reflective writing, persuasive essays, speeches, and structured debates. Upon completion, you are prepared for advanced study in honors English, humanities, and the social sciences, and are ready to participate in various forms of competitive debate.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

Brain & Behavior: Introduction to Psychology

Learn exactly why people do what they do through study of the structures and functions of the brain and nervous system; the relationship between brain activity and action; and the role of biological, environmental, social, and individual factors in psychological experience. Examine key theories, experiments, and individuals in the field of psychology through dynamic lectures, group activities, debates, and hands-on projects to gain a better understanding of scientific research and psychological thought. This course is an excellent introduction to behavioral science or advanced-level psychology courses.

HIGH SCHOOL CREDIT OFFERED: 1 semester

OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

NEW! Crossing Over: Population & Migration

As more humans cross more borders in search of better futures, the debate over immigration rages in the United States and abroad. Do countries have an obligation to welcome migrants? Do immigrants have an obligation to assimilate into their new home culture? What is the definition of a "citizen" in the twenty-first century? How will the climate crisis affect immigration? Explore these questions and more while examining the regions at the center of the debate. This course is excellent preparation for AP® Human Geography.

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: July 21 - August 9, 2019

Bubbles & Crashes: Introduction to Economics

Can you spot a stock market bubble before it pops? How do decisions by governments, businesses, and individuals affect markets? Budding economists examine economic booms and busts of the past and present, focusing on concepts such as risk, supply and demand, marginal utility, and the fundamentals of investing. This course builds critical-thinking skills through discussion and writing experiences and is ideal for those interested in future study of economics, political science, international relations, or other advanced social sciences.

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: July 21 - August 9, 2019

SCIENCE

ADMISSION CRITERIA: *Varies by course; please note the requirements for each course below.*

For Fundamental Physics Honors: Force & Motion; Physics First Honors; and Topics in Chemistry Honors:

- PSAT 8/9 R ≥ 24 + M ≥ 450
- SAT R ≥ 28 + SAT M ≥ 550 OR
- ACT R ≥ 22 + ACT M ≥ 22 OR ACT S ≥ 23 OR
- Admission Portfolio

For Introduction to Biomedicine and Biology Honors:

- PSAT 8/9 R ≥ 24
- SAT R ≥ 28 OR
- ACT R ≥ 22 OR ACT S ≥ 23 OR
- Admission Portfolio

Fundamental Physics Honors: Force & Motion

PREREQUISITE: Pre-Algebra

From subatomic particles to galaxies and stars, force is fundamental to physics. Explore a variety of

fascinating phenomena in the physical world and the way physics explains the motion of objects, including electrons in an electrical circuit, roller coasters, planets, the light that we use to see, and the sounds we hear. Hands-on lab exercises complement the course material and allow for the derivation of important physics concepts. This course is excellent preparation for Physics Honors.

NOTES:

- A scientific or graphing calculator is required.
- Additional \$125 lab fee required.
- This course is Coughlin STEM Scholars eligible.

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: June 30 - July 19, 2019

Physics First Honors

PREREQUISITE: Algebra I

Build a strong conceptual understanding of physical principles ranging from force and motion to classical mechanics. This course is a full-year physics curriculum course intended for students who attend schools with a Physics First science sequence and plan to accelerate through the high school science curriculum. Students who plan to take Physics at their academic year school are encouraged to take Fundamental Physics Honors. Physics First Honors prepares students for more advanced physics topics and AP® Physics.

NOTES:

- A scientific or graphing calculator is required.
- Additional \$125 lab fee required.
- This course is restricted to current 7th and 8th graders.
- This course is Coughlin STEM Scholars eligible.

HIGH SCHOOL CREDIT OFFERED: 2 semesters
 OFFERED: July 21 - August 9, 2019

Topics in Chemistry Honors

PREREQUISITE: Algebra I

Through laboratory experiments, explore the chemistry found in everyday surroundings, including atomic theory, stoichiometry, chemical reactions, intermolecular forces, periodic trends, and acids and bases. Explore concepts, adjust variables independently, apply proper lab technique, and use your findings to determine next steps. This inquiry-based course provides a foundation for advanced studies in chemistry.

NOTES:

- A scientific or graphing calculator is required.
- Additional \$125 lab fee required.
- This course is Coughlin STEM Scholars eligible.

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

Introduction to Biomedicine

Explore groundbreaking medical research, gain insights into the body's molecular and cellular processes, and learn how that knowledge is applied to medical practice and treatments. Get acquainted with topics in chemistry by examining essential biochemical reactions that occur in the body, learn about physics while investigating biomechanics, and explore biology at the cellular level. This course is an excellent introduction to the study of medicine or advanced laboratory courses.

NOTES:

- *Additional \$125 lab fee required.*
- *This course uses classroom and laboratory space at Roycemore School.*
- *This course is Coughlin STEM Scholars eligible.*

HIGH SCHOOL CREDIT OFFERED: 1 semester

OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

Biology Honors

PREREQUISITE: Completion of a laboratory science course

Biology comes alive in this fast-paced high school honors course, emphasizing the principles that apply to plants and animals through class discussion, text readings, demonstrations, and applying methods of scientific investigation in the lab. Biology Honors is a full-year course in an accelerated format designed for students who intend to accelerate in science, and prepares students for AP® Biology. Students who plan to take biology at their academic-year school are encouraged to enroll in Introduction to Biomedicine Honors or one of our Physics or Chemistry courses.

NOTES:

- *Additional \$150 lab fee required.*
- *This course is restricted to current 7th and 8th graders.*
- *This course uses classroom and laboratory space at Roycemore School.*
- *This course is Coughlin STEM Scholars eligible.*

HIGH SCHOOL CREDIT OFFERED: 2 semesters

OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

TECHNOLOGY, COMPUTER SCIENCE & ENGINEERING

ADMISSION CRITERIA: *Varies by course; please note the requirements for each course below.*

For Java Programming; Advanced Java; C++ Programming; Electronic Digital Instruments; and VEX® Robotics:

- *PSAT 8/9 M ≥450 OR R ≥24 OR*
- *SAT M ≥550 OR R ≥28 OR*

- *ACT M ≥22 OR ACT R >22 OR*
- *Admission Portfolio*

For Significant Figures: Data Science Honors:

- *PSAT 8/9 M ≥450 OR*
- *SAT M ≥550 OR*
- *ACT M ≥22 OR*
- *Admission Portfolio*

For Camera Ready Graphic Design:

- *PSAT 8/9 R ≥24 OR*
- *SAT R ≥28 OR*
- *ACT R ≥22 OR*
- *Admission Portfolio*

Significant Figures: Data Science Honors

PREREQUISITE: Algebra I

Big Data can illuminate everything from politics to sports, and provide predictions for both news analysts and citizens. Surveying theories of probability, learn how to turn data into algorithms for making better decisions. Individual research projects will find students collecting, analyzing, and applying data toward proposals for action.

NOTE:

- *A laptop computer (not a tablet) is required for this course.*
- *This course is Coughlin STEM Scholars eligible.*

HIGH SCHOOL CREDIT OFFERED: 1 semester

OFFERED: June 30 - July 19, 2019

Java Programming

PREREQUISITES: Pre-Algebra AND demonstrated experience in one programming language

In the Greenfoot programming environment, employ sophisticated data structures and coding strategies to create games and applications. Explore foundational programming concepts applicable to other coding languages and use the Net-Beans programming environment to develop and publish math-oriented applications. This class prepares you to take more advanced programming courses, including C++ Programming and AP® Computer Science A.

NOTES:

- *A laptop computer (not a tablet) is required for this course.*
- *This course is Coughlin STEM Scholars eligible, and for the Sandra Dennhardt Technology Scholarship.*

HIGH SCHOOL CREDIT OFFERED: 1 semester

OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

NEW! Advanced Java Programming

PREREQUISITES: Pre-Algebra & Java Programming

Looking to take your Java code further? This course will emphasize dynamic data-structures, object-

oriented programming, and computationally complex concepts such as generics and exceptions. Apply your new skills to a substantial, original final project.

NOTES:

- *A laptop computer (not a tablet) is required for this course.*
- *This course is Coughlin STEM Scholars eligible, and for the Sandra Dennhardt Technology Scholarship.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: July 21 - August 9, 2019

VEX® Robotics

PREREQUISITE: Pre-Algebra AND demonstrated experience in one programming language

Using VEX EDR®, a robotics system consisting of modular hardware, sensors, and programming software, collaborate to create custom machines that execute tasks in a battle of creativity, design, and execution. This course provides exposure to contemporary examples of robotics technology and pressing questions raised by their application. Used in the world-famous FIRST® Tech and Robotics challenges, VEX® robotics teaches students engineering, design, build, and collaborative skills crucial in emerging design and engineering careers.

NOTE:

- *Additional \$150 materials fee required.*
- *This course is Coughlin STEM Scholars eligible.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

NEW! Electronic Digital Instruments

PREREQUISITE: Pre-Algebra AND demonstrated experience in one programming language

The first digital instruments were expensive, gigantic, and only considered suitable for "experiments" by avant-garde composers. Fifty years later, digital instruments fit in the palm of your hand and are the backbone of popular music. Using Novation Launchpad Controllers, learn to manipulate audio in Ableton Live and create digital music of your own, while studying the history of computer music and the science behind your tracks.

NOTES:

- *A laptop computer (not a tablet) is required for this course.*
- *This course is Coughlin STEM Scholars eligible.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: July 21 - August 9, 2019

C++ Programming

PREREQUISITE: Algebra I AND demonstrated experience in one programming language

Key concepts in C++ include problem solving, design strategies and methodologies, algorithms, inheritance,

polymorphism, encapsulation, common data structures, and the class-object relationship. In addition to learning the language of C++ and writing original code, engage in discussion of the ethical and social implications of programming, from the hacker culture of the 1960s to today's open source movement.

NOTES:

- *A laptop computer (not a tablet) is required for this course.*
- *This course is Coughlin STEM Scholars eligible, and for the Sandra Dennhardt Technology Scholarship.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: July 21 - August 9, 2019

Camera Ready Graphic Design

Through a series of real-world exercises and hands-on studio sessions using Adobe Illustrator, Photoshop, and Adobe InDesign, build a foundation for print, online, and multi-platform visual communication, and explore the fundamental elements of visual communication from typography to branding. Complementing the technical portion of the course, daily sketchbook activities, readings on design history, contemporary design, and global brand awareness, field trips, films, and readings will illuminate the challenges faced by twenty-first-century designers.

NOTES:

- *Additional \$125 lab fee required.*
- *A laptop computer (not a tablet) is required for this course.*
- *This course is Coughlin STEM Scholars eligible.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: June 30 - July 19, 2019

MATHEMATICS

ADMISSION CRITERIA:

- *PSAT 8/9 M ≥450 OR*
- *SAT M ≥550 OR*
- *ACT M ≥22 OR*
- *Admission Portfolio*

NOTE: *A graphing calculator is required for all mathematics courses.*

NEW! Financial Algebra

PREREQUISITE: Pre-Algebra

In the time it takes you to read this description, you could be a hundred dollars richer. Apply concepts from Algebra I and Algebra II directly to your financial life and learn how your money can make money through the study of the stock market & investing, personal credit, banking, retirement planning, and

more. As a final project, devise an in-depth financial plan for your "dream life," taking into account everything from cost-of-living to salary ranges for dream jobs.

NOTE: *This course is Coughlin STEM Scholars eligible.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019

Pre-Algebra Honors

Pre-Algebra Honors covers a yearlong pre-algebra curriculum, including traditional topics such as properties of rational numbers, algebraic equations, geometric figures, ratio, proportion, percent, exponents and radicals, inequalities, the coordinate plane, areas and volumes, probability, and statistics. This course is designed for accelerated math students who are looking to take Algebra I in the fall. Students completing Pre-Algebra are prepared for Algebra I and Java programming courses.

NOTE: *This course is Coughlin STEM Scholars eligible.*

CREDIT OFFERED: *While this course is graded, it is not typically given for high school credit. This is a two semester, Pre-Algebra course and will be documented in evaluations as such.*

OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

Algebra I Honors

PREREQUISITE: *Pre-Algebra*

Algebra I Honors covers properties of real numbers; solving and graphing linear equations, functions, and linear inequalities; exponents and exponential functions; polynomials and factoring; quadratic equations and functions; radicals and geometry connections; and rational equations and functions. Algebra I Honors is a full-year course intended for students who have already studied the introductory

ideas of algebra (Pre-Algebra) and plan to accelerate in their district's math sequence.

NOTE: *This course is Coughlin STEM Scholars eligible.*

HIGH SCHOOL CREDIT OFFERED: 2 semesters
OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

Algebra II & Trigonometry Honors

PREREQUISITE: *Algebra I*

Algebra II & Trigonometry Honors covers systems, equations, polynomial arithmetic, complex numbers, solutions of quadratic equations, exponential and logarithmic functions, sequences, series, graphs of polynomial functions, conic sections, and concepts in trigonometry. Algebra II & Trigonometry Honors is a full-year high school course intended for students who plan to accelerate in their district's math sequence.

NOTE: *This course is Coughlin STEM Scholars eligible.*

HIGH SCHOOL CREDIT OFFERED: 2 semesters
OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

Geometry Honors

PREREQUISITE: *Algebra I*

Geometry Honors covers formal proofs, logic and deductive reasoning, constructions, congruence and similarity, parallels and perpendiculars, polygons and circles, transformations and problem solving using advanced technology. Geometry Honors is a full-year high school course intended for students who plan to accelerate in their district's math sequence.

NOTE: *This course is Coughlin STEM Scholars eligible.*

HIGH SCHOOL CREDIT OFFERED: 2 semesters
OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

Grades 9-12 Equinox Program

Equinox accelerated courses provide a rigorous, fast-paced, & supportive learning community for academically advanced students in grades 9 through 12. Students earn high school credit for advanced high school and college-level subjects through CTD. Students take a single course that meets five-and-a-half hours per day, five days per week.

Most courses are three weeks in length; the two exceptions are the LaunchX partnership at 4 weeks (additionally, note that LaunchX is a residential only program), and AP® Chemistry at 5 weeks. Attendance to all the weeks of these two courses is required. To apply for accelerated courses, follow the eligibility requirements for *Indigo Tier* as outlined in each course or subject area description.

ACCELERATED COURSES

Session 1: June 30 – July 19, 2019 <i>(flipped/remote class July 4)</i>	Session 2: July 21 – August 9, 2019
Creative Writing Seminar	Creative Writing Master Class
Sound Bite Storytelling	Screenwriting Seminar
Composition & Rhetoric	Critical Discourse: Introduction to Ethics
Science of Right & Wrong	AP® Psychology
Economics of Everything	International Relations
Cancer Biology & the Promise of Immunotherapy	Human Anatomy & Physiology
Neuroscience Seminar	Biotech Lab
Chemistry Honors	Chemistry Honors
Physics Honors	Physics Honors
Quantum Mechanics & Relativity	SustainableXDesign 2019 with CAC
IoT Engineering with Windy City Lab	Mechatronics: Electro-Mechanical Design with McCormick School of Engineering
AP® Computer Science A	AP® Computer Science A
iOS Bootcamp & Swift Development with MobileMakersEdu	Hello Kotlin: Android App Bootcamp
Foundations & Frontiers in Mathematics	Creating Knowledge: Data by Design
Algebra II & Trigonometry Honors	Algebra II & Trigonometry Honors
Pre-Calculus Honors	Pre-Calculus Honors
AP® Statistics	AP® Calculus AB
4 Week Session: June 30 – July 26, 2019	
Venture Innovation Lab with LaunchX <i>(Residential Only)</i>	
5 Week Session: June 30 – August 2, 2019	
AP® Chemistry	

ENGLISH & LANGUAGE ARTS

ADMISSION CRITERIA:

- *Above-grade-level Tests: (taken in or before the 9th grade year): SAT R ≥ 28 OR SAT EBRW ≥ 550 OR ACT R ≥ 22*
- *On-level Tests: (taken in the 10th or 11th grade year): SAT EBRW ≥ 700 OR ACT R ≥ 32*
- *If test scores are not available, or do not meet the criteria, students are welcome to apply via Admission Portfolio.*

Creative Writing Seminar

PREREQUISITE: Graded writing sample, preferably creative writing

In this foundation course, students refine critical reading and creative writing skills through discussion of contemporary literature and extensive writing output, focusing on revision. Developing skill with sentence and narrative structure, imagery, cadence, voice and dialogue, students work across genres, including poetry, fiction, and creative nonfiction. Students receive feedback in a workshop format, and produce a final portfolio of original work.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019

Creative Writing Master Class

PREREQUISITES: Graded creative writing sample AND one year of high school English (previous writing workshop experience preferred)

Designed for students with considerable experience in creative writing, this course pairs adventurous reading with prodigious writing across genres, including poetry, fiction, and creative nonfiction. Advance skills in imagery, voice, setting, character, and narrative. Practice daily reading and writing, peer review and revision, and focus output in a preferred genre. Develop a portfolio of serious original work ready for publication.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: July 21 - August 9, 2019

NEW! Sound Bite Storytelling

PREREQUISITE: Graded writing sample, preferably creative writing

"On the radio, it feels like someone's talking directly to you," says Ari Shapiro, co-anchor of NPR's *All Things Considered*. Whether it's radio shows like *This American Life* or podcasts like *538* or *Serial*, this is the Golden Age of Audio. Emulating the phenoms of the form, research, interview, story-board, and write script for recording and broadcast. Record, layer, and mix sound with innovative tools. Create your own mobile story that offers a new world, an industry insight, comedic relief, or a new friend to headphones everywhere.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019

Screenwriting Seminar

PREREQUISITE: Graded writing sample, preferably creative writing

Calling gamers, thespians, UX designers, and directors: refine your scene craft in this writers' room-inspired workshop. Analyze seminal films and binge-worthy episodes to identify and practice narrative structure, character, dialogue, format, voice, scope, pace, and setting. Critique and practice screenplay adaptation. Workshop original scenes and write a short screenplay.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: July 21 - August 9, 2019

Composition & Rhetoric

PREREQUISITES: Graded writing assignment AND one year of high school English

Using a popular culture and critical theory lens, students will read and write vigorously, synthesizing sourced ideas to support original claims. Develop persuasive presentations and write for impact across audiences. Workshop original pieces and submit a competitive digital portfolio worthy of undergraduate admissions.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019

ARTS, SOCIAL SCIENCES & HUMANITIES

ADMISSION CRITERIA:

- *Above-grade-level Tests: (taken in or before the 9th grade year): SAT R ≥ 28 OR SAT EBRW ≥ 550 OR ACT R ≥ 22*
- *On-level Tests: (taken in the 10th or 11th grade year): SAT EBRW ≥ 700 OR ACT R ≥ 32*
- *If test scores are not available, or do not meet the criteria, students are welcome to apply via Admission Portfolio.*

Critical Discourse: Introduction to Ethics

PREREQUISITE: Graded writing assignment

In a time when many claims are proved by *vigorous assertion*, evidence-based reasoning is scarce. This college-level survey of the most prominent ethical theories (e.g. consequentialism, Kantianism, moral relativism) lends depth and scope to contemporary issues such as right to privacy, artificial intelligence, and the use of biological materials. Argue issues from multiple sides, and practice various modes of appeal in a debate-centric and discussion-rich environment.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: July 21 - August 9, 2019

NEW! Science of Right & Wrong

PREREQUISITE: Graded writing assignment

Are our values shaped by our experiences or are our beliefs genetically coded? With the guidance of Jonathan Haidt's *The Righteous Mind* and Stephen Pinker's *The Better Angels of Our Nature*, students dig deep into Moral Foundations Theory and cognitive neuroscience to find the roots of human conviction and whether it's possible to change them. Leveraging insights from moral psychology, students design and consult on speech writing and other elements of political messaging to maximize the engagement potential of social rhetoric and political campaigns. HIGH SCHOOL CREDIT OFFERED: 1 semester OFFERED: June 30 - July 19, 2019

AP® Psychology

PREREQUISITE: Graded writing assignment

Understanding the relationship between the brain and behavior is crucial to medicine, marketing, learning science, economics, entertainment, and citizenship. AP® Psychology surveys the biological basis of behavior, sensation and perception, cognition, personality, social psychology, and abnormal psychology. Students review case studies, analyze experiment design, and prepare for the AP® Psychology exam. HIGH SCHOOL CREDIT OFFERED: 2 semesters OFFERED: July 21 - August 9, 2019

Economics of Everything

PREREQUISITE: Graded writing assignment

Microeconomics explores the impact of individual and organizational decisions on markets. Use decision theory, game theory, and market theory to interpret topics such as incentives, supply and demand, and competition. Design economic solutions to complex problems such as crime, educational achievement, safety regulations, environmental degradation, gender discrimination, health care, taxation, philanthropy, and political participation. Improve these solutions with an understanding of behavioral economics. HIGH SCHOOL CREDIT OFFERED: 1 semester OFFERED: June 30 - July 19, 2019

International Relations Seminar

PREREQUISITE: Graded writing assignment

As the western foreign policy pendulum swings toward populism, the ideal of global citizenship is complicated. This college-level seminar examines China's economic influence, current wars and armed conflicts, global migration, shifting tech and energy markets, Russia's position in the Ukraine and Middle East, free trade agreements, and the role of the United Nations. Students assess individual, national, and international responses to global events. HIGH SCHOOL CREDIT OFFERED: 1 semester OFFERED: July 21 - August 9, 2019

Leadership & Service

Service, Leadership & Community Transformation

Students interested in developing leadership skills through community service and hands-on study of social issues should consider the Civic Leadership Institute. For admission criteria and details, see our online course tool, or go to the Civic Leadership section of our website.

ENTREPRENEURSHIP

Venture Innovation Lab with LaunchX®

Join teen entrepreneurs from around the world to launch your own company in four weeks. Cultivate the business, technical, self-awareness, and interpersonal skills needed to design and test an original product with the goal of taking it to market. Build confidence and resilience as you engage with proven entrepreneurial frameworks such as Disciplined Entrepreneurship, Lean Startup methodology, and Design Thinking. Work collaboratively with a team of co-founders to overcome the challenges of starting a company. Benefit from Launch X's tested curriculum, experienced instructors, and state-of-the-art spaces on the Evanston campus of Northwestern University.

NOTES:

- For more information about this course, and the application process, please visit: <https://launchx.com/summer-program/northwestern.php>
- This course has an early application deadline of February 25, 2019.
- This course is residential only.
- This course runs from June 30 through July 26, 2019. Attendance for all four weeks is required.
- This course is for enrichment, and will not confer credit.

ABOUT THIS PARTNERSHIP:

The mission of LaunchX is to empower young people to build the future. Founded in 2012 by Laurie Stach and originally hosted exclusively at MIT, LaunchX gives high school students the skills and mindset to start real companies, putting tools, resources, and confidence in the hands of students with a passion for entrepreneurship.

SCIENCE

ADMISSION CRITERIA: Vary by course; please note the requirements for each course below.

Physics Honors; Quantum Mechanics & Relativity; Chemistry Honors; & AP® Chemistry:

- *Above-grade-level Test (taken in or before the 9th grade year): SAT R ≥ 28 + SAT M ≥ 550 OR ACT R ≥ 22 + ACT M ≥ 22 OR ACT S ≥ 23*
- *On-level Test (taken in the 10th or 11th grade year): SAT EBRW ≥ 700 + SAT M ≥ 740 OR ACT R ≥ 32 + ACT M ≥ 30 OR ACT S ≥ 30*
- *If test scores are not available, or do not meet the criteria, students are welcome to apply via Admission Portfolio.*

Cancer Biology; Human Anatomy & Physiology; Biotech Lab & Neuroscience

- *Above-grade-level Test (taken in or before the 9th grade year): SAT R ≥ 28 OR ACT R ≥ 22 OR ACT S ≥ 23*
- *On-level Test (taken in the 10th or 11th grade year): SAT EBRW ≥ 700 OR ACT R ≥ 32 OR ACT S ≥ 30*
- *If test scores are not available, or do not meet the criteria, students are welcome to apply via Admission Portfolio.*

Physics Honors

PREREQUISITES: Algebra I & II with Trigonometry AND one year of lab science

Physics helps explain, predict, and control physical phenomena. This full-year, accelerated course emphasizes fundamental principles of nature through the study of classical physics. Via lecture, discussion, demonstration, video, laboratory work, and collaborative problem solving, explore topics including linear, rotational, and wave motion; force; momentum; energy; and electrostatics and circuits. This course prepares students for AP® Physics and advanced topical studies in physics such as astrophysics and particle physics.

NOTES:

- *A graphing calculator is required.*
- *Additional \$175 lab fee required.*

HIGH SCHOOL CREDIT OFFERED: 2 semesters
 OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

Quantum Mechanics & Relativity

PREREQUISITES: Algebra I & II with Trigonometry AND one year of High School Physics

Relativity and Quantum Mechanics challenge our intuitions and experience in stunning ways. What are waves and particles like? How can space and time be woven together into spacetime? This course offers a

mix of readings, experiments, simulations, problems and discussion. Students investigate evidence that challenges their understanding of Newtonian physics. A glimpse of Quantum Field Theory, the Standard Model, Quantum Gravity and String Theory rounds out this course.

NOTES:

- *A graphing calculator is required.*
- *Additional \$175 lab fee required.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: June 30 - July 19, 2019

Chemistry Honors

PREREQUISITES: Algebra I AND High School Biology OR Physics

How does an atom account for the nature of matter? Prepare for AP® Chemistry by mastering the core concepts of chemistry, including atomic models, valence and ionization, bonding, nomenclature of formulas, moles, stoichiometry, gas laws, molecular forces, polarity, solutions, equilibrium, acids and bases, thermochemistry, and oxidation-reduction. Through experiments, learn to use proper lab technique, record and analyze data to produce scientific lab reports. Chemistry Honors is a full-year course in an accelerated format.

NOTES:

- *A graphing calculator is required.*
- *Additional \$175 lab fee required.*

HIGH SCHOOL CREDIT OFFERED: 2 semesters
 OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

AP® Chemistry

PREREQUISITES: High School Chemistry AND Algebra I & II

This course focuses on thermodynamics, thermochemistry, the physical behavior of gases, states and structure of matter, chemical equilibrium and kinetics, and various types of chemical reactions. Daily laboratory work emphasizes competency in solving chemical calculations and problems. In the accelerated format, this rigorous and lab-heavy course requires significant study and dedication. Upon successful completion, students are prepared to take the AP® Chemistry exam.

NOTES:

- *A graphing calculator is required.*
- *Additional \$250 lab fee required.*
- *This course runs for five weeks. Attendance for all five weeks is required.*

HIGH SCHOOL CREDIT OFFERED: 2 semesters
 OFFERED: This course runs for five weeks, June 30 - August 2, 2019

UPDATED FAVORITE: Cancer Biology & the Promise of Immunotherapy

PREREQUISITE: High School Biology

The research of James P. Allison and Tasuku Honjo, recipients of the 2018 Nobel Prize in Medicine, demonstrates the potential of the immune system to fight cancer. This course will explore treatments that target the immune system and use Hanahan and Weinberg's "Hallmarks of Cancer" framework to recognize how cancer cell behavior differs from normal cells. Survey the literature on current clinical therapies and conduct wet lab experiments to better understand cancer biology and treatment.

NOTES:

- *Additional \$175 lab fee required.*
- *This course uses classroom and laboratory space at Roycemore School.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: June 30 - July 19, 2019

RETURNING FAVORITE! Neuroscience Seminar

PREREQUISITE: High School Biology

Explore the complex systems of the human brain, drawing on the interdisciplinary principles of biology, chemistry, anatomy, physiology, and psychology. Topics include neural systems and behavior; the embryonic developments of the central and peripheral nervous systems; study of sensory and motor systems; changes in brain chemistry; aspects of learning and memory; and disorders of the nervous system. Labs support lecture and discussion.

NOTES:

- *Additional \$175 lab fee required.*
- *This course uses classroom and laboratory space at Roycemore School.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: June 30 - July 19, 2019

Human Anatomy & Physiology

PREREQUISITE: High School Biology

Examine the chemistry of cellular life, cell structure and function, human organization, major systems of the human body, human and medical genetics, DNA and biotechnology, human evolution, ecology, and population concerns. To develop lab skills required for advanced study in biology, perform dissections, as well as experiments in molecular genetics, histology, and the chemical composition of cells. This course helps prepare students for AP® Biology.

NOTES:

- *Additional \$175 lab fee required.*
- *This course uses classroom and laboratory space at Roycemore School.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: July 21 - August 9, 2019

Biotech Lab

PREREQUISITES: High School Biology AND additional full year of lab science (Chemistry preferred)

Using current techniques in biotechnology, scientists can identify and potentially eliminate genetic diseases and engineer microorganisms to do their bidding. Practice laboratory techniques used in research and commercial settings, including gene cloning, electrophoresis, chromatography, protein purification, enzyme and immunology assays, and bacterial cell incubation. Through case studies and individual research, discuss the complex ethical and social implications of biotechnology.

NOTES:

- *Additional \$175 lab fee required.*
- *This course uses classroom and laboratory space at Roycemore School.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: July 21 - August 9, 2019

TECHNOLOGY, COMPUTER SCIENCE & ENGINEERING

ADMISSION CRITERIA: *Vary by course; please note the requirements for each course below.*

IoT Engineering, iOS Bootcamp, Kotlin Bootcamp, Mechatronics, & AP® Computer Science A

- *Above-grade-level Test (taken in or before the 9th grade year): SAT M ≥550 OR SAT R ≥28 OR ACT M ≥22 OR ACT R ≥22*
- *On-level Test (taken in the 10th or 11th grade year): SAT EBRW ≥700 OR SAT M ≥740 OR ACT M ≥30 OR ACT R ≥32*
- *If test scores are not available, or do not meet the criteria, students are welcome to apply via Admission Portfolio.*

SustainableXDesign: Design Challenge 2019 with the Chicago Architecture Center

- *Above-grade-level Test (taken in or before the 9th grade year): SAT R ≥28 + SAT M ≥550 OR ACT R ≥22 + ACT M ≥22 OR ACT S ≥23*
- *On-level Test (taken in the 10th or 11th grade year): SAT EBRW ≥700 + SAT M ≥740 OR ACT R ≥32 + ACT M ≥30 OR ACT S ≥30*
- *If test scores are not available, or do not meet the criteria, students are welcome to apply via Admission Portfolio.*

NEW! IoT Engineering with Windy City Lab

PREREQUISITES: Algebra I AND previous programming experience

"Alexa, lock the front door and set a timer for ten minutes." Internet of Things devices are transforming

our expectations for domestic convenience and manufacturing alike. At the Bosch 1871 Connectory® in downtown Chicago, design and build an Internet of Things device with the goal of taking it to market. This fab-lab intensive builds on basic skills in software and hardware engineering, using professional tools for creating schematics and printed circuit boards. Write firmware in C/C++ inside the ARM Cortex M Microcontroller development environment. Use OnShape and current 3D printing and laser cutting tools to create a bench top prototype. Explore communication tools such as Low Energy Bluetooth, LTE, WiFi, and MQTT, that integrate IoT ecosystems, connecting IoT devices to smartphones, and to the cloud.

NOTES:

- A laptop computer (not a tablet) is required for this course.
- Residential students will live on campus and travel via public transit to class downtown daily.
- This course is offered at the Partnership tuition rate.
- This course is eligible for the Sandra Dennhardt Technology Scholarship.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019

ABOUT THIS PARTNERSHIP

Windy City Lab is the brainchild of former IBM Deck5 Software developer Kevin McQuown, whose passion for digital electronics inspired his maker space in the 1871 Bosch Connectory® at Merchandise Mart in Downtown Chicago. Windy City Lab believes there is no substitute for learning-by-doing, asking questions, and getting your hands on a soldering iron.

iOS Bootcamp & Swift Development with MobileMakersEDU

PREREQUISITES: Algebra I AND previous programming experience

Do you have a killer idea for an iOS mobile app? Master Swift programming to create an original app in Xcode, Apple's official development environment. Learn and apply skills essential to app development productivity, such as human-centered design, Agile Project Management, and pair programming. Workshop your code, learn to justify your syntax, and problem-solve in a collaborative environment that celebrates creativity and innovation.

NOTES:

- Additional \$250 technology fee required.
- All students are required to bring their own Mac laptop computer (two years old or newer) for this course. An iOS mobile device is also recommended (such as iPhone or iPad).
- This course is eligible for the Sandra Dennhardt Technology Scholarship.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: June 30 - July 19, 2019

ABOUT THIS PARTNERSHIP

MobileMakersEdu offers iOS app development coursework, training, and support to schools across the nation. Equinox students become app developers with the support of Mobile Makers' expert instructors and an accelerated version of their bootcamp curriculum.

NEW! Hello Kotlin: Android Bootcamp

PREREQUISITES: Algebra I AND previous programming experience

You don't need Java to build Android apps anymore. Do more with less using Kotlin, the future language for building Android apps. Design and build a mobile app for Android devices with the goal of publishing it to Google Play. Learn the protocols in machine-to-machine conversations when devices communicate over the network. Leverage individual and team capabilities to deliver creative mobile app solutions. Apply the Agile Scrum process for managing the Software Development Life Cycle. Compare Kotlin to other programming languages such as Java, Swift, & JavaScript to prepare for advanced computer science studies.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: July 21 - August 9, 2019

NOTES:

- Additional \$250 technology fee required.
- All students are required to bring their own laptop computer (not a tablet), running the most current version of Windows.
- This course is eligible for the Sandra Dennhardt Technology Scholarship.

Mechatronics: Electro-Mechanical Design with McCormick School of Engineering

PREREQUISITES: Algebra I AND previous programming experience

All engineers need a working knowledge of electronics, and Mechatronics is the study of electro-mechanical design. In partnership with Northwestern's McCormick School of Engineering, this course will explore the intersection of mechanical rapid prototyping, circuit design, and programming. Students will learn how to design, solder and debug a printed circuit board (PCB), learn advanced digital communication protocols like SPI, I2C and USB, create physical prototypes with a laser cutter and 3D printer, and interface with an Android device. As a capstone project, students will build an autonomous robot and compete in a design competition.

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: July 21 - August 9, 2019

NOTES:

- Additional \$175 materials fee required.
- A laptop computer (not a tablet) is required for this course.

AP® Computer Science A

PREREQUISITES: Algebra I & II AND demonstrated experience in one programming language
 Java is used in industries ranging from retail to finance and medicine. Learn to program in Java using keywords, operators and data types to develop solutions to problems, and subsequently to code and compile programs, as well as to compose command line programs, basic graphics and simple games. This course prepares students for the AP® Computer Science A exam. This is a full year course compressed into a three-week accelerated format.

NOTES:

- A laptop computer (not a tablet) is required for this course.
- This course is eligible for the Sandra Dennhardt Technology Scholarship.

HIGH SCHOOL CREDIT OFFERED: 2 semesters
 OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

SustainableXDesign: Design Challenge 2019 with Chicago Architecture Center

PREREQUISITES: Algebra I, Geometry AND one year of high school English
"Sustainability can't be like some sort of a moral sacrifice or political dilemma or a philanthropical cause. It has to be a design challenge." —Bjarke Ingles

In this thrilling partnership with the Chicago Architecture Center, tour iconic skyscrapers, residences, and design firms, and investigate national and international case studies in search of solutions to the challenge of sustainable design. Under the guidance of local architects and designers, learn the fundamentals of architecture and the design process including sketching, model-making, mapping, and research. Use SketchUp, CAD, and Autodesk Revit BIM to develop fluency with software for building, structural design, MEP engineering, and construction. Create an original design and prototype, and receive critique in the final showcase from renowned architects and designers.

NOTES:

- A laptop computer (not a tablet) is required for this course.
- Residential students will live on campus and will travel via public transit to class downtown.
- This course is offered at the Partnership tuition rate.

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: July 21 - August 9, 2019

ABOUT THIS PARTNERSHIP

Chicago Architecture Center is a leading organization devoted to celebrating and promoting Chicago as a center of architecture innovation. As Chicago's forum for the exchange of ideas on urban design, CAC inspires people to participate in the building of vibrant, sustainable communities and to demand the highest standard in urban design. CAC awakens young people to achieve their potential through the discovery of architecture, engineering and design.

MATHEMATICS

ADMISSION CRITERIA:

- Above-grade-level Test (taken in or before the 9th grade year): SAT M ≥ 550 OR ACT M ≥ 22
- On-level Test (taken in the 10th or 11th grade year): SAT M ≥ 740 OR ACT M ≥ 30
- If test scores are not available, or do not meet the criteria, students are welcome to apply via Admission Portfolio.

NOTE: For all math courses, a graphing calculator is required in addition to a laptop computer or tablet.

NEW! Foundations & Frontiers in Mathematics

PREREQUISITE: Algebra I, Geometry, & Algebra II & Trigonometry

Can a theorem model the existence of sentient droids? Find out what happens when axiomatic systems like Euclidean Geometry are challenged, revealing systems like hyperbolic geometry and special relativity. Witness how physicists use these systems to understand nature, space, and time. Discover how Gödel's incompleteness theorem raises questions about artificial intelligence. Follow the footsteps of Lobachevsky, Einstein, and Euclid to design and test an axiomatic system.

HIGH SCHOOL CREDIT OFFERED: 1 semester
 OFFERED: June 30 - July 19, 2019

AP® Statistics

PREREQUISITES: Algebra I & II

Collecting, analyzing, and drawing conclusions from data are skills required in virtually every discipline. Explore theories of probability, descriptions of statistical measurements, probability distributions, and experimental and statistical inference. Develop research proposals, collect and analyze data, and complete a comprehensive statistical project. AP® Statistics is a full-year course taught in an accelerated format designed to prepare students for the AP® Statistics exam. It lays the foundation for advanced studies in data analytics, engineering, and the actuarial sciences.

HIGH SCHOOL CREDIT OFFERED: 2 semesters
 OFFERED: June 30 - July 19, 2019

NEW! Creating Knowledge: Data by Design

PREREQUISITE: *Algebra I AND one year of lab science*

Undergraduate research programs at universities like Northwestern are growing, giving students the chance to create knowledge. Building on the foundation of the scientific method, ask *Where does knowledge come from?* Explore concepts such as statistical bias, distribution, margin of error, population, and validity. Assess the hazards and potential of key research methodologies, protocols, and study designs. Interpret and analyze data on a topic of interest and design a study to produce statistically significant results.

NOTE: *A laptop computer (not a tablet) is required for this course.*

HIGH SCHOOL CREDIT OFFERED: 1 semester
OFFERED: July 21 - August 9, 2019

Algebra II & Trigonometry Honors

PREREQUISITE: *Algebra I*

Algebra II & Trigonometry Honors covers systems, equations, polynomial arithmetic, complex numbers, solutions of quadratic equations, exponential and logarithmic functions, sequences, series, graphs of polynomial functions, conic sections, and concepts in trigonometry, including trigonometric identities.

Algebra II & Trigonometry Honors is a full-year course in an accelerated format.

HIGH SCHOOL CREDIT OFFERED: 2 semesters
OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

Pre-Calculus Honors

PREREQUISITES: *Geometry AND Algebra I & II with Trigonometry*

Pre-Calculus Honors builds upon advanced algebra. Topics include linear, quadratic, polynomial, exponential, logarithmic, and trigonometric functions. Students apply vectors, sequences, series, and matrices to solve problems. Advanced topics include functions and graphs, trigonometry, and discrete mathematics. Pre-Calculus Honors is a full-year high school course in an accelerated format and prepares students for taking AP® Calculus AB or BC.

HIGH SCHOOL CREDIT OFFERED: 2 semesters
OFFERED: June 30 - July 19, 2019 & July 21 - August 9, 2019

AP® Calculus AB

PREREQUISITES: Geometry AND Algebra I & II with Trigonometry AND Pre-Calculus

Rocket scientist or brain surgeon, architect or engineer, the study of calculus is foundational. This college-level course covers analytic geometry, functions, limits, continuity, derivatives, integrals, and their applications. It explores symbolic differentiation and integration utilities as students apply these skills to solve problems. AP® Calculus AB is a full-year high school course in an accelerated format and prepares students to take the AP® Calculus AB exam.

HIGH SCHOOL CREDIT OFFERED: 2 semesters
OFFERED: July 21 - August 9, 2019