Center for Talent Development

Summer Program

2016 Program Catalog
Students Age 4 through Grade 12

www.ctd.northwestern.edu
847/491-3782, ext. 2
summer@ctd.northwestern.edu

An experience you’ll share for a lifetime

Northwestern | CTD
Welcome to the 2016 Summer Program

The Center for Talent Development (CTD) Summer Program allows gifted students to delve deep into a subject of intrigue, build upon their strengths and connect with a community of peers. From fast-paced enrichment options to accelerated, credit-bearing offerings, there is something for everyone from age four through grade twelve!

What sets the CTD Summer Program apart from other summer programs?

• A unique blend of enrichment and credit-bearing course offerings that exemplify CTD’s talent development philosophy. CTD’s multiple program pathways meet students’ needs from age four through high school and guide families through the journey of intellectual, emotional, and social growth.

• Rigorous courses backed by one of the world’s most respected universities. CTD is part of Northwestern University’s School of Education and Social Policy and is accredited by the North Central Association Commission on Accreditation and School Improvement. Additionally, all Advanced Placement (AP®) courses are approved by the College Board.

• Sustained engagement with the CTD community and access to valuable resources. Enrolled students and their parents receive a one-year subscription to CTD Backpack, an online learning community and resource library curated by CTD staff.

• Deep expertise in gifted education. CTD is a leading gifted education research center. Read more about our research at ctd.northwestern.edu/research.

This catalog introduces our many program options and courses for summer 2016. We invite you to visit our website at ctd.northwestern.edu/summer to learn more about our programs, explore our menu of course offerings, and find application procedures.

Center for Talent Development has been accredited as a nonpublic supplementary school by the North Central Association Commission on Accreditation and School Improvement (NCA CASI) since April 1, 1994. NCA CASI is recognized by the U.S. Department of Education and has more than 100 years of experience in improving educational quality.
In this catalog you will find brief descriptions of each CTD Summer Program, 2016 program dates, and course descriptions.

The catalog is a companion piece to our website. All program details — including eligibility criteria, tuition and fees, admission requirements, financial aid process, and the online application — are located on the Center for Talent Development website at www.ctd.northwestern.edu. Click on “Programs” in the navigation bar or scroll down the home page to find the Summer Program icon. Once on the Summer Program landing page, select the appropriate program for your child.

• **Leapfrog:** Half-day and all-day, weeklong courses for students age 4 through grade 3

• **Spark:** All-day, weeklong courses for students in grade 3 or 4

• **Solstice:** 2-week program (residential or commuter) for students in grades 4-6

• **Apogee:** 3-week program (residential or commuter) for students in grades 4-6

• **Spectrum:** 3-week or 5-week program (residential or commuter) for students in grades 7 or 8

• **Equinox:** 3-week or 5-week program (residential or commuter) for students in grades 9-12

• **Civic Leadership Institute:** 3-week service-learning program (residential only) for students in grades 9-12

All students applying to the CTD Summer Program should select courses in a subject area of greatest interest and strength. Course content is advanced, typically one to two years above grade level. Our goal is to challenge and support students in a way that develops their talents to the fullest.

Enjoy reading this year’s course catalog. We look forward to receiving your application!
2016 Summer Program at a Glance

Application period opens January 4, 2016. Apply early!

Courses are filled on a first-come, first-served basis and many courses fill well before the application deadline.

STUDENTS AGE 4 (PreK) – GRADE 3 (grade level on January 1, 2016)

Leapfrog Program
Leapfrog provides enrichment courses for students who have demonstrated a keen, early interest in learning. Half-day or all-day, one-week courses are offered mornings and afternoons. The Leapfrog program site locations are listed on the Summer Program website.

New in 2016:
• Challenge Lab at the Evanston and Palatine program sites. See page 11 for details.

Program Dates & Locations
June 27-July 1
Week 1, Leapfrog Favorites in Evanston and Lake Forest, morning only

July 5-8 (4-day week)
Week 2, Leapfrog Favorites in Chicago and Naperville, morning only

July 11-15
Week 3, all sites; morning, afternoon, and all-day courses*

July 18-22
Week 4, all sites; morning, afternoon, and all-day courses*

July 25-29
Week 5, all sites; morning, afternoon, and all-day courses*

Sites
Chicago, Evanston, Lake Forest, Naperville, and Palatine

*Availability of afternoon and all-day courses varies by site.
**STUDENTS GRADES 4-6*** (grade level on January 1, 2016)

Three program options: Spark* (1 week), Solstice (2 weeks), or Apogee (3 weeks)

There are multiple program offerings for students in grades 4 through 6 because of the varied academic, social, and developmental needs of students in this broad age group. Select the appropriate program based on your child’s academic needs and social-emotional readiness, particularly when considering the Solstice or Apogee residential program option.

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**Spark Program**

Spark is a week of fun, mind-stretching learning experiences for students in grade 3 or 4. Program and course information begins on page 18.

**Program Dates & Locations:**

- **Elmhurst College, Elmhurst, IL**
  - Monday, June 13-Friday, June 17
  - Monday, June 20-Friday, June 24
  - Monday, June 27-Friday, July 1

- **Chicago**
  - Monday, July 11-Friday, July 15
  - Monday, July 18-Friday, July 22
  - Monday, July 25-Friday, July 29

- **Evanston**
  - Monday, July 11-Friday, July 15
  - Monday, July 18-Friday, July 22
  - Monday, July 25-Friday, July 29

**New in 2016**

- Residential Option at Elmhurst College

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**Solstice Program**

The Solstice program offers enrichment courses in a two-week timeframe perfect for extended study of a subject. Students may reside on campus or commute from home. Program and course information begins on page 20.

**Program Dates & Locations**

- **Elmhurst College, Elmhurst IL**
  - Sunday, June 12-Friday, June 24
    (residential or commuter)
  - Monday, June 27-Friday, July 8
    (commuter only; no class on Monday, July 4)

- **Northwestern University, Evanston, IL**
  - Sunday, June 26-Friday, July 8
  - Sunday, July 10-Friday, July 22
  - Sunday, July 24-Friday, August 5

**New in 2016**

- Residential Option at Elmhurst College

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**Apogee Program**

The three-week Apogee program gives students the opportunity to take a fast-paced course that hones critical academic skills and deepens knowledge and understanding of a particular subject. In 2016, Apogee also includes two graded, high-school-level math and computer science courses (Algebra I & Java). Students may choose to reside on the Northwestern University Evanston, Illinois campus. Program and course information begins on page 23.

**Program Dates**

- **Northwestern University, Evanston, IL**
  - (residential or commuter)
  - Sunday, June 26-Friday, July 15
  - Sunday, July 17-Friday, August 5

* Students in grade 3 may apply for Spark courses. See Spark course information on page 18.
2016 Summer Program at a Glance

STUDENTS GRADES 7 & 8* (grade level on January 1, 2016)

**Spectrum Program**
Spectrum offers three-week, in-depth enrichment and accelerated honors courses that stretch young minds and provide challenge beyond grade level. Honors courses bear high school credit through Center for Talent Development. Program and course information begins on page 28.

*Students in grade 9 may apply; applications will be considered on a case-by-case basis.

**Equinox Program**
Equinox combines fast-paced, advanced coursework with the chance to explore college and careers in a hands-on way within a community of learners. Equinox's high school and college-level course offerings provide academic rigor and the opportunity to earn high school credit at the honors and Advanced Placement® (AP) levels through Center for Talent Development. Students can experience life on the Northwestern University, Evanston Illinois campus as a residential participant or commute from home. Program and course information begins on page 36.

Northwestern University, Evanston, IL (residential or commuter)

**Program Dates**
- Sunday, June 26-Friday, July 15
- Sunday, July 17-Friday, August 5
- Sunday, June 26-Friday, July 29 (5-week course)

STUDENTS GRADES 9-12 (grade level on January 1, 2016)

Northwestern University, Evanston, IL (residential or commuter)

**Program Dates**
- Sunday, June 26-Friday, July 15
- Sunday, July 17-Friday, August 5
- Sunday, June 26-Friday, July 29 (5-week courses)

Civic Leadership Institute
Held in the heart of downtown Chicago, the Civic Leadership Institute (CLI) brings outstanding young leaders together to develop the knowledge, experience and skills they need to make a positive impact on the world. CLI combines an innovative service-learning curriculum with an unforgettable residential experience. Program information begins on page 43.

Chicago, IL (residential only)

**Program Dates**
- Sunday, July 10-Friday, July 29
Since 2011, Center for Talent Development has offered Summer Program courses at Elmhurst College in Elmhurst, Illinois. This summer, a selection of Spark and Solstice program courses will be held at Elmhurst College. And, for the first time, we are offering a residential option at Elmhurst College for students in the Solstice program.

Students who apply for Session 1 at Elmhurst, June 12-24, may choose to reside in the residence hall or commute from home. Taking courses while living on a college campus affords students ready for a residential program the opportunity to experience college in a safe and structured way. Expertly trained residential staff will engage students in activities, field trips, and camp experiences to create memories that will last a lifetime.

Elmhurst College is a warm and welcoming environment for young residents. Elmhurst is a private, four-year, liberal arts college located 16 miles west of the Chicago Loop. The 48-acre grounds are an arboretum, with more than 700 varieties of trees, shrubs, and other woody plants. Its classic red-brick buildings are equipped with all the technology required of today’s modern classrooms, making it an ideal site for CTD courses.

### Elmhurst College Dates

**Spark**  
(weeklong courses, Monday through Friday)  
Monday, June 13-Friday, June 17  
Monday, June 20-Friday, June 24  
Monday, June 27-Friday, July 1

**Solstice**  
(2-week courses)  
Session 1: Sunday, June 12-Friday, June 24 (residential or commuter)  
Session 2: Monday, June 27-Friday, July 8 (commuter only; no class on Monday, July 4)

For the course offerings and descriptions, see the Spark program section starting on page 18 or the Solstice program section starting on page 20.
Courses are offered in Chicago, Lake Forest, Naperville, Palatine, and Evanston, Illinois. For specific locations, please see the Summer Program website.

There are three different types of course offerings:

- **Half-day A.M.** Leapfrog morning courses meet from 9 a.m. to 12 noon daily for five consecutive days (Monday through Friday), except for the 4-day week of July 5-8 (Tuesday through Friday).
- **Half-day P.M.** Leapfrog afternoon courses meet from 1 p.m. to 4 p.m. daily for five consecutive days (Monday through Friday).
- **All-day** All-day Leapfrog courses are available for students in grades 1, 2 or 3. All-day courses meet from 9:15 a.m. to 3:45 p.m. with a break for lunch.

**Note:**

You may enroll your child in an A.M. course, a P.M. course, or both. All students enrolled in both an A.M. course and a P.M. course are automatically enrolled in the 12 noon to 1 p.m. lunch/recess at no extra cost.

“My son’s Leapfrog course intertwined multiple disciplines within one topic — story writing, drawing, math, science, technology — they all came together in one class.”

—2015 Leapfrog parent
Leapfrog Half-day Course Reference Chart

Select a course matching your child's grade level as of January 1, 2016. Select course topics that best fit your child's academic strengths as determined through test scores and other academic measures.

Leapfrog Favorites Courses
W1 = Week 1: June 27-July 1
W2 = Week 2: July 5-8

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<th>COURSE TITLE</th>
<th>SUBJECT AREA</th>
<th>LF AM</th>
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KEY
CH Chicago A.M. 9 a.m.–12 noon
EV Evanston P.M. 1 p.m.–4 p.m.
LF Lake Forest
NP Naperville
PA Palatine

Week 3: Half-day Courses
July 11-15

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(Week 3: Half-day Courses continued on next page)
### Week 3: Half-day Courses (Continued)
#### July 11-15

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### Week 4: Half-day Courses
#### July 18-22

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### Week 5: Half-day Courses
July 25-29

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Leapfrog Half-day Course Descriptions

Week 1: June 27-July 1
Leapfrog Favorites (Evanston & Lake Forest)
A select group of our most popular Leapfrog courses will be offered at our Evanston, Lake Forest, Chicago, and Naperville locations. All courses meet from 9 a.m. to 12 noon daily. See course charts on pages 7-9 for course availability per site and week.

Week 2: July 5-8
(four-day week)
Leapfrog Favorites (Chicago & Naperville)

English & Language Arts Favorites
Students with strong verbal or reading ability may enroll in an English & Language Arts course. Courses correspond with a child’s grade level as of January 1, 2016.

(PreK/K) Puppet Productions
Young storytellers learn about character, sequence, and the structure of puppet plays. Through storytelling, role-playing, and vocabulary activities, students extend their literacy skills.

(K/1) Click! Telling Stories with Photos
Photographs are both inspiration and illustration as students combine words and images in the creation of original stories and poems. Students take their own photos as well as collect photos from families, magazines, and other sources.

(1/2) Comic Book Characters
What do Babymouse, Spiderman, and Charlie Brown have in common? They are all characters in stories found in comic books, comic strips, and graphic novels. Students create original works on paper using a combination of creative writing and drawing.

(2/3) Scene Workshop
From dialogue to stage direction, students explore writing techniques for effective scene and playwriting. Students study inspiring scenes from movies or plays and then write and revise their own pieces for film or stage.

Science Favorites
Students with strong verbal/reading or math ability may enroll in a Science course. Courses correspond with a child’s grade level as of January 1, 2016.

(PreK/K) Big Cats: Lions, Tigers & More
As novice zoologists, students explore the captivating world of big cats from lions to jaguars to unique cat hybrids. Students “travel” across the globe to observe and discuss how these astounding animals interact with their habitat and each other. Through research and hands-on activities, students are introduced to the world of these marvelous mammals and gain an appreciation of wildlife conservation.

(K/1) Blocks & Blueprints
A blueprint is a drawing that shows the design of a building or an outdoor area. Using blocks and other construction materials, students create models of buildings and spaces. Then they apply geometry concepts and skills such as measuring perimeter, area, and angles to draft blueprints and scaled diagrams of their creations.

(K/1) Blocks & Blueprints
(PreK/K) Math for Breakfast
Math is on the menu as students apply mathematical skills and concepts to the work of cooks, bakers, and nutritionists. This course nourishes young minds with a well-balanced mathematical meal of measuring, timing, comparing, and computing.

(2/3) Rocket Science: Blast Off with Newton
How do rockets blast off? Why do balloons fly in circles if you let the air out? Junior rocket scientists investigate Newton’s laws of motion through demonstrations, online simulations, and conducting experiments. In small, collaborative groups, students apply what they learn by building and launching their own simple rockets.
Computer Science & Technology Favorites

Students with strong verbal/reading or math ability may enroll in a Computer Science & Technology course. Courses correspond with a child’s grade level as of January 1, 2016.

(PreK/K) Story Code Alpha
Stories can be shared in many ways: through a book, on stage, or even through computer animation. Students use touch screens and educational apps, such as Daisy the Dinosaur and Kodable, to learn introductory programming and coding concepts such as block, symbol, and sequence.

(K/1) Story Code Beta
Scratch Jr. is the newest version of the educational Scratch programming language developed by the MIT Media Lab. Young programmers use Scratch Jr. as well as traditional methods like drawing, writing, and dramatization to bring their stories to life.

For more Leapfrog technology courses, see page 15.

New! Introducing Challenge Lab, a CTD Maker Space for Grades 1-4

Enroll your child in a single three-hour session or choose multiple sessions. No test scores or portfolio required for Challenge Lab enrollment. Sessions are offered Tuesday, Wednesday, and Thursday mornings, 9 a.m. to 12 noon, from July 12-28, at the Evanston and Palatine sites only.

Description

A “maker space” is a learning workshop equipped with a variety of materials and tools for making things. Students explore and experiment as they acquire design engineering and problem-solving skills. Each unique project reflects the interests and ideas of each maker.

Challenge Lab demonstrates CTD’s commitment to challenge students to reach their greatest potential. In our Leapfrog maker space, instructors will offer questions, choices, and challenges that inspire student projects and encourage students to reflect on their process and extend their ideas.

The Challenge Lab space will be divided into work stations such as a digital work station, a woodworking station, a “loose parts” station with plastic and metal materials, and a research and inspiration station.

The Challenge Lab instructor will begin by welcoming students and inviting them to interact with open-ended materials that will spark ideas and creativity. Students will then be introduced to the theme-related challenge of the day and begin working on projects. The instructors will assist students with tools and materials, offer guidance as needed, and encourage collaboration between students. At the end of the session, students will gather and share their projects and talk about how they can continue to work on their ideas at home.

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<thead>
<tr>
<th>WEEKS OFFERED</th>
<th>GRADE LEVELS</th>
<th>DAILY CHALLENGES</th>
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| Week 3        | Grades 1 and 2 | July 12: Working with wood  
|               |               | July 13: Air-powered vehicles and machines  
|               |               | July 14: Design a product that helps pets |
| Week 4        | Grades 2 and 3 | July 19: Working with nuts, bolts, and other hardware  
|               |               | July 20: Spring-powered vehicles and machines  
|               |               | July 21: Design a helping robot |
| Week 5        | Grades 3 and 4 | July 26: Working with light and sound  
|               |               | July 27: Battery-powered vehicles and machines  
|               |               | July 28: Use adaptive design to make something that helps people |

Challenge Lab Themes

Tuesdays: Build
Focus on making things using materials and tools in new and innovative ways.

Wednesdays: Move
Focus on making things that move or have a power source.

Thursdays: Help
Focus on making things that help improve our lives or our world.

(1/2) Story Code Gamma
How is a story on paper different from a story on a computer screen? Students use creativity and critical thinking to develop and present stories using apps such as Scratch Jr. and Hopscotch.

(2/3) Story Code Delta
Students create detailed narratives with multiple characters and settings. They learn to animate their stories using Scratch Jr. and/or the original web-based Scratch programming language.

Design & Engineering Favorites

Students with strong verbal/reading or math ability may enroll in a Design & Engineering course. Courses correspond with a child’s grade level as of January 1, 2016.

(PreK/K) Bee-Bot® Town
Bee-Bots® are educational robots designed to introduce young children to computer programming. Students practice and demonstrate introductory coding concepts such as symbol, sequence, and loop as they create homes and roads for their Bee-Bot® friends.

(1/2) Hexbug® Habitats
Hexbug® toys are a fascinating example of bio-inspired robotics, the study of how to make robots that simulate living organisms. Students analyze the form and function of various Hexbug® creatures and build habitats that demonstrate each robot’s unique characteristics, such as sensors and tentacles.

(1/2) Story Code Gamma
How is a story on paper different from a story on a computer screen? Students use creativity and critical thinking to develop and present stories using apps such as Scratch Jr. and Hopscotch.

(2/3) Story Code Delta
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Leapfrog Weeks
3-5 Half-day
Course Descriptions

English & Language Arts Courses

Students with strong verbal or reading ability may enroll in an English & Language Arts course. Courses correspond to a child’s grade level as of January 1, 2016.

Week 3 (July 11-15)
You're in the Story

Stories are a powerful way to communicate ideas, emotions, and information. Settings from the bottom of the ocean to towering mountains provide the backdrop for students to create and act out their own stories. Students strengthen language and literacy skills through dramatic play, creative writing and storytelling, reading and research, and collaborative problem solving.

(PreK/K) Yellow Submarine
The words to the Beatles’ song, “Yellow Submarine,” inspire students to play, imagine, draw, and write about life under the waves in a sea of green. The class becomes a maritime crew as they learn the roles of pilots, navigators, explorers, and scientists. Students hone their language and early writing skills through creative storytelling and dramatization.

(K/1) South Pole: Journey to Antarctica
As explorers and scientists “traveling” to the coldest continent on the earth, students learn about the biodiversity of Antarctica and the animals living there, such as penguins and seals. Students imagine and create their own research station at the South Pole and produce guidebooks, articles, and stories about Antarctica.

(1/2) Survivor: Bermuda Triangle
A mysterious region in the Atlantic Ocean, the Bermuda Triangle is the source of many stories and legends involving disappearing ships and strange sea creatures. Students imagine themselves in the roles of explorers sailing through the Bermuda Triangle as they create stories, murals, and skits representing their ideas and theories about the curious happenings at sea.

(2/3) Climbing Mount Everest
As climbers seeking to reach the top of Everest, the Earth’s highest mountain, students role-play and imagine the challenges of this monumental feat. Students research weather, topography, geography, and climbing techniques, read the stories of previous climbers, and create, through writing and illustrations, their own imagined accounts of the grueling and heroic journey.

Week 4 (July 18-22)
Animal Friends & Foes
Mice, horses, sharks, and gorillas are all fascinating animals that have been featured in books, articles and stories. Students explore the connections between animals and humans, both real and imagined, as they develop and practice language, research, and writing skills.

(PreK/K) Mouse Adventures: Tiny Habitats in Stories & Nature
Storybook mice, such as Stuart Little, fascinate readers with their tiny furniture and cozy little living spaces. Students explore how the homes of storybook mice compare to the habitats of real mice. Read-alouds and storytelling combine with an introduction to research skills, critical thinking, and creative writing.

(K/1) Horses, Wild & Tame
Long ago, all horses were wild and free; but humans have found ways to train these beautiful, strong animals to carry riders and pull heavy loads. Students learn about the ways humans and horses work together by exploring both fiction and nonfiction stories and resources. Creative projects such as writing stories and skits allow students to study all types of horses, from ponies to stallions.

(1/2) Shark Attack! Underwater Mythbusting
Sharks are the most feared creatures in the ocean, but actual shark attacks on people are very rare. As aspiring mythbusters, students research how and why sharks inspire fascination and fear, use critical thinking to determine the real facts, and document their findings and ideas with both words and images.

(2/3) Sign of the Gorilla: Extraordinary Apes
Koko, a female gorilla born in the San Francisco Zoo, learned to use gestures from American Sign Language to communicate with her trainers. Students explore the story of Koko and other extraordinary apes and imagine the possibilities for future communication between animals and humans. Reading, writing, researching, illustrating, diagramming, demonstrating, and dramatizing are just some of the skills students incorporate into creative projects.

Week 5 (July 25-29)
Stories, Fact & Fiction
Since the beginning of time, humans have shaped and defined history using their imaginations. As they explore the roots, truths, and falsehoods around pirates and monsters, myths and dragons, students sharpen their writing, research, and critical thinking skills. Readings coupled with writing projects, visual displays, and drama activities provide students with opportunities to examine facts and fiction.

(PreK/K) Pirates & Treasures
Through fiction and non-fiction, students discover pirates and treasures, decipher codes and hunt for clues. Participants study the historical and cultural forces that surrounded pirating in different parts of the world at different time periods. To develop writing skills, students write, draw, and dictate journal entries and stories.

(K/1) Monsters & Mermaids
Students expand their reading, writing, and researching skills through the exploration of fantastic tales about mysterious creatures, such as the Loch Ness monster and singing mermaids. Students use a variety of sources to craft their own accounts of monster sightings in formats such as illustrated newspaper accounts, live reports, and short stories.

“The entire staff and instructors are kind, patient, and understanding, and the courses offer topics that kids can really dig into.”

—2015 Leapfrog parent
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(1/2) Gods & Goddesses
How did Zeus escape being swallowed by his father? Why is Aphrodite the goddess of love and beauty? In this course, students explore Greek mythology to find answers to questions such as these. As participants read and discuss stories they strengthen their vocabulary, comprehension, and analytical skills. Students create their own stories as they explore events and natural phenomena through the actions of gods and goddesses, synthesizing their newfound knowledge.

(2/3) Castles & Dragons
The colorful history of Medieval England comes alive through the legends and stories of knights and quests. After gaining a base knowledge of medieval history through research, students collaborate to create their own projects representing the ideas and stories that have captured their imaginations.

Mathematics Courses
Students with strong math ability may enroll in a Mathematics course. Courses correspond to a child’s grade level as of January 1, 2016.

Week 3 (July 11-15)
Codes & Symbols
The world is full of codes and symbols, and math skills help decipher them! From number patterns to complex ciphers, young code breakers develop strategies and discover the secrets behind a fascinating variety of codes.

(PreK/K) Top Secret Numbers
How many different ways can a mathematician write or show the concept of “three”? A numeral is just one symbol that represents a certain quantity. Amazing secrets are revealed as students practice identifying and using symbol systems to create math problems, patterns, and codes.

(K/1) Extreme Code Breaking
Breaking a code often involves identifying a pattern. Morse code, for example, is a pattern of dots and dashes. Students identify patterns of numbers, words, letters, and symbols and apply what they have learned to create and crack increasingly complex secret codes.

(1/2) Math for Spies
There’s more to being a spy than just wearing a disguise. Spies also have to be expert mathematicians. In this course, aspiring spies use math to create secret codes, plot the coordinates of enemy hideouts and discover, through logical reasoning, the identities of other spies.

NEW! (2/3) Intro to Cryptography
Savvy mathematicians protect their secrets from spies and hackers through encryption and passwords. This course introduces cryptography and explores how to create and use strong passwords. Students will develop the high-level math and critical thinking skills necessary to consider when and how to use encryption.

(PreK/K) Puzzle Party: Riddles, Mazes & More
Puzzles, tangrams, mazes, and riddles challenge students to seek solutions using computation, logic, and deduction.

(K/1) Think Tank: Games for Brains
Complex games and tough-to-solve problems are no match for students armed with the estimation and reasoning skills they develop in this course.

Week 4 (July 18-22)
Puzzles & Games
Find the right strategy and a solution will emerge! With a focus on logical thinking, young mathematicians use reasoning, estimation, and mental math skills as they play games, work through puzzles, and tackle word problems.

(PreK/K) Mind Boggles: Predictions & Probability
Students’ analytical skills are challenged as they make educated predictions and consider probability—all in the context of word problems, chance games, and brain teasers.

(PreK/K) Coins & Currency: Money in Our World
Money doesn’t grow on trees! Students in this course learn where money actually comes from and its role in the world. Course participants strengthen their computation skills as they explore and compare different currencies, learn the basics of exchange and value, and practice counting and making change through games and simulations.

Week 5 (July 25-29)
Dollars & Cents: Business Basics
Why do you need money? How do you make money? What does it take to create a successful business? From working with budgets, currencies, and systems for tracking success to analyzing profit/loss and supply/demand relationships, participants learn about finance and business while applying their mathematical skills.

(PreK/K) Brain Twisters: Multiplication & Fractions
Sometimes solving a math problem is like untangling a knot. Sound strategy and persistence are the keys to success! In this class, mathematical challenges keep young minds churning as they use fractions and multiplication to arrive at solutions.
A penny saved is a penny earned.”—Benjamin Franklin.

(1/2) Business Start Up
Is your business making money? To answer that question, students create a kid business and set up a budget for their new enterprise. From considering supply and demand to calculating costs and paying employees (and, hopefully, turning a profit), students advance their creative-thinking, problem-solving, and computation skills as they learn about building a business budget.

(2/3) Taking Stock: The Ins & Outs of the Stock Market
What is the stock market? Why do people invest money? Students explore these questions and more as they learn about stock shares, dividends, stockbrokers, stockholders, and stock exchanges. Students invest their computational and critical-thinking skills as they assume roles in a mock stock exchange.

Science Courses
Students with strong verbal/reading or math ability may enroll in a Science course. Courses correspond to a child’s grade level as of January 1, 2016.

Week 3 (July 11-15)
Life Science
What do living things need to survive? How do different body systems work? Through investigations and simulations, course participants explore environments and systems of living things to discover the fascinating processes that keep them alive and thriving. Students are exposed to fundamental principles of life science, preparing them for more advanced explorations in biology and other related fields.

(PreK/K) Zoo Vets
Junior veterinarians classify and compare animals, with a focus on the unique needs and characteristics of wild animals living in zoos. Students also examine the importance of creating zoo habitats and diets that keep animals healthy and reflect the animal’s life in the wild.

(K/1) Blood & Bones: The Human Body
Young biologists investigate the systems of cells circulating within humans. Activities range from creating models of cells and organs to using inquiry to explore the effects of exercise on circulation.

(1/2) Grossology: Fascinating Systems of the Human Body
Gross, grosser, and grossest…. The human body conducts fascinating and seemingly repulsive functions, but all serve a valuable purpose! From spit and vomit to sweat and snot, curious students engage in experiments and activities to study the various systems of the human body, the functions they serve, and the outcomes they produce. Discussions, research, and collaborative projects further challenge students to think critically and synthesize information.

(2/3) Brain Surgery
Young neurologists “go inside” the brain to analyze its systems and understand its connection to the rest of the body. Among other activities, students map the brain, experiment with senses, and use interactive web tools to investigate this amazing and complex organ.

Week 4 (July 18-22)
Architecture & Engineering
What principles of physics, architecture, and engineering are behind some of the world’s greatest structures? In these courses, activities focus on learning about the origins and construction of existing structures built all around the globe. Through hands-on investigation and inquiry, students are provided with an excellent foundation for future scientific investigations in physics and engineering.

(PreK/K) Building Bridges
Truss, arch, suspension, and more—young engineers learn about bridge structures and study famous examples from around the world. Students create their own bridge models based on the principles of physics and through the process of scientific inquiry.

(K/1) Digging Canals & Tunnels
From the canals of Italy, Egypt, and Panama to tunnels for cars, water, and power lines, aspiring engineers consider the development of these critical transportation systems. Students design and construct models and explain their planning process to peers and instructors.

(1/2) Designing Sailing Ships
Following in the footsteps of naval architects, novice designers examine the different methods of assembling ships complete with keels, hulls, and masts. Students implement and test their designs, evaluating the strengths and weaknesses of their ships.

(2/3) Raising Skyscrapers & Towers
How do you build a 200-story building so it won’t topple? How does wind influence an architect’s design? Student architects must answer these questions and others as they uncover the engineering and physics behind tall towers and stupendous skyscrapers.

Week 5 (July 25-29)
Brilliant Blunders
Mistakes are essential to scientific progress. Scientists know that we learn more when things go wrong than when everything runs smoothly. Students take a look at the brilliant blunders of successful scientists and create their own amazing messes and disasters through classroom experiments and multimedia research.

(PreK/K) Surprising Spills & Messes
Pour! Stir! Spill! Students create their own crazy concoctions, observe the amazing messes that result, and document their discoveries and conclusions. Aspiring scientists explore the properties of liquids and solids, as well as the benefits of unexpected and intriguing outcomes.
Learn Coding & Robotics!
Innovative Leapfrog Tech Courses

CTD Summer Program offers technology courses at all grade levels, starting at PreK. Leapfrog tech courses introduce young students to concepts of computer programming and robotics engineering through stories, games, and more. Courses develop a foundation of coding and problem-solving skills. Students spend approximately one-third of each class session using tech devices such as tablets and laptops; the majority of students’ time is spent interacting with other students and engaging in hands-on learning activities that teach coding concepts such as sequence, loop, function, and conditions.

Computer Science & Technology

Students with strong verbal/reading or math ability may enroll in a Computer Science & Technology course. Courses correspond to a child’s grade level as of January 1, 2016. See course charts for course availability per site and week. For all-day technology course descriptions, see page 17.

Tech Tales Animation
Authors find inspiration for stories everywhere. In Leapfrog animation courses, students seek inspiration for their own stories through games, dramatic play, and books as they learn to animate their creations using educational apps and computer programs. Along the way, students learn the fundamentals of coding, such as creating a sequence of commands and trouble-shooting their programs for accuracy and efficiency.

NEW! (1/2) Science Spin-Offs
Did you know scientists have used material made by NASA for tracking missiles in space to design invisible braces for teeth? Many technologies created for one purpose are transformed by scientists to benefit people in new ways. In this course students use their creativity and science skills to reimagine uses for various technologies. Students get a chance to work together to make their own science spin-offs.

(PreK/K) Story Code Alpha
Stories can be shared in many ways: through a book, on stage, or even through computer animation. Students use touch screens and educational apps, such as Daisy the Dinosaur and Kodable, to learn introductory programming and coding concepts such as block, symbol, and sequence.

(K/1) Story Code Beta
Scratch Jr. is the newest version of the educational Scratch programming language developed by the MIT Media Lab. Young programmers use Scratch Jr.—as well as traditional methods like drawing, writing, and dramatization—to bring their stories to life.

(1/2) Story Code Gamma
How is a story on paper different from a story on a computer screen? Students use creativity and critical thinking to develop and present stories using apps such as Scratch Jr. and Hopscotch.

(2/3) Story Code Delta
Students create detailed narratives with multiple characters and settings. They learn to animate their stories using Scratch Jr. and/or the original Scratch programming language.

(PreK/K) Bee-Bot® Town
Bee-Bots® are educational robots designed to introduce young children to computer programming. Students practice and demonstrate introductory coding concepts such as symbol, sequence, and loop as they create homes and roads for their Bee-Bot® friends.

(K/1) Primo Paths
“Tangible programming” means students use devices and objects they can move, manipulate and hold to create computer codes. One example is the Primo Cubetto robot, which students control by using colorful blocks to create a sequence of commands. In this course, students are also introduced to the coding concept of function.

(1/2) Hexbug® Habitats
Hexbug® toys are a fascinating example of bio-inspired robotics, the study of how to make robots that simulate living organisms. Students analyze the form and function of various Hexbug® creatures and build habitats that demonstrate each robot’s unique characteristics, such as sensors and tentacles.

(2/3) WeDo Go!
Students build and program simple robots using LEGO® WeDo robotics kits. This course provides an introductory pathway to more advanced LEGO® robotics experiences.
Leapfrog All-day Courses

New! Expanded options for all-day courses!

All-day Leapfrog courses are weeklong experiences that introduce students to a topic of interest and foster critical and creative thinking through interactive, project-based activities. Most Leapfrog all-day courses are for students in grades 2 and 3. At our Evanston site, we are piloting a new all-day option for younger students, The Science of Treasure Hunting, for grades 1 and 2.

All-day students take a single course that meets approximately five-and-a-half hours a day, allowing for focused study. All-day courses meet from 9:15 a.m. to 3:45 p.m., Monday through Friday.

Leapfrog All-day Course Reference Chart
Grades 1-3
Grade levels are shown in parentheses following the course title.

<table>
<thead>
<tr>
<th>SITE</th>
<th>WEEK 3 JULY 11-15</th>
<th>WEEK 4 JULY 18-22</th>
<th>WEEK 5 JULY 25-29</th>
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<tbody>
<tr>
<td>Chicago</td>
<td>Digital Game Design (2/3) LEGO® Metropolis (2/3)</td>
<td>Tech Power Scratch (2/3) X-Ray Vision (2/3)</td>
<td>WeDo Plus (2/3) Geometry Doodle (2/3)</td>
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<td>Lake Forest</td>
<td>WeDo Plus (2/3)</td>
<td>Wilderness Challenge (2/3)</td>
<td>Digital Game Design (2/3)</td>
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<tr>
<td>Naperville</td>
<td>Digital Game Design (2/3)</td>
<td>WeDo Plus (2/3) Geometry Doodle (2/3)</td>
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<tr>
<td>Palatine</td>
<td>X-Ray Vision (2/3)</td>
<td>Digital Game Design (2/3)</td>
<td>LEGO® Metropolis (2/3)</td>
</tr>
<tr>
<td>Evanston</td>
<td>Tech Power Scratch (2/3) Geometry Doodle (2/3)</td>
<td>Science of Treasure Hunting (1/2) LEGO® Metropolis (2/3) Girl Power Scratch (2/3)</td>
<td>Story Power Animation (2/3) X-Ray Vision (2/3)</td>
</tr>
</tbody>
</table>

Leapfrog
All-day Course Descriptions

English & Language Arts
Students with strong verbal or reading ability may enroll in an English & Language Arts course. Courses correspond to a child's grade level as of January 1, 2016. See course charts for course availability per site and week.

(2/3) Story Power Animation
Make your stories come alive with animation! Students write and edit original narratives and record their work as audio tracks. These recordings are then used to create animated shorts based on hand-drawn, collage, or computer-generated illustrations.

NOTE: Additional $25 materials fee is required.

Mathematics
Students with strong mathematical ability may enroll in a Mathematics course. Courses correspond to a child's grade level as of January 1, 2016. See course charts for course availability per site and week.

NEW! (2/3) Geometry Doodle
Recreational mathematicians like Vi Hart advocate for doodling as an effective method to explore math concepts such as hexaflexagons, binary trees and fractals. Student doodlers will draw, fold, and sculpt two- and three-dimensional creations using math tools, art supplies, and 3D printing pens. Activities introduce fascinating topics in geometry and other areas of mathematics.

Science
Students with strong math or verbal/reading ability may enroll in a Science course. Courses correspond to a child's grade level as of January 1, 2016. See course charts for course availability per site and week.

NEW! (1/2) The Science of Treasure Hunting
Are you ready for a science-based treasure hunt? From metal detectors to GPS, students dig deep as they research the world of hidden treasure and treasure-hunting methods. Topics of study include magnets, electricity, and electromagnetism as students work to understand how a metal detector works and build a model of a working metal detector. Geocaching methods and global positioning systems (GPS) will also be used to find hidden treasures.
Outdoor challenges require determination, self-reliance, and knowledge of math and science concepts. Students learn about outdoor resources for food, water, and shelter. They create solar ovens to cook food and learn methods for purifying water. In addition, students build a shelter using basic, sometimes found, materials. This hands-on course combines classroom time and outdoor learning. Please wear clothes that can get dirty.

NEW! (2/3) X-Ray Vision & Other True Tales
21st century scientists can see in the dark, through solid objects, underwater, and under your skin. In this course, students research and recreate innovative processes for expanding and enhancing human vision to accomplish superhuman tasks. Hands-on experiments include simulating radar or sonar techniques and testing night vision goggles.

Design & Engineering
Students with strong math or verbal/reading ability may enroll in a Design & Engineering course. Courses correspond to a child's grade level as of January 1, 2016. See course charts for course availability per site and week.

(2/3) LEGO® Metropolis: Urban Design & Architecture
Imagine a whole city made out of LEGO® bricks! Introductory urban design and architecture concepts come to life when students collaborate to plan and create buildings, roads, and city infrastructures out of LEGO®s. Course activities include producing blueprints and maps, researching urban planning in real cities such as Chicago, and brainstorming solutions to design and engineering challenges.

(2/3) WeDo Plus! Building, Programming & Modifying Robots
The LEGO® WeDo robotics system engages students in technology experiments that explore science, mathematics, social studies, and language concepts. Using icon-based programming software, students write and download programs to LEGO® robots allowing them to manipulate the movements of their models. This course is similar to the CTD SEP course WeDo Robotics. There are no prerequisites for this course.

Computer Science & Technology
Students with strong math or verbal ability may enroll in a Computer Science & Technology course. Courses correspond to a child's grade level as of January 1, 2016. See course charts for course availability per site and week.

(2/3) Tech Power Scratch
Animation is all around us: in movies, on the Internet, even on our phones. In this hands-on course students learn fundamental computer animation using Scratch, a programming language designed to help young people produce rich interactive media. Skill development includes basic drawing tools as well as simple animations, graphic morphing, and graphic layering. Students create a brief animation program to share at the Expo! After completing this course, students are prepared for more advanced animation and program design work.

NOTE: Additional $25 lab fee is required.

(2/3) Girl Power Scratch
This is the same animation course as Tech Power Scratch but taught but in a girl-positive learning environment. The girl-centric format is designed to help develop girls’ leadership skills and encourage achievement in science and technology.

NOTE: Additional $25 lab fee is required.

(2/3) Digital Game Design
Creating your own video games develops programming skills and design thinking. Aspiring game designers use tools such as Gamestar Mechanic to design, test, and play their own digital games. Course concepts include game planning, character movement, level design, and playability.

NOTE: Additional $25 lab fee is required.

“Leapfrog gives students an early experience in subjects that they would otherwise not be exposed to until later in their academic lives.”

—2015 Leapfrog parent
Spark Program

Grade 3 or 4

(grade level on January 1, 2016)

Spark is a weeklong enrichment program that introduces a topic of interest and fosters critical and creative thinking through interactive, project-based activities. Students in the Spark program take a single course that meets approximately five-and-a-half hours a day, allowing for focused study. The Spark program culminates with an Expo! of student work.

Apply early! Application period begins January 4, 2016.

Courses are offered at Elmhurst College and at Leapfrog sites, including Chicago, Lake Forest, Naperville, Palatine and Evanston, Illinois. For specific locations, please see the Summer Program website.

Select course topics that best fit your child’s academic strengths as determined through test scores and other academic measures.

SPARK: Grades 3 & 4

<table>
<thead>
<tr>
<th>SITE</th>
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<th>JUNE 20-24</th>
<th>JUNE 27-JULY 1</th>
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<tbody>
<tr>
<td>Elmhurst</td>
<td>Pen to Podium</td>
<td>How Things Work</td>
<td>Survivor Math</td>
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<td></td>
<td>Big Bang &amp; Beyond</td>
<td>Photoshop Workshop</td>
<td>Design Engineering with</td>
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<td></td>
<td>Robotics Lab</td>
<td>Girl Power Robotics Lab</td>
<td>Board Games</td>
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<td>Girl Power Web Design</td>
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<tr>
<th>SITE</th>
<th>JULY 11-15</th>
<th>JULY 18-22</th>
<th>JULY 25-29</th>
</tr>
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<tbody>
<tr>
<td>Chicago</td>
<td>Survivor Math</td>
<td>Robotics Lab</td>
<td>Girl Power Web Design</td>
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<tr>
<td>Evanston</td>
<td>Paper Airplane Design</td>
<td>Invention Convention</td>
<td>Robotics Lab</td>
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<td>How Things Work</td>
<td>Pen to Podium</td>
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<td>Girl Power Web Design</td>
<td>Survivor Math</td>
<td>Pen to Podium</td>
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<tr>
<td></td>
<td>Vote for Willie the Wildcat!</td>
<td>Paper Airplane Design</td>
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<tr>
<td>Naperville</td>
<td>Robotics Lab</td>
<td>How Things Work</td>
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</table>

Spark Course Descriptions

English & Language Arts

Students with strong verbal or reading ability may enroll in an English & Language Arts course. See course charts for course availability per site and week.

Pen to Podium: Expert Writing & Speaking

Would you use the same approach to write a school essay on the importance of the Bill of Rights as you would to convince your parents to buy you a dog? Does a well-written essay always make an effective oral argument? Essays and speeches must be strategically crafted to make the greatest impact, and in this course you will explore rhetorical devices and techniques to construct strong written pieces and deliver excellent speeches with arguments that will appeal to ear, mind, and heart.
NEW! Vote for Willie the Wildcat! A Special Election-Year Offering
Election campaigns bring together people with a wide variety of talents and interests to work for a common goal. Take on the roles of key campaign staff for Willie the Wildcat, Northwestern University mascot, a fictional candidate with a kid-friendly environmental platform. As a member of Willie’s staff, conduct research to determine policy positions, analyze polling and fundraising data, and learn how best to communicate messages to the voters. Develop analytical and communication skills as you are introduced to game theory and political science.

Mathematics
Students with strong mathematical ability may enroll in a Mathematics course. See course charts for course availability per site and week.

Survivor Math
Math is the key to survival in this creative problem-solving course. Role-play a variety of dramatic scenarios, such as being marooned on a desert island, trapped in a space station, cornered by an enemy army, or stranded in a deadly snowstorm, and save the day using geometry, algebraic thinking, probability, measurement, and more.

Science
Students with strong math or verbal/reading ability may enroll in a Science course. See course charts for course availability per site and week.

NEW! Big Bang & Beyond!
The history of the universe is mystifying, but cosmologists are using cutting-edge science successfully to decipher it. From the Big Bang to dark matter, take on the role of scientist to discover what’s “out there!” Follow the latest NASA missions, learn about technology used to gather data from outer space, and apply the scientific skills that astronomers use everyday to better understand our universe.

NEW! Paper Airplane Design: A Study in Aerodynamics
Aerodynamics describes how air moves around a solid body — in this case, a paper airplane. Design and fly airplanes in response to increasingly complex challenges. Experiments will include testing a remote-controlled paper airplane with specialized propellers and rudders.

Design & Engineering
Students with strong math or verbal/reading ability may enroll in a Design & Engineering course. See course charts for course availability per site and week.

Design Engineering with Board Games
Designers of Euro-style board games transport players to exciting settings, imaginary and historical, and place them in scenarios that require deep thinking on the way to victory. Designing a board game that is appealing and engaging requires creativity, logic, analysis, and innovation, as well as principles of design such as prototyping, testing, and gathering feedback. Put these concepts to work as you refine your game themes and mechanics to maximize fun!

Robotics Lab: Recording & Sharing EV3 Experiments
Develop engineering and computer science knowledge and skills as you build and program robots using LEGO® EV3 robotics kits, and apply introductory scientific research skills as you record and document your projects with both word and image. This course is the whole package: hands-on experience with technology and preparation for scientific research with traditional lab experiments.

NOTE: Additional $25 materials fee is required.

Girl Power Robotics Lab: Recording & Sharing EV3 Experiments
The same course as Robotics Lab, but taught in a girls-only learning environment. This format is designed to help develop girls’ leadership skills and encourage achievement in science and technology.

NOTE: Additional $25 lab fee is required.

How Things Work: Electronics
How does a television work? What’s inside your computer or cell phone? We love working and playing with high-tech gadgets, but how often do you stop to think about how these tools actually function? In this inquiry-based course, safely dismantle consumer electronics to discover how they work, examine the development and use of these items, and discuss how they might be improved in the future. Through research, experimentation, collaboration, create and build simple electronic machines and circuits of your own.

NOTE: Additional $25 materials fee is required.

Invention Convention: Ingenious Engineering
Humans continually invent new ways to make their lives easier, safer and more interesting. We create new and improved toys and games. We figure out more efficient ways to transport our stuff and ourselves. Channel your creative instincts by brainstorming, designing, and constructing inventions. The work begins with the study of great inventors and how and why certain products or machines were invented. After brainstorming ideas, develop your own invention, plan how to make it, and then create and test your product.

NOTE: Additional $25 materials fee is required.

Computer Science & Technology
Students with strong math or verbal ability may enroll in a Computer Science & Technology course. See course charts for course availability per site and week.

Photoshop Workshop: A Digital Studio
Artists create pictures digitally using software that brings their ideas to life. Photoshop is frequently used by web designers because its tools are sophisticated enough to create digital paintings and drawings that look like they were done by hand. Dive into Photoshop to discover what makes up a digital image and then master the program’s tools to create your own pictures. Develop technical skills through hands on activities that draw on your creativity and artistic ability.

NOTE: Additional $25 lab fee is required.

Girl Power Web Design
Explore current web design tools and Photoshop in a hands-on, project-based, girl-positive learning environment. Delve into the design process through introductions to fun and powerful software, including Flash, Adobe Dreamweaver and Notepad++.

NOTE: Additional $25 lab fee is required.
Solstice Program

Grades 4-6
(grade level on January 1, 2016)

New in 2016: Solstice at Elmhurst College includes a residential option for Session 1!

Solstice is a two-week enrichment program for students in grades 4, 5, or 6 that provides deep exploration of an existing and complex topic of study. Students problem solve and hone study skills as they complete course projects. Students in the Solstice program take a single course that meets approximately five-and-a-half hours a day, allowing for focus and depth. The Solstice program culminates with an Expo! of student work.

Solstice is offered at Elmhurst College in Elmhurst, Illinois and at Northwestern University’s Evanston, Illinois campus. Both locations now offer residential and commuter options and a wide array of course offerings. Taking courses while residing on a college campus affords students ready for a residential experience the chance to be introduced to college in a safe and structured way.

Apply early! Application period begins January 4, 2016.

Elmhurst College, Elmhurst, IL

Session 1: June 12-24 (residential or commuter)

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<td>Sketch Comedy &amp; Improvisation</td>
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<td>16</td>
<td>Topics in Pre-Algebra</td>
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<td>18</td>
<td>Breakout Biology: Infectious Disease</td>
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<td>20</td>
<td>Cool Chemical Capers</td>
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<td>26</td>
<td>Android Applications &amp; Computer Programming</td>
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Session 2: June 27-July 8 (commuter only)

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<td>Introduction to Genetics</td>
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<td>Phun Physics: Industrious Engineering</td>
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<td>Minecraft</td>
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<td>Stop-Motion Storytelling</td>
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Northwestern University, Evanston, IL (residential or commuter)

Session 1: June 26-July 8

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<td>13</td>
<td>Money on the Brain: Behavioral Economics</td>
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<td>Topics in Pre-Algebra</td>
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<td>20</td>
<td>Cool Chemical Capers</td>
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<tr>
<td>23</td>
<td>Get Smart! Spies, Gadgets &amp; Intelligence Organizations</td>
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<tr>
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<td>Android Applications &amp; Computer Programming</td>
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Session 2: July 10-22

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<td>14</td>
<td>Road to the White House</td>
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<tr>
<td>17</td>
<td>Math Madness!</td>
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<td>Minecraft</td>
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Session 3: July 24-August 5

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<td>Android Applications &amp; Computer Programming</td>
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</table>
Solstice Course Descriptions

English & Language Arts

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 90th national percentile rank in verbal or reading on standardized achievement test; OR Admission Portfolio

10. 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 not yet realized to extend the stories. Projects involve creative writing, drawing, and constructing three-dimensional structures.
OFFERED: NU

12. Sketch Comedy & Improvisation
Attention class clowns and quick wits! Put your sense of humor to work and craft comedic scenes and sketches with strong characters, plots, and dialogue. Through improvisation and writing that encourages creative thinking, generate comedic material in a variety of formats. Develop your ideas through peer critiques, learn basic comedic vocabulary, and develop timing, confidence, and collaborative skills.
OFFERED: NU & EC

Social Sciences & Humanities

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 90th national percentile rank in verbal or reading on standardized achievement test; OR Admission Portfolio.

NEW! 11. Debate & Discourse: Current Events
Want people to hear what you have to say? Learn the art of public speaking and of debate in a class that will sharpen your presentation skills, refine your arguments, and broaden your thinking. Research positions on important issues and current events, and learn to present your ideas effectively by exploring different debate styles and analyzing professional debates. Examine examples such as NPR’s Intelligence Squared U.S. and presidential debates.
NOTE: This course requires students to bring either a laptop computer or a tablet for research and writing.
OFFERED: NU

13. Money on the Brain: Behavioral Economics
“Free” can cost you, and too many options can distract you from the best choice. Through research, experiments, and statistical analysis, explore what happens when emotion and persuasion meet market forces and decide if our decisions about money make sense.
OFFERED: NU

NEW! 14. Road to the White House
What does it take to get to the Oval Office? Investigate the different roads U.S. presidents took to 1600 Pennsylvania Avenue, and examine the rules and requirements for becoming president. Engage in a mock campaign process to solidify your understanding of the political system: establish your candidacy and platform, build a “war chest,” make critical decisions, prepare for and participate in debates, and write speeches.
NOTE: This course requires students to bring either a laptop computer or a tablet for research and writing.
OFFERED: NU

15. Mount Olympus to Asgard: Myth, Legend & Percy Jackson
“A myth is a way of making sense in a senseless world.”—Rollo May
Discover the purposes of myth for the world’s ancient civilizations and explore how those myths are found in contemporary literature, film, and other media. Explore the art of storytelling, discuss mythology, and examine oral tradition as you experiment with creative performance and come to understand the mythologies of ancient times.
OFFERED: NU

Mathematics

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 90th national percentile rank in quantitative or math on standardized achievement test; OR Admission Portfolio

16. Topics in Pre-Algebra
This introduction to Pre-Algebra surveys 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 intended specifically for advanced math students who want a preview of Pre-Algebra for future study.
OFFERED: NU & EC

17. Math Madness!
Caution: the problems in this course may drive you wild! Armed with motivation, persistence, and problem-solving skills, you’re bound to triumph. Learn concepts ranging from pre-algebra, algebra and geometry and utilize a wide range of problem-solving tactics to tackle problems from the Art of Problem Solving series. OFFERED: NU & EC

Science

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 90th national percentile rank in standardized achievement test (see course descriptions for qualifying subject area); OR Admission Portfolio

23. Get Smart! Spies, Gadgets & Intelligence Organizations
Human societies have developed intelligence networks to protect domestic secrets and themselves against threats using cryptography and code breaking, remote sensing, and surveillance. If you are interested in the world of espionage, you will enjoy exploring the history, math, and science behind intelligence gathering, researching spies and famous missions, and developing your own plans, codes, and gadgets.
OFFERED: NU
QUALIFYING SCORE: Math or Verbal/Reading

NEW! 25. Sports in Motion
It takes more than muscle to be an athlete. From the best angle for a punt, to the role of geometry in dance, sports and science are intertwined. Learn how physics, biology, chemistry, and math all factor into how your favorite sports stars play at their maximum potential. Hands-on experiments, research, and problem solving will all play a part in this winning course.
OFFERED: NU
QUALIFYING SCORE: Math
20. Cool Chemical Capers
How does soap remove dirt? What preserves packaged cupcakes? These and other everyday mysteries are the basis of this inquiry-based introduction to chemistry. Investigate the properties of various elements and learn what causes or prevents chemical reactions through hands-on experiments in a laboratory setting, and learn how substances can be classified by their properties, including melting temperature, density, hardness, and thermal and electrical conductivity.

NOTE: Additional $75 lab & materials fee required.
OFFERED: NU & EC
QUALIFYING SCORE: Math

18. Breakout Biology: Infectious Disease
Infectious diseases have plagued and puzzled humanity from the beginning of time, and from the common cold to Ebola they continue to roam our planet. Question and hypothesize, identify and manipulate variables, observe, measure and record data, and analyze and interpret results as you learn about the fields of microbiology, immunology and epidemiology and investigate how the human immune system works to keep us healthy.

NOTES:
• Additional $75 lab & materials fee required.
• At the Northwestern University location, this course will use classroom and laboratory space at Roycemore School.

OFFERED: NU & EC
QUALIFYING SCORE: Verbal/Reading

19. Introduction to Genetics
What does it mean when someone says, “it’s in the genes”? Genes help 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 of genetics (including the Human Genome Project), and consider the ethical, legal, and medical issues involved in genetic modification.

NOTES:
• Additional $75 lab & materials fee required.
• At the Northwestern University location, this course will use classroom and laboratory space at Roycemore School.

OFFERED: NU & EC
QUALIFYING SCORE: Verbal/Reading

21. Phun Physics: Industrious Engineering
How would you create a high-flying projectile launcher or the farthest rolling mousetrap car? Put your ideas to the test in this hands-on introduction to physics and engineering! In individual and group build projects, explore physics concepts such as force, acceleration, potential and kinetic energy, and torque and apply them to the creation of cars, bridges, catapults and more. This class is a great preparatory experience for students interested in Science Olympiad events.

NOTE: Additional $75 lab & materials fee required.
OFFERED: NU & EC
QUALIFYING SCORE: Math

12. Roller Coaster Physics
How does an amusement park ride make you feel lighter than air in one moment and press you down into your seat in the next, all while keeping you safely inside the ride? Strap yourself in for a fast-paced adventure in the world of physics and investigate topics such as the law of inertia, centripetal acceleration, centrifugal force, and g’s as you design and build a variety of amusement park thrills.

NOTE: Additional $75 lab & materials fee required.
OFFERED: NU
QUALIFYING SCORE: Math

Computer Science & Technology

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 90th national percentile rank in verbal/reading OR in quantitative or math on standardized achievement test; OR Admission Portfolio

NEW! 24. MIDI Mania: Computer Music & Composition
Drop the bass! Learn how modern musicians, producers, and DJs use technology and programming to create the music you hear every day. Then, 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, this class will help advance your musical skills with cutting-edge technology.

NOTES:
• Students are required to bring a laptop computer for use in the course.
• Additional $75 materials fee required.

OFFERED: NU

26. Android Applications & Computer Programming
From Facebook to Angry Birds, mobile applications are used every minute of the day, all over the world. Learn key programming concepts and develop proficiency in drag-and-drop computer programming interfaces such as Scratch, Alice, and Snap, then apply and extend your learning to build apps of your own using the MIT App Inventor.

NOTE: Students are encouraged to bring a personal Android device (such as a tablet or smartphone), but it is not required.

OFFERED: NU & EC

27. 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 a wide variety 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:
• Students are required to bring a laptop computer for use in the course.
• Additional $75 materials fee required.

OFFERED: NU & EC

“"My child benefitted from being with peers that placed such a high level of interest in their academics.” —2015 Summer Program parent
Apogee Program

Grades 4-6
(grade level on January 1, 2016)

Apogee is a three-week, intensive program for students in grades 4, 5, or 6. Apogee courses introduce students to advanced concepts in a particular subject area, helping them to gain new knowledge and develop creative, problem-solving, and study skills in a rigorous, supportive environment.

Apogee students take a single course that meets five-and-a-half hours a day, allowing for focus and depth. The Apogee program culminates with an Expo! of student work and the opportunity to meet individually with course instructors.

A residential option is available. Taking courses while living on the campus of Northwestern University affords students ready for a residential program the opportunity to experience college in a safe and structured way.

There are two different course types offered in Apogee:

- **Enrichment Intensive** (fast-paced, rigorous, non-credit courses designed to allow students to explore specialized subjects in depth)
- **Credit Intensive** (compacted high school honors courses designed to help students accelerate in a particular subject area). Credit Intensive courses include the compacted, full-year Algebra course and Introduction to Java Programming.

Apply early! Application period begins January 4, 2016.
Northwestern University, Evanston, IL
(residential or commuter)

Session 1: June 26-July 15

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<td>Creative Writing: Short Story</td>
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<td>From Page to Stage: Writing, Directing &amp; Performing</td>
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<td>33</td>
<td>History: Gaming the Outcome</td>
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<td>Power &amp; Influence: Practice in Persuasion</td>
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<td>37</td>
<td>Math: Puzzles &amp; Games</td>
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<td>Pre-Algebra Honors (graded)</td>
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<td>Algebra I Honors</td>
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<td>Up, Up &amp; Away: The Science of Aerodynamics &amp; Flight</td>
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<td>Zoology: Classification to Dissection</td>
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<td>Detective Science: An Introduction to Forensics</td>
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INFORMATION CRITERIA: EXPLORE® test; OR ≥ 95th national percentile rank in verbal or reading on standardized achievement test; OR Admission Portfolio

31. Creative Writing: Short Story
In this writing workshop, learn to channel your creative ideas into polished, dynamic short stories. Study and analyze professional writing techniques, practice writing and revising, and present your own work to an audience. Combining elements of great storytelling and the short fiction form, create your own portfolio to take home.
OFFERED: Session 1

32. The Writing Lab
Developing and writing a good essay is a lot like learning chess: it takes mental agility, practice, and a willingness to learn from mistakes. In this workshop-based class, discover how to write various types of essays ranging from expository to persuasive. Through a variety of interactive class and small group activities, practice editing your work critically and incorporating feedback from peers and instructors into your writing. Drafting, revising, and editing techniques will help you produce a portfolio of polished compositions.
OFFERED: Session 2

NEW! 37. Math: Puzzles & Games

Social Sciences & Humanities

INFORMATION CRITERIA: EXPLORE® test; OR ≥ 95th national percentile rank in verbal or reading on standardized achievement test; OR Admission Portfolio

NEW! 33. History: Gaming the Outcome
In this simulation and game-based course, you won’t just learn about history, you’ll play it out! Examine key moments in human history and civilization by taking the perspective of important historical figures, playing roles in government, researching and analyzing primary and secondary sources, and then applying your learning to solve the problems faced by your civilization.
OFFERED: Session 1

NEW! 47. 3D Stories (see course description in the Computer Science & Technology section)
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? An interdisciplinary mix of speaking and writing activities prepares you to take on the varied 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: Session 2

35. Power & Influence: Practice in Persuasion
Are you tired of wearing a uniform to school every day? Do you think you need the latest tablet or smartphone? Learn how to convince your parents or school principal to see things from your perspective. This introduction to persuasive speaking develops the skills needed to participate in debate, mock trial, and forensic competitions. Work on developing comfort with delivery as you perform pre-written essays, stories, and speeches. Then, learn to choose appropriate topics, form compelling introductions, and locate convincing evidence to support your claims. Individual and group work will help you practice debating techniques and explore your own persuasive voice.

OFFERED: Session 1

Mathematics

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 95th national percentile rank in math on standardized achievement test; OR Admission Portfolio (For Graded Pre-Algebra Honors and Algebra I Honors admission criteria, see those course descriptions.)

OFFERED: Session 1

Do you dream of presenting and defending your invention to the Shark Tank panel? In this innovative, exciting course, you’ll work on collaborative teams to develop, test, and market your problem-solving products in this project-based class. Through workshops and simulations, work to understand product needs, marketing, materials, engineering, design, and business presentation skills. Readings and discussions build knowledge of fundamental economics concepts and entrepreneurship terminology.

OFFERED: Session 2

37. Math: Puzzles & Games
In a library drop box, there are 8 novels, 8 biographies, and 8 history books. If Jasmine selects two books at random, what is the probability that she will select two different kinds of books in a row? Examine a variety of critical math topics through the lens of puzzles and games including chess, modern strategy games, and card and carnival games of chance. Concepts come from algebra and geometry and include inductive reasoning and an advanced exploration of probability and statistics. Design and develop your own carnival game as a culminating project, applying the statistical and probabilistic concepts learned in class.

OFFERED: Session 1

38. Everyday Calculus
Where can we find calculus in the world around us? Since calculus is the mathematical study of change, the answer is: everywhere! Enthusiasm, not expertise, is required for this introduction to calculus topics. Through direct instruction, hands-on activities, and exploration of real-world examples, learn about functions, limits, derivatives, and integrals. Discover—and learn how to explain—that we are, in fact, immersed in a world that calculus describes! No prerequisite math courses are required, but prior experience with exponents, multiplying negatives, and simplifying basic algebraic expressions is recommended.

NOTE: A scientific or graphing calculator is required for this course.

OFFERED: Session 2

39. Pre-Algebra Honors (Graded)
PREREQUISITES: EXPLORE® Math ≥17; OR ACT® M ≥22; OR SAT® M ≥520; OR Admission Portfolio with test scores at the 99th national percentile rank in quantitative or math section on a standardized achievement test
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 builds upon the essential skills of arithmetic as they apply to algebra and 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.

OFFERED: Session 1

40. Algebra I Honors (Graded)
PREREQUISITES: EXPLORE® Math ≥17; OR ACT® M ≥22; OR SAT® M ≥520; OR Admission Portfolio with test scores at the 99th national percentile rank in quantitative or math section on a standardized achievement test; completion of full-year Pre-Algebra curriculum
This course is intended for students who have already studied the introductory ideas of algebra and are ready to extend their knowledge in a full-year course. Algebra I Honors is an honors-level high school mathematics course covering equations and functions, properties of real numbers, solving and graphing linear equations and functions, solving and graphing linear inequalities, exponents and exponential functions, polynomials and factoring, quadratic equations and functions, radicals and geometry connections, and rational equations and functions. Students who complete this course are prepared for Algebra II.

NOTE: This course is cross-listed with Spectrum.

OFFERED: Session 1 & 2
42. Chem Lab: It’s Elemental
You might already know what happens when you combine baking soda (a bicarbonate) and vinegar (an acetic acid), but have you ever seen a gummy bear dance with potassium chlorate? Do you know why these reactions happen? 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.

NOTE: Additional $125 lab & materials fee required.
OFFERED: Session 2
QUALIFYING SCORE: Math

43. Zoology: Classification to Dissection
From a bat the size of a raspberry to a bird-eating vampire frog, new animal species are discovered nearly every day. How do scientists classify these new species? In this laboratory-based course, learn the basics of animal biology related to structure and physiology. Investigate evolutionary mechanisms that lead to the diversity of vertebrate and invertebrate animals. While conducting hands-on and virtual dissections and fieldwork, identify, compare and contrast the key features used to classify animals into major groups.

NOTES:
• Additional $125 lab & materials fee required.
• This course will use classroom and lab space at Roycemore School.
OFFERED: Session 1
QUALIFYING SCORE: Reading/Verbal

44. Journey through the Cosmos: Space & Astrophysics
Do you dream of being aboard Dr. Who’s TARDIS, probing the possibility of life on a newly discovered planet? In this stellar science class, explore black holes, dark matter and dark energy, mysterious eruptions from the sun, gamma ray bursts, cannibalistic stars, and galactic collisions. Learn about the latest NASA missions and new technology used to gather data from the farthest corners of the universe. Apply the physics behind each topic and research the latest findings on phenomena beyond our solar system.

OFFERED: Session 2
QUALIFYING SCORE: Reading/Verbal

45. Detective Science: An 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 and still is for the detectives of popular TV dramas. Learn the forensic science involved in solving crimes, including how to collect fingerprints, crack secret codes, and examine corrosion evidence. Topics from earth sciences, technology, life sciences, psychology, literary analysis, and physical sciences are combined to solve complex mysteries.
NOTE: Additional $125 materials fee required.
OFFERED: Session 1
QUALIFYING SCORE: Reading/Verbal

Computer Science & Technology

ADMISSION CRITERIA: EXPLORE® test; OR ≥ 95th national percentile rank in math on standardized achievement test; OR Admission Portfolio

NEW! 46. Raspberry Pi
How does a computer work? What exactly does an operating system do? Learn to program and understand how computers work using the customizable mini-computer, Raspberry Pi. Write basic programs to get your computer to do what you tell it to do. Develop your own creative projects and learn why people all over the world are fans of this dynamic microcontroller.

NOTES:
• Additional $125 materials fee required.
• Eligible for Sandra Dennhardt or Gary Greenberg Technology Scholarship; see the Summer Program website for more information.
OFFERED: Session 2

NEW! 47. 3D Stories
Hone your storytelling prowess and learn cutting-edge software that brings your stories to life. This project-based course introduces you to the fundamentals of making great animated short films. Develop engaging storylines to capture an audience. Use powerful 3D graphics software to develop characters and create unique environments. Learn about lighting, angles, and camera movements, and by the end of the course you will have animated your own sequence or short film.
NOTE: Additional $125 lab fee required.
OFFERED: Session 1

48. Web Design: Introduction to HTML & CSS
In this hands-on, project-based course, learn the basic skills, programming concepts and design techniques necessary to develop a fully functional website. Investigate design issues specific to web-based presentations, learn about effective page layout, navigation and text, and delve into the design process. Experience authoring software applications, such
as Notepad++ and Adobe Dreamweaver, to create Hypertext Markup Language (HTML) with Cascading Style Sheets (CSS), Photoshop, Flash, and other available graphics software are used to create images and animation. JavaScript and jQuery may also be introduced.

**NOTES:**
- Additional $125 lab fee required.
- Eligible for Sandra Dennhardt or Gary Greenberg Technology Scholarship; see the Summer Program website for more information.

**OFFERED:** Session 2

**49. 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 is ideal for learning the fundamentals of object-oriented programming, which can be applied to other object-oriented 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 a variety of resources, including video, interactive learning environments, and an online development environment that help you build your own computer games.

**NOTES:**
- Students are required to bring a laptop computer for use in the course.
- Eligible for Sandra Dennhardt or Gary Greenberg Technology Scholarship; see the Summer Program website for more information.

**OFFERED:** Session 2

**50. Introduction to Java Programming Honors**

**ADMISSION CRITERIA:** EXPLORE® M ≥ 17; OR ACT® M ≥ 22; or SAT® M ≥ 520; OR Admission Portfolio with test scores at the 99th national percentile rank in quantitative or math on a standardized achievement test; OR Admission Portfolio with test scores at the 99th national percentile rank in quantitative or math on a standardized achievement test.

**PREREQUISITES:** Pre-Algebra; demonstrated experience in one programming language.

In this course, students are introduced to the Java programming language. As they create games, simulations, and applications, students explore foundational programming concepts applicable to other object-oriented languages including Python, C++, and C#. Utilizing the Greenfoot programming environment, students employ sophisticated data structures and coding strategies to create games and agent-based simulations. Students also use the NetBeans programming environment to develop, review, document and publish several interactive math-oriented applications. This class prepares students to take more advanced programming courses, including Programming in C++ and AP® Computer Science A.

**NOTES:**
- Students are required to bring a laptop computer for use in the course.
- This is a high-school level, graded course cross-listed with Spectrum.
- Eligible for Sandra Dennhardt or Gary Greenberg Technology Scholarship; see the Summer Program website for more information.

**OFFERED:** Session 1 & 2

**NEW! 51. DIY Robotics**
Do you look at piles of junk or a bin full of recycled materials and get inspired to create? Then this is the perfect course! In DIY Robotics, repurposing meets design and engineering in the world of robotics. Using servos, LEDs, motors and sensors, make machines, interactive robots, and kinetic sculptures with found materials as the base. Learn and apply basic electrical engineering principles and experiment with simple computer programming to animate your creations.

**NOTE:** Additional $125 materials fee is required.

**OFFERED:** Session 1 & 2

**52. ROVing Robotics: Exploring the Technology of Unmanned Vehicles**
Is there water on Mars? Yes! But, without the interactive capabilities of the rover Curiosity, scientists would still be wondering. How do unmanned aerial vehicles (UAVs), also known as drones, autonomous underwater vehicles (AUVs) and other remotely operated vehicles (ROVs) work? Explore how ROVs function and the role they play in space exploration, disaster response, atmospheric readings, and agricultural and wildlife surveys. Program and manipulate quad-icopters and other ROVs to discover their capabilities first-hand.

**NOTE:** Additional $125 materials fee is required.

**OFFERED:** Session 2

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

**NOTE:** Additional $125 materials fee is required.

**OFFERED:** Session 1 & 2

**54. Designing Machines That Work: Engineering & Physics**
The Thrust SSC, the English Channel’s Chunnel, and France’s Millau Viaduct all have one thing in common: they are human-made marvels of the world. How did engineers create these marvels and what physics principles were utilized in designing them? In this hands-on 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 your own creative projects, including towers, bridges, and CO2 dragster cars.

**NOTE:** Additional $125 materials fee required.

**OFFERED:** Session 1 & 2

“...” —2015 Apogee student
Spectrum Program

Grades 7 & 8*

(grade level on January 1, 2016)

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

Spectrum provides students a unique opportunity to study one subject in depth at a pace equal to their abilities with peers who share similar interests and abilities.

Spectrum students take a single course that meets five-and-a-half hours a day, allowing for focus and depth.

Most Spectrum courses are three weeks in length, but note that there is also one five-week course option, Build Your Own Computer. This course requires more in-depth study and results in a special certification.

A residential option is available. Taking courses while living on the campus of Northwestern University affords students ready for a residential program the opportunity to experience college in a safe and structured way.

There are two different course types offered in Spectrum:

• **Enrichment Intensive** (fast-paced, rigorous, non-credit courses designed to allow students to explore specialized subjects in depth)

• **Credit Intensive** (credit-bearing, compacted high school honors courses designed to help students accelerate in a particular subject area)

Apply early! Application period begins January 4, 2016.

“The Spectrum community is vibrant, and I had an amazing time here.”

—2015 Spectrum student
Northwestern University, Evanston IL  
(residential or commuter)

### Enrichment Intensive Courses

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<td>56</td>
<td>MegaGames: The Die is Cast</td>
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<td>Forensic Science</td>
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<td>Taking Action: Leadership &amp; Service</td>
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### Credit Intensive Honors Courses

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### 5-Week Session: June 26 – July 29

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Spectrum Enrichment Intensive Course Descriptions

Though not offered for credit, Enrichment Intensive 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.

NEW! 55. Voldemort Lives: Fanfiction Resurrection!
If you have not read the story about Harry and Katniss defeating Jacob's pack despite Bella's fearful objections, it is only because you have not written it yet. Grab your keyboard, let your imagination run wild, and become the newest author in the exploding online genre of fanfiction. Hone your writing and storytelling skills by reading published pieces and identifying the keys to success in this unique genre. Learn to weave your favorite characters into new stories that stay true to their origins but effectively ask and answer the question, "What if the twin did meet?" A piece ready for publication will serve as the capstone project.

SUBJECT: English & Language Arts
OFFERED: Session 1
ADMISSION CRITERIA: EXPLORE® R ≥14; SAT Crit. R ≥440; ACT R ≥19; or Admission Portfolio

NEW! 56. MegaGames: The Die is Cast
From military training to Fortune 500 staff development, games and simulations are used to teach strategic leadership and problem-solving skills and to understand human reactions to complex situations. MegaGames is a worldwide phenomenon in which teams of players take on specific roles—for example, a national government—and interact with other teams representing their opponents or allies. In this course, learn game construction and project management while experiencing MegaGames first-hand. Discover the history of tabletop and roleplaying game design while transporting to different worlds as both player and game master. Focusing on two distinct historical periods—the Low Middle Ages and the 1960s—students will work in teams to research, create, and run their own original MegaGame.

SUBJECT: Social Science & Humanities
OFFERED: Session 2
ADMISSION CRITERIA: EXPLORE® R ≥14; SAT Crit. R ≥440; ACT R ≥19; or Admission Portfolio

57. Forensic Science
Despite what you may see on TV, a lot more than an hour of commercially interrupted hard science goes into cracking any case. Forensic Science examines the application of science to the criminal justice system. Utilizing mini-lectures, in-class discussion, and hands-on activities, students collect, preserve, and analyze crime scene evidence. Experiments and fieldwork provide perfect venues for learning scientific methods, lab procedures, and techniques. Labs may include trace analysis of hair, fiber, stain, epithelial cells, fingerprints, and DNA. This class is an excellent prelude to future science and laboratory coursework.

NOTE: Additional $125 lab fee required.

SUBJECT: Science
OFFERED: Session 1
ADMISSION CRITERIA: EXPLORE® R ≥14; SAT Crit. R ≥440; ACT R ≥19; ACT S ≥18; or Admission Portfolio

58. Competition Math
Do you participate in MATHCOUNTS® or have an interest in competition-based problem solving? Even if you have not joined a math team yet, this course will introduce you to the concepts and techniques of applied math and solving competition math puzzles. Examples of these are seen in AMC, the Art of Problem Solving, and other national math contests. This course covers 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.

SUBJECT: Mathematics
OFFERED: Session 2
ADMISSION CRITERIA: EXPLORE® M ≥15; SAT M ≥460; ACT M ≥18; or Admission Portfolio

59. Taking Action: Leadership & Service
Each year, more than three million Americans experience homelessness, 15 million go hungry, and one in five children struggles in poverty. Why does this happen? What can young people do about it? An offering of CTD’s Civic Education Project, this innovative curriculum integrates academic study with meaningful community service for an experience that participants describe as “eye-opening” and “life-changing.” Students divide time between the classroom and supervised hands-on service projects with community organizations ranging from homeless shelters to Head Start programs to top political offices. Through academic research, small group work, and facilitated reflection, students investigate the root causes and proposed solutions of pressing social problems. Young student leaders gain a deeper understanding of complex social issues and learn how to make a difference in communities. This course enhances communication, critical thinking, and problem-solving abilities and prepares students for a lifetime of leadership and civic engagement.

NOTE: Additional $125 field study fee required.

SUBJECT: Leadership & Service
OFFERED: Sessions 1 & 2
ADMISSION CRITERIA: EXPLORE® R ≥14; SAT Crit. R ≥440; ACT R ≥19; or Admission Portfolio

Credit Intensive Course Descriptions

Credit Intensive courses are rigorous, fast-paced courses taught at the honors level. Students earn grades and are expected to complete a semester or one full academic year’s worth of curriculum in three weeks. Each three-week course carries one or two semesters of high school credit offered through Center for Talent Development (CTD).

English & Language Arts

ADMISSION CRITERIA: EXPLORE® R ≥16; SAT Crit. R ≥510; ACT R ≥22; or Admission Portfolio

NOTE: For all English & Language Arts courses, residential students are highly encouraged to bring a small personal printer.

60. Creative Writing Honors
PREREQUISITE: Graded creative writing assignment
Learn to read, write, and think like a writer through the study of different creative genres that may include 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 writing 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. This course allows developing writers to become more astute readers of literature and to understand more clearly how a writer employs aspects of craft to their creative advantage.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

NEW! 61. Literary Analysis Honors: The Turing Test, Artificial Intelligence & the Human Program
PREREQUISITE: Graded writing assignment
“By far, the greatest danger of artificial intelligence is that people conclude too early that they understand it.” — Eliezer Yudkowsky
From the ancient Greeks onward, authors have explored the ethical dilemmas presented by
artificial intelligence. Through close readings, lively debates, and writing activities, examine what it means to be intelligent, what it means to have a mind, and the implications of creating “intelligent” machines while developing essential literary analysis skills. Readings may include Greek myths and authors such as Mary Shelley, Isaac Asimov, Arthur C. Clarke, and Terry Pratchett, and scientific articles about artificial intelligence. 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.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

62. Literary Analysis Honors: 21st Century Literature, Secrets & Lies
PREREQUISITE: Graded writing assignment
Using secrets as a guiding theme, examine current works of fiction, poetry, drama, and non-fiction, and develop the skills necessary to be successful in high school and college literature courses. Through reading, analysis, discussion, and writing assignments, discover common themes, reveal historical references and contexts, and discuss 21st century literature as a genre. Peer and instructor feedback are central to this course. The skills developed in this course are great preparation for the critical reading and writing sections of the SAT and the English and Reading sections of the ACT.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

63. Non-Fiction Writing Honors: From Structure to Style
PREREQUISITE: Graded writing assignment
In this intensive writing course, master the fundamentals of several key forms of writing required for success at the high school level. Learn methods of organization and practice myriad academic writing forms, including evaluation of texts and media, research writing, and literature review, all culminating with a rhetorical analysis of your own compositions. Develop a deeper understanding of grammatical structure and writing styles and learn how to express voice within formulaic constructs as you compose essays in response to prompts. This class is great preparation for advanced high school writing and AP® English courses.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

64. Non-Fiction Writing Honors: The Art of the Essay
PREREQUISITE: Graded writing assignment
Exceptional essayists use the written word to present a point of view, prompt a reader to action, or bring an issue to life. In this intensive writing course, learn the fundamentals of effective essay writing and become a better reader and critical thinker in the process. Using a range of essays as models, discuss and practice essay writing, focusing on the persuasive, critical, narrative and personal forms. Learn about audience, purpose, point of view and more. This class is great preparation for advanced high school writing and AP® English courses.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

NEW! 67. Veni, Vidi, Wiki: Contemporary Journalism Honors
See course description in Social Science & Humanities section, page 32.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

Social Science & Humanities

ADMISSION CRITERIA: EXPLORE® R ≥16; SAT Crit. R ≥510; ACT R ≥22; or Admission Portfolio
NOTE: For all Social Science & Humanities courses, residential students are strongly encouraged to bring a small personal printer.
In Persuasion & Debate Honors, examine salient social issues and develop skills in critical thinking, public speaking, argumentation, and writing through lectures and discussions, reflective writing, persuasive essays, speeches, and structured debates. This course focuses on the principles and practices of effective communication in a variety of speaking situations that you may encounter in school and later in life as an adult. After completing this course, you should be prepared for advanced study in honors English, humanities, and the social sciences, and be able to participate in various forms of competitive debate.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

66. Human Rights & Foreign Policy Honors
Since the conclusion of WWII, global relations have been dominated by U.S. foreign policy, leaving the United States both admired and reviled by other nations. This course provides an introduction to foreign policy issues via the study of media, theories and the role of international nation states and actors. Analyze means of international cooperation, such as economic globalization, international legal frameworks, environmental agreements, and diplomacy. Study competing issues of civil conflict, national security, and human rights in the context of contemporary global topics such as the recent migrant crisis in Europe, emerging economies, and climate change. Readings and discussions are complemented by guest presentations, field trips, and structured writing experiences in order to help hone critical-thinking and persuasive-writing abilities.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

NEW! 67. Veni, Vidi, Wiki: Contemporary Journalism Honors
Extra! Extra! Read (Record/Film/Upload/Blog/Comment/Tweet) All About It! Over the last decade rapid technological advancements and the rise of social media have changed how news gets reported and who is doing the reporting, transforming the journalism industry. Examine journalism as a field and discover how digital and social media are changing the conversation. Explore digital media outlets such as blogs, e-zines, audio and video podcasts, and social networks, and become a modern journalist by creating a podcast, YouTube segment, or blog in order to learn about best practices, the ethics of Internet sourcing, and maintaining journalistic excellence.

NOTE: Students are required to bring a laptop computer for use in the course (not a tablet).

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

68. Brain & Behavior: Introduction to Psychology Honors
Why do people do what they do? Why are we the way we are? What makes some behavior “normal” and other behavior “abnormal”? This course focuses on the structures and functions of the brain, neurons, and nervous system; the relationship between brain activity and thought and behavior; 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 in order to gain a better understanding of scientific research and psychological thought. This course is an excellent introduction for students interested in behavioral science or advanced-level psychology courses.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

Business & Entrepreneurship

ADMISSION CRITERIA: EXPLORE® R ≥16; SAT Crt. R ≥510; ACT R ≥22; or Admission Portfolio

69. Bubbles & Crashes: Introduction to Economics Honors
Is Apple® stock overvalued? When will the Dow hit 18,000 again? How do decisions by individuals, corporations, and governments affect markets? Through readings by promi-
dent economists, discussions, and case studies, examine economic booms and crises of the past and present, focusing on concepts such as risk, supply and demand, marginal utility, and the fundamentals of investing. This course develops critical-thinking skills through discussion and writing experiences and is intended for students interested in future coursework in economics, political science, international relations, or other advanced social science courses.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

70. From the Ground Up: Small Business Honors
In this course, work with partners to develop a solid, professional plan for a small business start up. Research the various requirements and costs associated with opening a new business, meet and learn tips of the trade from local entrepreneurs, and gain invaluable experience with business planning and decision making processes. The course concludes with a simulation of operations and reactions to variables, using techniques and tools to track and analyze business performance. Ultimately, your team’s objective is to survive your first year of operation, and, if possible, earn a profit.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

Mathematics

ADMISSION CRITERIA: EXPLORE® M ≥17; SAT M ≥520; ACT M ≥22; or Admission Portfolio

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

71. Algebra I Honors
PREREQUISITE: Pre-Algebra
This course is intended for students who have already studied the introductory ideas of algebra and are ready to extend their knowledge in an intensive, full-year course. Algebra I Honors covers equations and functions, properties of real numbers, solving and graphing linear equations and functions, solving and graphing 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 high school course and is intended for students who are ready to accelerate and plan to enroll in the next course in their district’s mathematics sequence in the fall.

NOTE: This course is cross-listed with Apogee.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

72. 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 high school course intended for students who are ready to accelerate and plan to enroll in the next course in their district’s mathematics sequence in the fall.

NOTE: This course is cross-listed with Equinox.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

Science

ADMISSION CRITERIA: Varies by course; please see individual course descriptions.

74. Fundamental Physics Honors: Force & Motion
PREREQUISITE: Algebra I
Since Newton, force has been one of the most important concepts in physics. Force is fundamental to physics on the small scale (sub-atomic particles), large scale (planets and stars) and everything in between. This course explores a variety of fascinating phenomena in the physical world and the way in which physics explains the motion of large and tiny objects. This includes electrons in an electrical circuit, roller coasters, planets, the light that we see to use, and the sounds we hear. Hands-on lab exercises complement the course material and allow for the derivation of important physics concepts. Fundamental Physics Honors is excellent preparation for more advanced physics coursework such as Physics Honors and AP® Physics.

NOTES:
• A scientific or graphing calculator is required.
• Additional $125 lab fee required.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

ADMISSION CRITERIA: EXPLORE® R ≥14 + EXPLORE® M ≥17; SAT Crit. R ≥440 + SAT M ≥520; ACT R ≥19 + ACT M ≥22; ACT S ≥23; or Admission Portfolio

75. Non-Calculus Based Physics Honors
PREREQUISITE: Algebra I
Build a strong conceptual understanding of physical principles ranging from force and motion to classical mechanics. With this foundation, you will be equipped to understand the equations and formulas of physics and to make connections between concepts and their everyday world. This course is a full-year physics curriculum 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: Force & Motion. Non-Calculus Based Physics Honors prepares students for more advanced physics topics and AP® Physics.

NOTES:
• A scientific or graphing calculator is required.
• Additional $125 lab fee required.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

ADMISSION CRITERIA: EXPLORE® R ≥16 + EXPLORE® M ≥17; SAT Crit. R ≥510 + SAT M ≥520; ACT R ≥22 + ACT M ≥22; ACT S ≥23; or Admission Portfolio

“Not only was my instructor an expert, he was funny, friendly, and had very high expectations.”

—2015 Spectrum student
76. Topics in Chemistry Honors
PREREQUISITE: Algebra I

Do you know the common name for acetylsalicylic acid? Hint: it can relieve a headache and reduce the risk of heart attack and stroke. In this course, expand your understanding of the chemistry in everyday surroundings. Through laboratory experiments, learn the fundamentals of chemistry, including atomic theory, stoichiometry, chemical reactions, intermolecular forces, periodic trends, and acids and bases, and develop proper lab technique. Explore concepts, adjust variables independently and use your findings to determine next steps. This inquiry-based course provides a foundation for advanced studies in chemistry.

NOTES:
• A scientific calculator is required.
• Additional $125 lab fee required.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester
ADMISSION CRITERIA: EXPLORE® R ≥14 + EXPLORE® M ≥17; SAT Crit. R ≥440 + SAT M ≥520; ACT R ≥19 + ACT M ≥22; ACT S ≥23; or Admission Portfolio

77. Chemistry of Color Honors: From Picasso to Fireworks
PREREQUISITE: Algebra I

Like Topics in Chemistry, this course covers chemistry fundamentals, but through the theme of color. Learn about atomic structure, chemical bonding, chemical reactions, solutions, structures of molecules and solids and organic functional groups by exploring the chemistry that generates color in objects such as neon lights, fireworks, and natural and synthetic pigments. Through experiments and other hands-on activities, discover the connections between chemistry and other fields including art, physics, life sciences, and earth science. An interest in art is helpful, but not required. This course provides students with an introduction to chemistry lab procedures and lab reports and is excellent preparation for Honors Chemistry.

NOTES:
• A scientific calculator is required.
• Additional $125 lab fee required.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester
ADMISSION CRITERIA: EXPLORE® R ≥14 + EXPLORE® M ≥17; SAT Crit. R ≥440 + SAT M ≥520; ACT R ≥19 + ACT M ≥22; ACT S ≥23; or Admission Portfolio

78. Introduction to Biomedicine Honors

For millions of years, the human body has been evolving, yet it still presents challenges and mysteries. In this course, explore the connections between groundbreaking medical research that has revealed insights into the body’s molecular and cellular processes and 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 areas of biology such as cell biology. This course is an excellent introduction to the study of medicine or advanced laboratory courses.

NOTES:
• Additional $125 lab fee required.
• This course will use classroom and lab space at Roycemore School. Residential students will live on campus and take a brief bus ride daily to class.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 1 semester
ADMISSION CRITERIA: EXPLORE® R ≥16; SAT Crit. R ≥510; ACT R ≥22; ACT S ≥23; or Admission Portfolio

79. Topics in Biology Honors

Biology is the study of living organisms, progressing from the molecular level to cellular on through organism and ecosystem continuing up to the entire biosphere. In this course, practice lab design and presentations and conduct problem-based and project-based experiments. Among the topics explored are experimental method, biochemistry, cell structure, cellular reproduction, evolution, and ecology. This course is recommended for students with some knowledge of laboratory techniques or those who have not had a full year of high school level laboratory science. Topics in Biology prepares students for high school honors biology.

NOTES:
• Additional $125 lab fee required.
• This course will use classroom and lab space at Roycemore School. Residential students will live on campus and take a brief bus ride daily to class.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters
ADMISSION CRITERIA: EXPLORE® R ≥16; SAT Crit. R ≥510; ACT R ≥22; ACT S ≥23; or Admission Portfolio
NEW! 83. C++ Programming Honors
PREREQUISITE: Algebra I & demonstrated experience in one programming language required
In C++, you will learn to write your own code from scratch. Key concepts will 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++, engage in discussion of the ethical and social implications of programming, spanning 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.
• Eligible for Sandra Dennhardt Technology Scholarship; see the Summer Program website for more information.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

85. 3D Printing & Product Design with the Segal Design Institute
Design and prototype a product of your own creation in this hands-on design studio course offered in partnership with the Segal Design Institute at Northwestern University. This course will explore and evaluate Northwestern University’s own rapid prototyping services in the context of the human-centered design process. Learn the fundamentals of 3D design through physical and digital modeling, prototyping, and discussion. Use 3D printing to evaluate design ideas, provide user testing, and get feedback as well as test product readiness for distribution through Shapeways, an online 3D printing marketplace.

NOTES:
• Additional $150 materials fee required.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

86. Visual Communication Honors: Graphic Design
Explore the fundamental elements of visual communication from typography to branding to product 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. Complementing the technical portion of the course, experience daily sketchbook activities and readings on design history, contemporary design, and global brand awareness. Field trips, films, and readings will help you explore the challenges faced by 21st century designers.

NOTES:
• Additional $125 lab fee required.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

88. Robotics Honors: VEX® Robotics
PREREQUISITE: Algebra I
VEX EDR® is a robotics system consisting of modular hardware, sensors, and programming software, which are combined to create custom machines able to execute tasks. While utilizing all facets of STEM curriculum, work in teams of three to analytically, strategically, and cooperatively design, engineer, build, program, test, and operate a competition robot. Take on complicated robotics challenges and square off against your classmates in a battle of creativity, design, and execution using Cortex Microcontrollers, a VEXnet® Joystick and the VEXnet® Wireless link. 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, building and collaborative skills crucial in emerging design and engineering careers.

NOTE: Additional $150 materials fee required.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 1 semester
Equinox Program

Grades 9–12
(grade level on January 1, 2016)

Equinox creates a rigorous, fast-paced learning community for academically advanced students in grades 9 through 12. Equinox courses provide students the opportunity to earn high school credit for advanced high school and college-level subjects through the Center for Talent Development. 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, but there are also several five-week course options. To comply with College Board standards, AP® Chemistry is offered as a five-week course. This allows for the completion of all required lab experiences and good AP® exam preparation. Other specialized courses that require more in-depth study and utilize the five-week format include Mini MBA, Summer Writers’ Workshop, and Build Your Own Computer. See course descriptions for more information.

Advanced Placement (AP®) courses: The College Board requires course review and approval for all institutions offering AP® courses. Because the approval timeline is later than our publication deadline, not all courses have completed the approval process by the time this brochure is printed. We will update AP® approvals on the Center for Talent Development website in late 2016 at www.ctd.northwestern.edu/summer.

Apply early! Application period begins January 4, 2016.
Northwestern University, Evanston IL
(residential or commuter)

### 3-Week Session 1: June 26 – July 15

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### 3-Week Civic Leadership Institute: July 10 – 29

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"[The instructor] makes an insanely hard class seem very manageable, and she creates a supportive environment which really allows you to flourish."

—2015 Equinox student
Equinox Course Descriptions

English & Language Arts

ADMISSION CRITERIA: SAT Crit. R ≥510; ACT R ≥22; or Admission Portfolio

NOTE: For the following courses, residential students are urged to bring a small printer.

88. College Composition & Rhetoric
PREREQUISITE: Graded writing assignment; one year of high school honors English

In this intensive, process-driven course, learn to write persuasively for a range of purposes. Covering personal narrative, expository, persuasion, and other modes, read and analyze a variety of complex texts and synthesize information to create cogent arguments. Working closely with peers and the instructor, complete the course with a portfolio of essays worthy of any college classroom.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

89. Creative Writing Seminar
PREREQUISITE: Graded writing sample, preferably creative writing

This course refines critical reading and creative writing skills through analysis and discussion of contemporary literature and extensive creative writing, with a focus on revision. Develop skill with sentence and narrative structure, imagery, selection of detail, voice, and dialogue across genres, including poetry, fiction, and creative nonfiction. Receive feedback on your work in a workshop format and submit a final portfolio of original work.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

NEW! 90. STEAM Engine Honors:
Communicating Fearlessly
PREREQUISITE: Graded writing sample

How do you convince a corporate investor to fund your research or the FDA to approve your lab’s new medication? The proverbial bridge between investor and engineer is built with sound communication. In this new performance-based workshop, future STEAM leaders learn to arouse popular interest in specialized subjects with skills borrowed from theater, visual communication, marketing, journalism and rhetoric. Students polish a ten-minute presentation as their capstone project.

This course is based on the Northwestern Ready, Set, Go program, which equips graduate student researchers with the interpersonal communication and presentation skills they need to successfully present their work.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

NEW! 91. Digital Journalism Honors:
Storytelling for a Mobile Audience
PREREQUISITE: Graded writing sample

In a conversation with John McDermott of Digiday, Stephen Dubner opined, “The podcast is only possible because of the digital revolution. Apple and a few others built this free distribution architecture that allows me to publish anything I want to virtually anyone in the world who has any kind of device.” The best podcasts offer mobile content in the shape of great stories. In this new project-based course, examine the art of compelling storytelling, practice journalism methodology, and learn the production techniques essential to creating an original podcast.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

NEW! 114. Summer Writers’ Workshop

NOTE: This course runs for five weeks. Attendance for all five weeks is required.
PREREQUISITES: Graded creative writing sample; one year of high school honors English; previous writing workshop experience preferred

Designed for students with some experience and considerable interest in creative writing, this course pairs adventurous reading with rigorous writing across genres, including poetry, fiction, and creative nonfiction. Assignments advance skills with imagery, voice, setting, character, and narrative. The extended workshop format reinforces the virtues of daily writing, revision, and peer review, and allows focus on a genre of choice at the midpoint of the course. Through the Summer Writers’ Workshop, you will develop a portfolio of serious original work ready for publication.

OFFERED: This course runs for five weeks, from June 26 through July 29.
HIGH SCHOOL CREDIT OFFERED: 2 semesters

Social Sciences & Humanities

ADMISSION CRITERIA: SAT Crit. R ≥510; ACT R ≥22, or Admission Portfolio

NOTE: For the following courses, residential students are urged to bring a small printer.

NEW! 92. 21st Century Identities & the Construction of Self
PREREQUISITE: Graded writing assignment

In the last century, the idea of the self as a social construct has emerged as a part of the human rights conversation. In this interdisciplinary seminar, learn to talk, think, read, and write about privilege, race, age, nationality, and other constructs that inform how the self is understood. Survey the various civil rights movements of the last century and research a problem that you identify and explore, creating a college level capstone paper.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

93. Critical Discourse Honors: Tackling Big Questions with Confidence

PREREQUISITE: Graded writing assignment

In a time when many important topics are obscured by emotional and reductive thinking, this course digs beneath the surface. Critical Discourse is a college-level survey of the most prominent ethical theories (e.g. consequentialism, Kantianism, moral relativism), which lend depth and scope to contemporary issues such as social welfare, gender and sexuality, and stem-cell research. In this course, learn to analyze and evaluate arguments, to discipline persuasion with logic, and to think critically about the most salient topics of our day.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

94. United States Law & Politics Honors:
Election Year Edition

PREREQUISITE: Graded writing assignment

Our politicians and government officials are celebrities; their lives and actions make headlines, and their decisions have signifi-
cant impact. In the summer before the 2016 presidential election, use the media narrative of campaigns to examine the history and significance of the U.S. Constitution, the Supreme Court, and federal structure, and gain an appreciation for the interplay of law and politics in American society. Conduct an in-depth analysis of several Amendments to the Constitution and use the Bill of Rights to consider current events.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

95. International Relations Honors & The Challenge of Global Citizenship
PREREQUISITE: Graded writing assignment
In the Pulitzer Prize winning novel by Phillip Roth, American Pastoral, Nathan Zuckerman famously asks, “And what are we to do about this terribly important business of other people?” This question rings especially true now as the international community is called upon to help resettle record numbers of refugees. In this timely iteration of a returning favorite, examine migration theory and the complex forces that drive human movement and shape global politics over time. Analyze past and current conflicts as you assess individual, national, and international responses to global events.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

96. Global Economy Honors
PREREQUISITE: Graded writing assignment
Learn the basic principles of economics by examining the economic issues of our time, exploring the forces that lead to globalization, and analyzing events from the standpoint of multiple stakeholders. Topics such as informal economies, the role of human rights, non-governmental organizations, sustainability, and trade policies are addressed through case studies, discussions, research, and critiques. This interdisciplinary course draws from international studies and economics scholarship, providing preparation for college-level courses in economics and global studies.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

97. Economics of Everything Honors
PREREQUISITE: Graded writing assignment
If, as Freakonomics authors Levitt and Dubner have proposed, economics is the study of human behavior, then is your life governed by the economic choices you make? Economics of Everything introduces economic theory, including incentives, supply and demand, competition, markets and prices, game theory, and the role of government in economic systems. Apply your knowledge to contemporary case studies, reading, analyzing, and discussing authors such as Levitt, Dubner, Schelling, Becker, Ehrenreich and others.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester

Business & Entrepreneurship

ADMISSION CRITERIA: SAT Crit. R ≥510; ACT R ≥22 or Admission Portfolio

RETURNING FAVORITE! 98. Data Science Honors: The Metrics of Change
PREREQUISITE: Algebra I
Nate Silver of ESPN’s FiveThirtyEight uses big data to analyze everything from politics to sports, modeling predictions news analysts and regular folk can use daily. This course explores the newly articulated world of data science in its full range of applications and expressions. Surveying theories of probability, learn how to turn data into algorithms for making better decisions. Through case studies and individual research, identify, collect, and interpret data using computer programming toward proposals for action.

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

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 1 semester

UPDATE FAVORITE! 117. Mini MBA
NOTE: This course runs for five weeks. Attendance at all five weeks is required.
PREREQUISITES: Algebra I & II
What does it take to manage a business successfully? Quite a lot, it turns out. In this course, survey the fundamentals of business such as strategic planning for growth, organizational design, and marketing. Study analytic tools for decision-making and frameworks to communicate effectively and implement strong decisions. Finally, learn the presentation and research skills needed to pitch your business plan to stakeholders in a “shark-tank” feedback environment. hone your collaborative and leadership skills to think strategically and cross-functionally and to integrate ambiguity and uncertainty into your project management.

OFFERED: This course runs for five weeks, from June 26 through July 29.
HIGH SCHOOL CREDIT OFFERED: 2 semesters

Leadership & Service

119. Service, Leadership & Community Transformation
Students interested in service and social issues should consider the Civic Leadership Institute. For admission criteria and details, see page 43.

Mathematics

ADMISSION CRITERIA: SAT M ≥520; ACT M ≥22; or Admission Portfolio
NOTE: For the following courses, a graphing calculator is required in addition to a laptop computer or tablet.

99. AP® Statistics (designation pending)
PREREQUISITES: Algebra I & II
Collecting, analyzing, and drawing conclusions from data are skills required in virtually every discipline. It also lays the foundation for advanced studies in big data and data analytics. In this non-calculus-based course, explore the theory 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. Upon completion, you are prepared to take the AP® Statistics exam.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters
100. 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 high school course intended for students who are ready to accelerate and plan to enroll in the next course in their district's mathematics sequence in the fall.

NOTE: This course is cross-listed with Spectrum.
OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

101. Pre-Calculus Honors
PREREQUISITES: Geometry, 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.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

102. AP® Calculus AB (designation pending)
PREREQUISITES: Geometry, Algebra I & II with Trigonometry; Pre-Calculus
Rocket scientist or brain surgeon, architect or engineer, the study of calculus is the foundation for many professional endeavors. This college-level calculus 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. Upon successful completion, students are prepared to take the AP® Calculus AB exam.

OFFERED: Session 1
HIGH SCHOOL CREDIT OFFERED: 2 semesters

103. AP® Calculus BC (designation pending)
PREREQUISITE: Geometry, Algebra I & II with Trigonometry; Pre-Calculus; AP® Calculus AB
Continue work begun in AP® Calculus AB. Analyze functions and planar curves graphically, numerically, and verbally. Through collaborative inquiry and direct instruction, further develop your abilities with differentiation and applications of derivatives, differential equations and techniques of anti-differentiation such as integration by parts, partial fractions and improper integrals. Also included are numerical and polynomial approximations and series. This is the two-semester capstone of advanced high school mathematics and readies students for advanced calculus at the university level. Upon successful completion, you are prepared to take the AP® Calculus BC exam.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

Science

ADMISSION CRITERIA: Score requirements vary by course. See descriptions for details.

104. Physics Honors
PREREQUISITES: Algebra I & II with Trigonometry; 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.

NOTES:
• A graphing calculator is required.
• Additional $150 lab fee required.
OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

105. Astrophysics
PREREQUISITES: Algebra II & Trigonometry; Physics Honors
Astrophysics seeks the origin and evolution of planets, stars, galaxies, and the elements themselves. Explore laws and theories such as Newton’s law of universal gravitation, Kepler’s law of planetary motion, and Einstein’s theory of relativity. Principles of physics, mathematics, and astronomy are used to study the evolution and death of stars, the formation of planetary systems, and current theories of astrophysics.

NOTES:
• A graphing calculator is required.
• Additional $150 lab fee required.
OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

106. Waves, Fields & Particles
PREREQUISITES: Algebra II & Trigonometry; Physics Honors
Relativity and Quantum Mechanics challenge our intuitions and experience in stunning, even baffling ways. Students investigate the evidence challenging classical models and build an understanding of the models of relativity and quantum mechanics. A glimpse of Quantum Field Theory, the Standard Model, Quantum Gravity and String Theory round out this course.

NOTES:
• A graphing calculator is required.
• Additional $150 lab fee required.
OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester
ADMISSION CRITERIA: SAT Crit. R ≥510 + SAT M ≥520; ACT R ≥22 + ACT M ≥22; ACT S ≥23; or Admission Portfolio

107. Chemistry Honors
PREREQUISITES: Biology Honors OR Physics Honors; Algebra I
How does an atom account for the nature of matter? In this course, study the modern principles 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 and produce scientific lab reports. Chemistry Honors is a full-year course in an accelerated format.

NOTES:
• A graphing calculator is required.
• Additional $150 lab fee required.
OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters
ADMISSION CRITERIA: SAT Crit. R ≥510 + SAT M ≥520; ACT R ≥22 + ACT M ≥22; ACT S ≥23; or Admission Portfolio

115. AP® Chemistry (designation pending)
NOTE: This course runs for five weeks, and attendance for all weeks is required.
PREREQUISITE: Chemistry Honors; 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 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.
NoTEnotes:
• A graphing calculator is required.
• Additional $150 lab fee required.
offereD: This course runs for five weeks, from June 26 through July 29.
HIGH SCHOOL CREDIT OFFERED: 2 semesters
ADMISSION CRITERIA: SAT Crit. R ≥510; ACT R ≥22; ACT M ≥22; ACT S ≥23; or Admission Portfolio

108. Biology Honors
PREREQUISITE: One year of lab science
Biology comes alive in this fast-paced high school honors course, emphasizing the principles that apply to plants and animals. As a supplement to class discussion, text readings, and demonstrations, spend class time in a laboratory, performing experiments and learning methods of scientific investigation. Biology Honors is a full-year course in an accelerated format and is designed for students who intend to accelerate in science in general and advanced studies in biology in particular. Students will be ready for Neuroscience, Human Biology, and AP® Biology.

NOTEnotes:
• Additional $150 lab fee required.
• This course will use classroom and lab space at Roycemore School. Residential students will live on campus and take a brief bus ride daily to class.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters
ADMISSION CRITERIA: SAT Crit. R ≥510; ACT R ≥22; ACT M ≥22; ACT S ≥23; or Admission Portfolio

109. Human Biology: Anatomy & Physiology Honors
PREREQUISITE: Biology Honors
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 chemical composition of cells.

NOTEnotes:
• Additional $150 lab fee required.
• This course will use classroom and lab space at Roycemore School. Residential students will live on campus and take a brief bus ride daily to class.

OFFERED: Session 2
HIGH SCHOOL CREDIT OFFERED: 1 semester
ADMISSION CRITERIA: SAT Crit. R ≥510; ACT R ≥22; ACT M ≥22; ACT S ≥23; or Admission Portfolio

UPDAtEDe FAVORiTe! 116. Biotech Honors: From Microbes to Genomes
Note: This course runs for five weeks, and attendance for all weeks is required.
PREREQUISITE: Two years of lab science; Biology Honors and Chemistry Honors preferred
Using your genetic information and current biotechnology techniques, scientists can identify and potentially eliminate genetic diseases, design personalized medicines, and even engineer microorganisms to do their bidding. This course explores the current experimental techniques and applications that scientists use in biotechnology. Learn college-level concepts in genetics, molecular biology, biochemistry, microbiology, and genetic engineering as you practice laboratory techniques utilized in both research and industrial settings, including gene cloning, DNA and protein electrophoresis, chromatography, protein purification, enzyme and immunology assays, and bacterial cell culture. Through case studies and individual research, discuss the potentially contentious ethi-
Computer Science & Technology

ADMISSION CRITERIA: SAT M ≥520; ACT M ≥22; or Admission Portfolio

111. AP® Computer Science A (designation pending)

PREREQUISITES: Algebra I & II; demonstrated experience in one programming language

Java is used in industries ranging from retail to finance to 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. Prior experience with Java is not required, but you must have previous programming or computer language experience. This course prepares students for the AP® Computer Science exam.

NOTES:
• A laptop computer (not a tablet) is required for this course.
• Eligible for Sandra Dennhardt Technology Scholarship; see the Summer Program webpage for more information.

OFFERED: Sessions 1 & 2
HIGH SCHOOL CREDIT OFFERED: 2 semesters

112. Microcontrollers in Robotics & the Internet of Things with Windy City Lab

PREREQUISITE: Algebra II; demonstrated programming experience

In this exciting Internet of Things course, learn about the fundamentals of digital electronics, an array of sensors, motors, wireless technologies, display technologies, and the fundamentals of the ARM Cortex-M family of microcontrollers. Program the firmware to build Internet of Things (IoT) devices and an autonomous robot. All programming will be done in C, a dominant language of the robotics and the iOS application development industry. Windy City Lab creates a development shop experience for students interested in stretching their programming and robotics knowledge into new realms.

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 at the new Catalyze Chicago. Windy City Lab believes there is no substitute for learning-by-doing, asking questions, and getting your hands on a soldering iron.

NOTES:
• A laptop computer (not a tablet) is required for this course.
• Partnership course tuition rate. See the Tuition & Fees webpage for details.

OFFERED: This course runs for five weeks, from June 26 through July 29.
HIGH SCHOOL CREDIT OFFERED: 2 semesters

118. Build Your Own Computer & PC Pro Certificate Program

NOTE: This course runs for five weeks, and attendance for all weeks is required.

PREREQUISITES: Algebra I

This course lays the foundation for future endeavors in information technology. Learn the hardware assembly and system diagnostics needed to create a machine with individualized functionality. To prepare for PC Pro certification, learn to troubleshoot problems in a collaborative environment. Learn to build, configure, maintain, and repair a PC as well as the basics of networking and security. Using video tutorials, demonstrations, and hands-on lab simulations, you will not only be able to prove that you know the material, you will also be able to demonstrate you can perform the IT tasks employers are looking for.

NOTES:
• Five-week course tuition rate. See the Tuition & Fees webpage for details.
• This course is cross-listed with Spectrum.

OFFERED: This course runs for five weeks, from June 26 through July 29.
HIGH SCHOOL CREDIT OFFERED: 2 semesters

Design & Engineering

ADMISSION CRITERIA: SAT M ≥520 + SAT S ≥22; ACT R ≥22 + ACT M ≥22; ACT S ≥23; or Admission Portfolio

NEW! 118. Build Your Own Computer & PC Pro Certificate Program

NOTE: This course runs for five weeks, and attendance for all weeks is required.

PREREQUISITES: Algebra I

This course lays the foundation for future endeavors in information technology. Learn the hardware assembly and system diagnostics needed to create a machine with individualized functionality. To prepare for PC Pro certification, learn to troubleshoot problems in a collaborative environment. Learn to build, configure, maintain, and repair a PC as well as the basics of networking and security. Using video tutorials, demonstrations, and hands-on lab simulations, you will not only be able to prove that you know the material, you will also be able to demonstrate you can perform the IT tasks employers are looking for.

NOTES:
• Five-week course tuition rate. See the Tuition & Fees webpage for details.
• This course is cross-listed with Spectrum.

OFFERED: This course runs for five weeks, from June 26 through July 29.
HIGH SCHOOL CREDIT OFFERED: 2 semesters
Civic Leadership Institute
Grades 9-12
(grade on January 1, 2016)
Northwestern University’s Civic Leadership Institute (CLI) combines hands-on education, meaningful service, powerful speakers and seminars, and an unforgettable residential experience for a summer that students describe as life-changing.

CLI students explore the complex challenges that affect our communities and develop the knowledge, experience, and leadership skills they need to make a positive impact on the world.

Experience Chicago
CLI participants live and learn in the heart of downtown Chicago. This ideal central location offers unparalleled access to Chicago’s Loop and historic neighborhoods throughout the city. Service experiences immerse students in vibrant communities like Bronzeville, Chinatown, and Pilsen, while recreational activities allow students to explore cultural sites and tourist attractions like Navy Pier, Millennium Park, and the Magnificent Mile. Living downtown provides students with an exceptional opportunity to experience all that this incredible city has to offer!

Change the world. Start here.
• Learn about social issues
• Develop leadership skills
• Serve communities
• Make a difference

119. Service, Leadership & Community Transformation
Young people often receive the message that they can’t make a difference. That they don’t have the knowledge, skills, or motivation to influence issues like poverty, healthcare, education, or the environment. That they’re powerless to create change.

Yet there are countless stories that prove this is not the case. Four college students started a sit-in that fueled the civil rights movement, and thousands of young people powered the peaceful protests that ended legal segregation. One 13-year-old, with a group of 7th grade classmates, founded a youth-led organization that has fought against child labor and built schools and health clinics in villages around the world. Those are just a few examples.

What power, passion, and resources do you possess? At the Civic Leadership Institute (CLI), you’ll begin your discovery.

“An amazing and eye-opening experience that makes me want to take action in my community!”
—2015 Civic Leadership Institute student

NOTES:
• Service Learning Credit Offered: 25 to 100 hours
• Residential students only
• Specialized tuition rate. See the Tuition & Fees webpage for details.

ADMISSION CRITERIA: Above-grade-level SAT or ACT test; OR ≥90th percentile rank in verbal or reading on standardized achievement test OR an Admission Portfolio

For More Information
Civic Education Project
Phone: 847/467-2572
E-mail: cep@northwestern.edu
Web: cep.northwestern.edu

For students completing grades 7 or 8 interested in service and leadership, consider:
59. Taking Action: Leadership & Service
Please see detailed course description on page 30.
General Program Information

Application Process
The online application is available at my.ctd.northwestern.edu.

Complete applications (including all supporting documents) are reviewed as they are received starting January 4, 2016. Courses are filled on a first-come, first-served basis.

The application period will close on June 10, 2016, which is also the withdrawal deadline for full fee refunds (less a $60 processing fee).

Although CTD tries to accommodate late applications, enrollment may not be possible.

Please be sure to complete the application online, including all supporting materials, as applications are reviewed only after all supporting documents and information has been received. Incomplete applications are not reviewed nor do they “hold a spot” in the desired course, regardless of whether or not payment is included.

Once the Summer Program receives a completed application, it is forwarded to the appropriate program coordinator for review. Once an enrollment decision is made, the program coordinator will notify the applicant via e-mail using the primary e-mail address provided in the application. Application decisions will also be posted in students’ MyCTD account. The process takes approximately four weeks from the time a completed application is received. Due to the volume of applications, the review process may take longer in April, May, and June.

Program Tuition & Fees
Tuition rates vary by program, program length, course requirements, and application date. Basic tuition information at the application rate through May 15, 2016 is provided below. Detailed information about tuition, payments, and refund and withdrawal policies is on the CTD website at www.ctd.northwestern.edu/tuition-fees.

Leapfrog & Spark
Tuition ranges from $265 for a half-day, four-day Leapfrog program to $650 for an all-day, weeklong Leapfrog or Spark program. Challenge Lab tuition is $60 for a single, three-hour session.

Solstice
Tuition ranges from $1,535 (commuter, per session) to $2,645 (residential, per session).

Apogee
Tuition ranges from $2,125 (commuter, per session) to $3,715 (residential, per session).

Spectrum, Equinox & Civic Leadership Institute
Tuition ranges from $2,125 (commuter, per 3-week session) to $5,315 (residential, per 5-week session).

PLEASE NOTE:
• Some courses require specialized equipment and/or a lab or materials fee. See individual course descriptions for details.
• Residential fees cover tuition, room and board, books, basic materials and activities, and health center fees.
• Commuter fees include tuition, books, basic course materials, lunch (for Solstice, Apogee, Spectrum & Equinox commuters only), and activities (optional, after class).
• Spectrum and Equinox students are required to bring a laptop computer or tablet for use in class, because many instructors make use of technology for teaching. Some specialized courses (Solstice through Equinox) require a laptop computer; please see course descriptions for details.

Financial Aid & Payment Plan
Need based financial aid is available for Summer Program courses. Early application is encouraged for families requesting financial aid, as funds are limited and granted on a rolling basis. The financial aid application deadline is April 15, 2016.

A $60 deposit is required to complete the online application. The deposit will be refunded if the student is not admitted or if the aid award offered is not sufficient to meet the family’s financial need.

A five-month payment plan is available. To apply, you must submit the payment plan application form available on our website.

Students enrolling in select technology courses may be eligible for the Sandra Dennhardt or Gary Greenberg Technology Scholarships. Details on eligibility and application process are on the website under Enrollment, Scholarship Opportunities.

Contacting the Summer Program & Future Communication from CTD
Phone: 847/491-8257 (Summer Program direct line)
E-mail: summer@ctd.northwestern.edu
Fax: 847/467-0880

Program participants will receive notifications of other programs and services provided by CTD. We hope you enjoy hearing about other opportunities. If you do not wish to receive e-mail messages promoting programs or services from CTD, contact us at 847/491-3782 ext. 4 to request that your name be removed from our e-mail lists.
Center for Talent Development, Northwestern University

Dynamic Pathways for Gifted Learners

Center for Talent Development (CTD) at Northwestern University is dedicated to helping gifted students, age 4 through grade 12, reach full potential. We provide research-based assessment, advanced programs, and resources to enhance a child’s schooling. Our signature approach to talent development delivers personalized options and guidance for young people with high ability. Program pathways lead students on a journey of intellectual, emotional and social growth. By extending support to families and educators, we help exceptional students discover their unique voice, explore opportunities, cultivate a love of learning, and become bold, creative achievers and contributors.

Special Event for Families: Opportunities for the Future Family Conference

CTD hosts a family conference just prior to the start of the Summer Program. It offers parents the chance to learn from experts in gifted education about talent development, social and emotional issues, and educational options. Students in grades 4 through 12 attend workshops on their favorite subjects and explore career paths.

Date, Time & Location: Saturday, June 25 from 1 to 5 p.m. on Northwestern University’s Evanston campus.

All details, including speakers, workshop sessions, and fees will be posted on the CTD website in January: www.ctd.northwestern.edu

Northwestern University’s Midwest Academic Talent Search (NUMATS)

The foundation for a lifelong journey of achievement and fulfillment. Research-based assessments identify exceptional academic ability and connect students to tailored programs and opportunities. Parents and educators gain invaluable information to create challenging, dynamic pathways that nurture individual potential.

Gifted LearningLinks

Individualized pathways through online learning that expand access to advanced subject matter and foster personal interests. Motivated students progress at the time, place, and pace right for them and enjoy one-on-one engagement with instructors.

Weekend Enrichment Programs

Weekend opportunities for discovery that allow gifted students to focus their curiosity and passion on a specific interest area. A wide variety of advanced and unique courses range in duration from a single weekend to eight consecutive Saturdays.

Civic Education Project

Pathway to leadership and civic engagement that combines service-learning with academic study and reflection. Bright, impassioned students engage in social issues first-hand and develop skills to change the world.

National Association For Gifted Children

The National Association for Gifted Children (NAGC) is an organization of parents, teachers, administrators, other professionals and community leaders addressing the unique needs of children and youth with demonstrated gifts and talents as well as those children who may be able to develop their talent potential with appropriate educational experiences. Visit the NAGC website to join this organization and add your name to the ranks of supporters working to raise awareness of the needs of gifted learners nationwide. Learn more at www.nagc.org.

Students associated with Center for Talent Development are held to all responsibilities of members of the Northwestern University community. Northwestern University and Center for Talent Development reserve the right to change without notice any statement in this brochure concerning, but not limited to, rules, policies, tuition, fees, courses, and faculty.

Northwestern University does not discriminate or permit discrimination by any member of its community against any individual on the basis of race, color, religion, national origin, sex, pregnancy, sexual orientation, gender identity, gender expression, parental status, marital status, age, disability, citizenship status, veteran status, genetic information, or any other characteristic protected by law in matters of admissions, employment, housing, or services or in the educational programs or activities it operates. Harassment, whether verbal, physical, or visual, that is based on any of these characteristics is a form of discrimination.

For advice or assistance regarding this policy, contact the Office of Equal Opportunity and Access, 720 University Place, Evanston, Illinois 60208-1145. Phone: 847/491-7458.
Northwestern Center for Talent Development
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2016 Summer Program
For academically gifted students age 4–grade 12