Winter 2023 Weekend Programs Course Catalog

PreK - Grade 8

Northwestern University's Center for Talent Development (CTD) has an array of high-quality, captivating online and in-person enrichment courses available for students on Saturdays. Our courses focus on high-interest topics, include both collaborative group work and individual hands-on projects, and are led by expert instructors who demonstrate the joy in learning. Courses in English & Language arts, mathematics, science, design & engineering, and computer science & technology engage students during six Saturdays. Students with demonstrated strengths in verbal/reading and/or math, depending on course, may apply. See https://www.ctd.northwestern.edu/eligibility for eligibility details. Visit our <u>application page</u> to begin your application.

Weekend Enrichment Program Details Dates: Saturdays, January 21, 28, February 4, 11, and 25, 2023 (If needed, inclement weather day: March 4) Times: 9:00 a.m. - 11:30 a.m.; select afternoon courses also in Evanston (12:00 p.m. - 2:30 p.m.) Central Time Locations: Evanston and Chicago - view the Weekend Enrichment Program web page for details. Tuition: \$365

PreK - Kindergarten

Math is a Blast: Problem Solving Through Play

Offered: Evanston (AM and PM) and Chicago

How is math used in the world around us? Through interactive games, secret codes, graphing activities, and hands-on collaborative projects, be propelled into the wondrous world of mathematics. Challenge yourself and others by creating your own games, puzzles, codes and stories about mathematical principles such as proportion, area, patterns, perimeter, and fractions. *Open Enrollment: no eligibility requirements SUBJECT: Math*

Astronomical Adventures

Offered: Evanston (AM, only) and Chicago

How can learning about our solar system teach us about our own planet, Earth? Young astronomers learn about the objects in our solar system and how they impact each other. Discover how the Earth's orbit gives us day and night and our seasons, how the moon appears to us on the planet's surface, and more. Through hands-on projects, dramatic play, research and literature, and demonstrations, students explore planets, moon phases, eclipses, comets, asteroids, and more. *Open Enrollment: no eligibility requirements SUBJECT: Science*

Kindergarten - Grade 1

Robots and Roadways

Offered: Evanston, only (AM and PM)

How do we tell robots what to do? Using age-appropriate technology tools such as BeeBots, learn how to tell robots where to go and what to do when they don't listen. Write your own programs and represent that code in a variety of ways using words and symbols. Through hands-on activities, role play, and acquisition of basic programming vocabulary, students build an early foundation for future computer science experiences.

Open Enrollment: no eligibility requirements SUBJECT: Technology and Engineering

Tangible Coding: Coding With Your Hands

Offered: Chicago, only

How do you control a robot without written code? Students develop coding and spatial reasoning skills while using colorful, interactive block commands and hands-on tools. Gain practice with testing and debugging original programs while engaging with various robots like Primo Cubetto or Botley. Fundamental computer science concepts such as symbols and algorithms are explored through dramatic play, construction, engineering, and storytelling. *Open Enrollment: no eligibility requirements*

SUBJECT: Technology and Engineering

Grades 1 – 2

Physics and Engineering: Planes, Trains and Automobiles

Offered: Evanston (AM and PM) and Chicago

How do the laws of physics affect vehicles? Learn how planes, trains and cars are built and examine how they move about our world. This hands-on science course explores introductory principles of physics and their impact on the vehicles humans build and use. Compare and analyze results from tests on various wheeled vehicles. Create vehicles and modify them to test different design strategies.

Open Enrollment: no eligibility requirements SUBJECT: Science

Solution Sleuths: Experts in Problem Solving

Offered: Evanston (AM, only) and Chicago

A fire engine travels five miles to a fire at a speed of 60mph. Its tank holds 500 gallons of water, but it's been leaking throughout the journey at a rate of 5 gallons per minute. How much water is left in the tank when it arrives at the fire? By learning and applying strategies, students grapple with mind bogglers and brainteasers to determine the best solutions to real-life problems. Mathematical dexterity is enhanced as young learners think about, solve, and create their own complex and interesting problems utilizing operations such as multiplication and division.

Open Enrollment: no eligibility requirements SUBJECT: Math

Grades 3 – 4

Python Programming

Offered: Evanston, only (AM and PM)

How can we design Python code that it easy to read and write? Python is a powerful, flexible, yet simple object-oriented programming language with applications across fields from gaming to Google. In a collaborative, workshop setting, develop essential text-based coding skills. Projects may include making original music, developing original images and patterns, and creating simple computer games.

Qualifying Area: Reading OR Math SUBJECT: Technology

Topics in Pre-Algebra

Offered: Evanston (AM and PM) and Chicago

In this introductory level course, students gain experience with topics that may include estimation, applying operands, performing operations with fractions, decimals and percentages, and using variables and expression. Through exploration, practice and application, students develop skills to deepen their understanding of mathematical ideas. *Qualifying Area: Math SUBJECT: Math*

The Science and History of Spy Work

Offered: Evanston (AM, only) and Chicago

Students receive top secret briefings and complete missions using history, science, and technology. Through hands-on individual and small-group activities, students explore the art and skill behind encryption, cryptography, surveillance, and how to to make things disappear. Students uncover the science and engineering of spy work while researching and designing nifty gizmos and gadgets that can help them discover intel, identify assets, or observe an agent while remaining unseen. *Qualifying Area: Reading*

SUBJECT: Arts and Humanities

Grades 5 – 6

Big Data: Math, Computers & Analysis

Offered: Evanston (AM, only) and Chicago

Corporations, non-profits, governmental agencies, and other analysts use "big data" to better understand everything from politics to sports, creating descriptive and predictive models to make sense of events and trends. This course explores the world of data science through a range of applications and expressions. Surveying theories of probability, students will learn how to turn data into descriptive trends and to use algorithms to make better decisions. Through case studies and individual research, identify, collect and interpret data to generate proposals for action.

Qualifying Area: Reading OR Math

SUBJECT: Technology and Engineering

In the Lab: Microscopy and the Cell

Offered: Evanston (AM and PM) and Chicago

How do scientific tools such as microscopes influence the quality of scientific observations? What are the single-celled organisms living in our ponds, lakes and the dirt beneath our feet? What are the microscopic parts of ourselves, and what do they look like? In this laboratory-based class, students learn how light microscopes work and how to operate them effectively while building an understanding of microscopic and cell biology. Students explore the vast world of microorganisms, strengthening their skills of observation and analysis by investigating busy microscopic worlds of life, such as a drop of pond water. Learn the different parts of plant and animal cells and how they function. Identify, observe, sketch and label individual organisms and cells while enhancing microscope skills. *Qualifying Area: Reading OR Math*

SUBJECT: Science

Electronics: Deconstruct and Re-invent

Offered: Evanston (AM and PM) and Chicago

Discover your "inner hacker" and learn the principles of electronics by taking apart a variety of devices and exploring how components connect to make complete circuits. Investigate circuits and manipulate sound, lights, and motion using a variety of hardware components. Develop critical thinking skills as you brainstorm solutions to real-world design problems using re-constructed parts for original projects.

Qualifying Area: Reading OR Math SUBJECT: Technology and Engineering NOTE: Additional \$10 materials fee required.

Grades 7 – 8

Biotechnology: The Helpful and the Controversial

Offered: Evanston, only (AM and PM) What are some ways that advances in biotechnology could affect society for the better? For the worse? Genetic engineering, transgenic organisms, cloning, stem cell research and DNA fingerprinting - biotechnology is changing the world as we know it. Through labs, activities, debate, and discussions, students examine the relationships among these topics, as well as their economic, social and medical impacts, and learn how this field is helping improve everyday life. *Qualifying Area: Reading OR Math*

SUBJECT: Science

Persuasion and Debate: Reason and Logic

Offered: Evanston (AM and PM) and Chicago

How do debaters back their arguments with evidence? In a workshop format, students research evidence to support their claims and engage in debate techniques grounded in rhetorical tradition. Preparation and presentation, body language, the vocal mechanism and the debate process are covered, along with active listening skills, identification of logical fallacies and argumentative writing. Topics are student-generated and provide opportunities for participants to develop and improve their persuasive communication skills. *Qualifying Area: Reading*

SUBJECT: Arts and Humanities

Wearable Technology

Offered: Evanston (AM, only) and Chicago

Wearable technology is everywhere from electronic textiles in performance art to diagnostic devices in medical clothing. Learn how this prolific medium combines hardware and software engineering as you build unique items with micro-computers, circuitry, and code. Discover how the diverse community of wearable technologists solve real-world problems with creative technology and apply those lessons to your own creative projects.

Qualifying Area: Reading OR Math SUBJECT: Technology and Engineering

NOTE: Additional \$20 materials fee required.