2021 ONLINE SUMMER CAMP

ACT English/Writing Prep (max 40 students)

High school students who are seeking admission to colleges and universities upon high school graduation take the ACT test. Through this course students can prepare for the ACT with a professional tutor! Students will learn strategies that will increase their ability to make better scores. Students will take practice tests between meeting one and meeting two and then between meeting two and meeting three.
Instructor: Mr. Dolbeare
Offered: Week 1
Virtual Meeting Days & Time: Mon, Wed and Fri at 8:00am

ACT Math Prep (max 40 students)

High school students who are seeking admission to colleges and universities upon high school graduation take the ACT test. Through this course students can prepare for the ACT with a professional tutor! Students will learn strategies that will increase their ability to make better scores. Students will take practice tests between meeting one and meeting two and then between meeting two and meeting three.
Instructor: Mr. Dolbeare
Offered: Week 1
Virtual Meeting Days & Time: Mon, Wed and Fri at 9:00am

ACT Reading and Science Prep (max 40 students)

High school students who are seeking admission to colleges and universities upon high school graduation take the ACT test. Through this course students can prepare for the ACT with a professional tutor! Students will learn strategies that will increase their ability to make better scores. Students will take practice tests between meeting one and meeting two and then between meeting two and meeting three.
Instructor: Mr. Dolbeare
Offered: Week 1
Virtual Meeting Days & Time: Mon, Wed and Fri at 10:00am

Astrobiology (max 40 students)

Ever since early humans first looked skyward and imagined the stars as distant campfires, humanity has wondered if we are alone in the Universe. Spend a week exploring life beyond our solar system including exoplanets, the Goldilocks zone, and the Drake equation.
Instructor: Mr. Dolbeare
Offered: Week 1
Virtual Meeting Days & Time: Mon, Wed and Fri at 1:00pm

Block-Based Programming with Scratch (max 25 students)

With Scratch, students can program their own interactive stories, games, and animations. Scratch helps young people learn to think creatively, reason systematically, and work collaboratively. Scratch is a project of the MIT Media Lab.
Instructor: Mr. Gaillard
Offered: Week 1 and Week 2
Virtual Meeting Days & Time: Mon, Tue, Thur & Fri at 3:00PM

Biology of Viruses and Vaccines (max 40 students)

A week of exploring the biochemistry of viruses and how we fight viruses with immunology. Students will learn the molecular biology of viruses and how a non-living matter can cause disease. Students will also learn how scientists are currently developing vaccines to fight COVID-19 and other viral pathogens.

Instructor: Mr. Dolbeare
Offered: Week 1
Virtual Meeting Days & Time: Mon, Wed and Fri at 2:00pm

Computer Basics (max 25 students)

This course helps students become more comfortable with the operation of a computer using the Windows Operating System. Students will learn about the different parts of a computer, understand how the cloud works, understand how to organize files, understand how to create and manage emails, understand how to navigate the internet safely, and they will learn various keyboard shortcuts.

Instructor: Mr. Gaillard
Offered: Week 1 and Week 2
Virtual Meeting Days & Time: Mon, Tue, & Thur, at 10:00AM

Congruence and Modular Arithmetic

Modular arithmetic is a special type of arithmetic that involves only integers. This goal of this class is to explain the basics of modular arithmetic while presenting a progression of more difficult and more interesting problems that are easily solved using modular arithmetic. Modular arithmetic is an extremely flexible problem solving tool. The following topics are just a few applications and extensions of its use: Divisibility rules, Linear congruences.

Instructor: Natalya Prokhorova
Offered: Week 1
Virtual Meeting Days & Time: Mon, Tues & Thur at 10:00AM

Creating the Unknown: An Introduction to 3D Printing (max 25 students)

'Creating the Unknown' aims to do just that – teach students how to create objects that cannot be easily found on store shelves. Students will be given a brief introduction into the world of 3D Printing, learning about the fundamental principles and evolving applications of 3D Printers. Participants will also learn how to find (and potentially design) their own objects to print, gaining the opportunity to have a chosen object printed and mailed to their home. Finally, students will learn about the future of 3D Printing and Additive Manufacturing as a whole, revealing the almost-magical powers of this up-and-coming technology.

Instructor: Cary Xiao
Offered: Week 1 and Week 2
Virtual Meeting Days & Time: Mon-Fri at 3:00PM

Diophantine Equations

A Diophantine equation is an equation relating integer (or sometimes natural number or whole number) quantities. Finding the solution or solutions to a Diophantine equation is closely tied to modular arithmetic and number theory. Often, when a Diophantine equation has infinitely many solutions, parametric form is used to express the relation between the variables of the equation. Diophantine equations are named for the ancient Greek/Alexandrian mathematician Diophantus. We will discuss Linear Combinations, Pythagorean Triples, Sum of Fourth Powers, Pell Equations, and Fermat's Last Theorem.

Instructor: Natalya Prokhorova
Offered: Week 2
Virtual Meeting Days & Time: Mon, Tue & Thur at 10:00AM

Engineering Better Devices (max 25 students) (Cost $120) (Sign-Up by July2)

'Engineering Better Devices' provides an entry-level introduction into the digital, electronic world. After building a foundation in binary information, transistors, and logic gates, students will gain the opportunity to control servos and sensors to create simple, Arduino-based devices. Participants will also learn about Single Board Computers, other types of sensors and devices, and more complex Arduino-based machines. Finally, students will discuss the future of microcontrollers and of Computer Science as a whole, showing the many vast avenues of this rapidly evolving field.

Instructor: Cary Xiao
Offered: Week 1 and Week 2
Virtual Meeting Days & Time: Mon-Fri at 1:00 PM

Exploring Psychology Week 1

Have you ever wanted to learn more about who you are as an individual, including your own development, personality, thoughts and behaviors? Studying psychology is a great way to gain greater insight into the human experience. Psychology is a fascinating subject that has practical applications in many areas of life and various aspects of who we are. This course is an introduction to the basic concepts of Psychology. Topics will focus on the basics of the human mind and behavior. Introductory topics will focus on the history and scope of Psychology, Biology of Behavior, Life Span Development, Social Psychology and Stress and Health.

Instructor: Ms. Broadus
Offered: Week 1
Virtual Meeting Days & Time: Mon, Tue & Thur at 2:00PM

Exploring Psychology Part II

This course will be an expansion from Part 1 and will include topics on Personality, Psychological Disorders, Therapy Approaches, and Prevention of Psychological Disorders.

Instructor: Ms. Broadus
Offered: Week 2
Virtual Meeting Days & Time: Mon, Tue & Thur at 2:00PM

Geometric Probability and Expected Value

We will consider Geometric Probability. Geometric probability is a tool to deal with the problem of infinite outcomes by measuring the number of outcomes geometrically, in terms of length, area, or volume. Geometric probability provides a useful approach by allowing us to transform probability problems into geometry problems. For example, "Your bus is coming at a random time between 12 pm and 1 pm. If you show up at 12:30 pm, how likely are you to catch the bus?" In this class we also consider the expected value. Expected value is the term we use to indicate the average result we would expect to get if we did a large number of trials for any experiment.
Instructor: Natalya Prokhorova
Offered: Week 2
Virtual Meeting Days & Time: Mon, Tue & Thur at 11:10AM

Invariants and Coloring Invariants

When solving a math problem where something keeps on changing, find an invariant. Invariant is something that does not change. Here is a problem. The numbers 1, 2, 3, ... 10 are written on a blackboard. On each turn, take two numbers, and replace them with their positive difference. Eventually I will only have one number left, will it be zero? The tricky part is finding the invariant in each case. Invariants, Semi-invariants, and Coloring Invariants are our mathematical topics.
Instructor: Dr. Prokhorov
Offered: Week 2
Virtual Meeting Days & Time: Mon, Wed, & Fri at 11:00AM

Java Basics (max 25 students per section)

This course reviews the basic syntax of the Java programming language. Students will learn about printing, data types, variables, user input, operators, random, conditionals, and loops. Students will also be expected to work on assignments to reinforce training topics.
Instructor: Mr. Gaillard
Offered: Week 1 and Week 2
Virtual Meeting Days & Time:
    Section A: Mon, Tue, Thur, & Fri at 9:00AM
           OR
    Section B: Mon, Tue, Thur & Fri at 2:00PM

Logarithmic and Exponential Equations

Students learn how to solve both exponential and logarithmic equations, properties of exponential and logarithmic functions. We discuss how to write an exponential growth and decay equations and how to change exponential form of equations to logarithmic form and vice versa. We solve many of different logarithmic and exponential equations and inequalities.
Instructor: Dr. Prokhorov
Offered: Week 2
Virtual Meeting Days & Time: Mon, Wed, & Fri at 1:00PM

Mathematical Games

There are many types of games considered in mathematics, and many types of game theories. This class considers only one type. In each of these games, there are two players who take turns making moves, and a player cannot decline to move. The problem always the same: to find out which player (the first or the second) has a winning strategy. We will examine the games that turn out to be jokes, games that are employing a symmetric strategy, and a method of finding winning positions.

Instructor: Natalya Prokhorova
Offered: Week 1
Virtual Meeting Days & Time: Mon, Tue & Thur at 11:10AM

Math and Logic Problems

There is something here for everyone: brain teasers, word problems and logic puzzles. Students learn problem-solving strategies, and how to solve symbolic logic problems. We also discuss conjunction, disjunction, negation, implication and Venn diagrams.

Instructor: Dr. Prokhorov
Offered: Week 1
Virtual Meeting Days & Time: Mon, Wed, & Fri at 9:00AM

Plan for Success! (max 25 students)

What is something most successful people have in common, whether they are engineers, athletes, business professionals or artist? They make the most of their time! This class will give you the keys to success by learning how to maximize your time. You will identify valuable resources that excite, challenge and inspire as you learn to create a rhythm in your schedule. You will learn how to control your own time, ditch stress, get ahead of the game, and set yourself up for success.

Instructor: Ms. Broadus
Offered: Week 1 and Week 2
Virtual Meeting Days & Time: Mon, Tue and Thur at 9:00am

Python Basics (max 25 students per section)

This course reviews the basic syntax of the Python programming language. Students will learn about printing, data types, variables, user input, operators, random, conditionals, and loops. Students will also be expected to work on assignments to reinforce training topics.

Instructor: Mr. Gaillard
Offered: Week 1 and Week 2
Virtual Meeting Days & Time:
      Section A: Mon, Tue, Thur & Fri at 8:00AM
                OR
      Section B: Mon, Tue, Thur & Fri at 11:00AM

Science of Super-villians (max 40 students)

A week of examining the science of super-villians including at home lab sessions. Each day we will focus on a different supervillain and learn both their backstory and the science behind their dastardly plans.

Instructor: Mr. Dolbeare
Offered: Week 1
Virtual Meeting Days & Time: Mon, Wed and Fri at 12:00pm

Social – Know How (max 25 students)
This course will explore skills that will assist students in improving basic social interactions and effective communication. Students will participate in interactive activities that will increase their self-esteem, aid in the development of friendships, stress reduction and conflict resolution.
Instructor: Ms. Broadus
Offered: Week 1 and Week 2
Virtual Meeting Days & Time: Mon, Tue and Thur at 10:30am

Topics in Geometry. Pick's theorem and Lattice Polygons.
Pick's theorem provides a simple formula for calculating the area A of a polygon whose vertices have integer coordinates (lattice points). The area of the polygon is I+P/2-1 where I is the number of lattice points inside the polygon and P is the number of lattice points on the perimeter of the polygon. Our geometry topics: Calculation of Areas of Polygons. Geometric Constructions. Euler's Theorem and more.
Instructor: Dr. Prokhorov
Offered: Week 1
Virtual Meeting Days & Time: Mon, Wed, & Fri at 1:00PM

Trigonometric Equations and Inequalities
Trigonometric equations are an important and challenging part of a trigonometry course. Students learn how to solve trigonometric equations and how to use trigonometric identities to solve math problems. We discuss strategies for solving equations and inequalities involving trigonometric functions
Instructor: Dr. Prokhorov
Offered: Week 1
Virtual Meeting Days & Time: Mon, Wed, & Fri at 11:00AM

Webpage Basics (max 25 students)
This course will teach students how to use Bootstrap with VS Code. They will learn how to setup a webpage using the most popular syntax.
Instructor: Mr. Gaillard
Offered: Week 1 and Week 2
Virtual Meeting Days & Time: Mon, Tue, Thur & Fri at 1:00PM