

CENTER FOR K12 STEM EDUCATION

# HIGH SCHOOL SUMMER PROGRAMS



**Get a preview of an authentic college STEM experience with NYU.**

You can live in one of the world's greatest living urban labs and learn critical skills directly from people on the front lines of cutting-edge research and innovation in Science, Technology, Engineering, and Math.

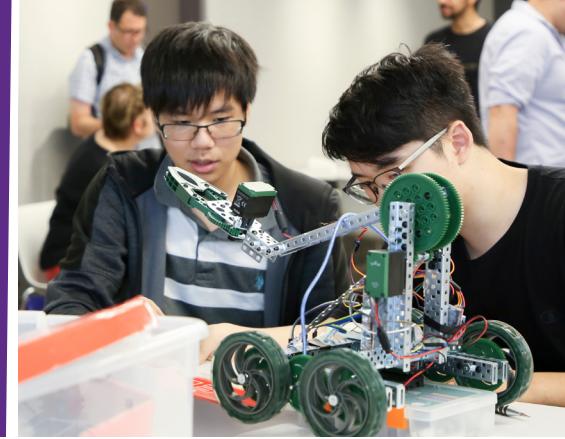
The NYU Tandon Center for K12 STEM Education Summer STEM programs are engaging, hands-on experiences designed by actual NYU researchers and engineers, and participating students tackle real-world problems while learning in-demand STEM skills. Deploying the actual tools of scientists and engineers — from microcontrollers, electronic components, and actuators to high-end testing and experimental

equipment — they gain experience in vital areas like robotics, connected devices, virtual reality & gaming, and artificial intelligence.

Our two-week summer programs will help you learn to think critically, harness your creativity, and become an effective problem-solver — and maybe even open up pathways to life-changing and world-saving careers.

We offer a suite of tuition-based full-day experiences open to all rising 9th- to 12th-grade students from around the world, country, and neighborhood. We welcome residential and day students, and minimal to no prior engineering or programming experience is required. Students live and learn at the NYU Tandon School of Engineering campus in Downtown Brooklyn. Brooklyn is the fastest-growing hub of technology in the country, with a thriving innovation ecosystem that is home to a multitude of pioneering businesses and start-ups. Each program lasts two weeks and is offered three times during the Summer of 2020:

June 22-July 3 • July 13-24 • August 3-14



## Summer Program in Automation, Robotics, and Coding (SPARC)

The NYU Tandon Summer Program in Automation, Robotics, and Coding (SPARC) introduces high school students to the basics of robotics, mechatronics, and programming. SPARC has been designed keeping in mind that learning by doing is the best way to teach new concepts. Throughout the program, the focus will be on providing extensive hands-on experience to students through a series of activities tailored especially for challenging young minds and encouraging out-of-the-box thinking.

Students will learn how to use microcontrollers, interface sensors, and actuators. Along with practical experience, they will be given insight into the history of robotics and a glimpse of what the future holds for the automation industry.

## Internet of Things (IoT): Connecting the Cloud, Your World, and You

From smart appliances to home automation systems, new IoT capabilities enable us to intelligently gather information through advanced sensors and provide valuable information to anyone from anywhere. The NYU Tandon Department of Electrical and Computer Engineering Internet of Things (IoT) Summer Challenge Program is open to students interested in designing and building a connected device and curiosity about the capabilities of IoT science and technology to help solve social problems.

Imagine designing a small device that informs you of a frozen water pipe in your home before a potential flooding disaster. Imagine sending a text message to the same device while you're on vacation, and turning on the heat or closing the water valve. Throughout the program, the focus will be on understanding the scope of IoT; revealing the underlying principles and architecture of its networks, devices, programming, data, and security; and introducing these challenges to students through a series of activities tailored especially to promote creative computational thinking.

## Machine Learning

The NYU Tandon Summer Program in Machine Learning introduces high school students to the computer science, data analyses, mathematical techniques, and logic that drive the fields of machine learning (ML) and artificial intelligence (AI). Whether they realize it or not, people experience these evolving fields regularly: in video and image recognition technologies, interactive voice controls for homes, autonomous vehicles, real-time monitoring and traffic control, cutting-edge diagnostic medical technologies, and other aspects of our daily lives.

Developed by Tandon faculty in the Electrical and Computer Engineering and Mechanical Engineering departments, this program offers a unique opportunity to learn directly from some of today's most innovative researchers. Students will gain knowledge of core principles in machine learning such as model development through cross validation, linear regressions, and neural networks, and will gain an understanding of how logic and mathematics are applied both to "teach" a computer to perform specific tasks on its own and to improve continuously while doing so.

## Pixels, Bits & Blocks: Summer Courses @ IDM

New in 2020, the summer courses in Integrated Digital Media (IDM) offer three ways to immerse students in designing and implementing emerging media technologies.

### Track 1: Virtual Reality

Virtual Reality, the use of computer technology to create an immersive 3D environment, has cutting-edge applications across a spectrum of fields like education, healthcare, entertainment, fashion, business and engineering — think everything from battling invaders in a video game setting so real you'd swear you were there to doctors performing surgery from remote locations.

This course is designed to introduce students to using VR as an interactive storytelling and

marketing medium and will provide historical context, hands-on instruction in the NYU Integrated Digital Media XR Lab, and more. Students will work at the crossroads of tech and art, based on their interests, to create virtual objects and experiences and learn the core concepts of VR production and interaction.

### Track 2: Creative Wearable Tech

Have you ever used a mouse, trackpad, or keyboard to interact with a computer? How about a game controller to interact with a console? Have you ever worn a Fitbit or an Apple Watch? Chances are these electronic objects have taken a common form—a printed circuit board enclosed within a hard plastic shell—but it's possible to make wearables and controllers that are much more creative.

This course invites students to consider domestic and wearable electronics from a design perspective, using physical computing. Students will learn how wearable technology can extend beyond fashion to include custom game controllers, alternative computer interfaces, health tech, performance, and art.

### Track 3: Interactive Fiction and Narrative-Driven Game Design

The NYU Tandon Summer Program for Narrative-Driven Game Design introduces high-school students to the fundamentals of two-dimensional, story-driven game design. During the course, students will learn to create games with engaging and interactive stories driven by interesting characters, complex world-building, and rich lore to motivate players to keep playing.

Students will learn essential skills for becoming a great storyteller through interactive technologies with a series of individual and collaborative projects. This course will help participants develop the world-building and scripting abilities necessary to create visual stories, interactive narratives, and virtual realms through a variety of software tools and platforms.