



# BERGEN COUNTY ACADEMIES

## CLASS of 2017 PROFILE



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### SCHOOL AND COMMUNITY

A model for innovation and reform in the 21st century, Bergen County Academies (BCA) is a free public magnet high school of choice for Bergen County residents. BCA has an enrollment of 1,050 students and features 7 career-focused academies operating as a cohesive unit to provide a dynamic, specialized, student-centered environment. BCA has an extended school day from 8:00 am until 4:10 pm. Underclassmen, grades 9-11, devote Wednesday mornings to interdisciplinary projects and independent research, while all of our seniors devote Wednesdays to a yearlong individualized internship experience in the NY/NJ metropolitan area.

### BCA HIGHLIGHTS

- A diverse public magnet high school which typically accepts 17% of the over 1600 students who apply
- Ranked #5 in the Nation on the 2015 list of America's Top High Schools by Newsweek
- Ranked #15 in Best High Schools 2016 STEM rankings in the Nation by US News & World Report
- Home of 39 National Merit Semifinalists
- Home of two U.S. provisional patents based on in-house student research
- Named a 2015 National Blue Ribbon "School of Excellence" by the U.S. Department of Education
- Named a Model School in the Arts by the N.J. Department of Education
- Home of 2016 ISEF Best in Category Biomedical & Health Sciences Winner
- Home of a 2015 Gold Medal Winner of the International Math Olympiad
- Home of two 2014 National Intel Science Talent Search Finalists
- Home of the 2013 Winner of the International Biology Olympiad
- Member of the National Consortium of Secondary STEM Schools (NCSSS)

To schedule a school or virtual visit, please email our College Center Coordinator, Silvana Forne-Neves at [silfor@bergen.org](mailto:silfor@bergen.org). We look forward to hosting you on our campus!

### ONE SCHOOL, SEVEN ACADEMIES

#### CEEB Codes:

- 310449:** Academy for the Advancement of Science & Technology  
Academy for Engineering & Design Technology
- 310451:** Academy for Culinary Arts & Hospitality Administration  
Academy for Technology & Computer Science  
Academy for Visual & Performing Arts
- 310452:** Academy for Medical Science Technology
- 310454:** Academy for Business and Finance/  
International Baccalaureate

### BCA • ACT / SAT COMBINED TEST RESULTS

Test	State	Nation	BCA
ACT	23.2	21.0	32.5
SAT	1100*	1090*	1425
EBRW	560*	550*	695
M	550*	540*	735

\*estimate based on concordance tables

SAT Subject Tests	State	Nation	BCA
Biology - Ecology	647	625	679
Biology - Molecular	674	652	716
Chemistry	674	666	743
English Literature	630	618	682
Math Level II	703	690	755
Physics	668	667	725

### School Counselors

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## Curriculum

The program of study at the academies is college preparatory with a career focus. It includes a strong core curriculum that exceeds state graduation requirements balanced with academy specific courses and electives. Transdisciplinary class-wide projects, from 9th through 11th grade, develop teamwork, communication and presentation skills, promoting an integrated, multi-dimensional approach to learning. All academic courses are taught at the honors level, with some taught above the AP level. The Academy for Business and Finance awards the full IB Diploma Program, while students in all other academies may take a combination of AP and IB courses. Due to the number of core requirements, even the most ambitious students may have limited access to AP and IB courses.



### Highest Level Courses Available

Advanced Math Topics	Lin Alg/Diff Equation	Organic Chemistry
AP Calculus BC+	Multivariable Calculus	Research
Data Structures	Nanotechnology	Topics in Adv Math

### Advanced Placement Courses

AP Art History	AP Computer Science	AP Physics C
AP Biology	AP Macro Economics	AP Psychology
AP Calculus AB, BC	AP Micro Economics	AP Statistics
AP Chemistry	AP Music Theory	AP Studio Art

### International Baccalaureate Courses

IB Economics	IB History	IB Physics
IB Environmental Systems	IB Literature	IB Spanish
	IB Math	IB French

**AP Results:** 879 Tests were taken  
Nearly 90% of all scores were 3 or above

**IB Results:** 582 Tests were taken  
Nearly 75% of all scores were 4 or above

Due to the number of core course requirements, even the most ambitious students may only take one Advanced Placement (AP) course or one International Baccalaureate (IB) course beyond the requirements.

## RESEARCH

The Research programs at BCA operate within highly sophisticated, state-of-the-art laboratories that have been designed and equipped to allow exploration within a variety of disciplines. The labs are functional, professional entities, not normally found in a high school setting. They include agriscience, mechatronics, optics, nanotechnology, stem cell research, the nano-structural imaging lab, which includes a Scanning Electron Microscope (SEM) and Transmission Electron Microscope (TEM), the Financial Markets Lab, equipped with a Bloomberg workstation and a variety of other research opportunities. Many of our students have won significant national and international awards, and some have been able to publish their findings in professional journals.



## SENIOR EXPERIENCE INTERNSHIPS

All of our seniors devote Wednesdays to a yearlong individualized internship experience. Students receive (9) academic credits for this supervised graduation requirement. Over two hundred employers offer experiential learning opportunities in research centers, hospitals, universities, non-profit organizations, government agencies, major corporations and large and small businesses in the NY/NJ metropolitan area.

## ELECTIVES

BCA students enrich their education and pursue their interests by selecting from an array of electives in art, humanities, math, research, science, and technology. Students can choose from over eighty elective courses in visual, performing, and culinary arts, music, physics, engineering and robotics, computer science, psychology, business, the study of languages and cultures, agricultural science, biology, and chemistry. Students may also elect to do research in biology, nanotechnology, mechatronics, physics, psychology, or agricultural science.

## CLUBS

With over 100 different clubs to choose from, ranging from human and animal rights to chess and Rubik's Cube strategies, students have multiple opportunities to establish leadership skills and explore additional interests not necessarily covered in their academic curriculum. Most clubs are student-initiated and some students stay with a club for every year of their time at BCA while others investigate a new club each trimester.

## ACADEMIES:

### AAST

Students in the Academy for Science and Technology (AAST) have a passion for science and a curiosity to explore modern scientific questions through a comprehensive, hands-on curriculum. The AAST core curriculum incorporates classes taken with other academy students while emphasizing its own academy focus. For example, AAST students take multiple years of biology, chemistry and physics together with AEDT students while completing studies in chemical engineering, microscopy, organic chemistry and modern physics particular to AAST. Graduates from AAST are prepared to continue studies across a wide range of scientific disciplines or to pursue areas such as medicine, law and public policy which will continue to be informed by the sciences as the 21st century progresses.

During the freshmen year, AAST students learn the theories and techniques necessary to complete real-world investigations in nanotechnology, biotechnology, chemistry, microscopy and optics.

AAST sophomores explore the practical and environmental considerations involved in scaling experiments from the small classroom laboratory to the large industrial production plant.

Junior and Senior students extend their theoretical knowledge and laboratory skills to the study of organic chemistry and can choose among several AP or IB science

electives. Throughout the curriculum, students are encouraged to find original answers to modern research challenges using the state-of-the-art facilities available on campus.

### **ABF/IB**

The Academy for Business and Finance (ABF) provides an introduction to the world of business in addition to a comprehensive academic program. Students have a strong aptitude for mathematics, possess advanced writing skills, and are interested in business, finance, marketing, and economics. Business principles are taught in multiple, high-level core courses which incorporate topics such as: the global business environment, management, marketing, finance, economics and entrepreneurship. ABF students often become involved in a variety of national and international business and economic competitions such as the High-School Federal Reserve Bank Challenge and the Fairleigh Dickinson University Business Idea program. They also participate in nationally-recognized business organizations such as DECA.

ABF has incorporated an emphasis on a global perspective. The driving force behind this global component is the integration of the International Baccalaureate Diploma Program, in which all ABF 11th and 12th graders enroll, to an already rigorous course of study.

A unique feature of our Academy is the Financial Markets Lab. Our lab is equipped with Bloomberg technology, a resource utilized by finance professionals worldwide; it enables our students to conduct economic and financial research and analysis using real-time economic and market data and sophisticated analytic tools. Our proximity to New York City offers our students opportunities to visit some of the world's leading financial institutions. Furthermore, our global exchange program offers students the opportunity to gain exposure to the international business community.

### **ACAHA**

Academy for Culinary Arts and Hospitality Administration (ACAHA) students have a strong interest and passion for culinary arts as well as hospitality administration. ACAHA offers an honors-level core curriculum augmented by elective options in all facets of hospitality, management, customer service, entrepreneurship, and advanced culinary / pastry arts.

Students train in a sophisticated culinary facility that rivals many professional restaurant sites. The curriculum includes foundations of hospitality and restaurant management. Electives in AP Micro and Macro Economics are emphasized. The course of study leads to certification from the National Restaurant Association Education Foundation, which can lead to hospitality scholarship opportunities. Articulation agreements with universities enable students to receive some college credit. For students interested in a career in hospitality management or the culinary arts, ACAHA offers the best possible preparation for college hospitality programs. While at the Academies, ACAHA seniors have interned at Restaurant Daniel, the Loews Regency Hotel and the New York Hilton.

### **AEDT**

The Academy for Engineering and Design Technology (AEDT) was developed as an extension of AAST with specific concentration in the engineering sciences, including design

technology, computer science, manufacturing, electronics, and biomedical engineering. Students in this academy have a concentration in engineering and design courses and focus on skills which are generally useful in any engineering curriculum.

Students are drawn to the Engineering Academy because they like to create, build, or reverse-engineer. They have the opportunity to do this in state-of-the-art classrooms and laboratories. Projects include product development, civil or architectural designs, robotic competitions, and much more. Students have a strong desire to solve problems using math, science, and technology. They like to work with their hands, and apply their creativity to engineering.

AEDT focuses on general engineering disciplines and prepares students for entrance into college engineering programs. While not everyone in this academy will pursue engineering, those that choose to do so have a solid background in the field and are likely to successfully master college courses. Students are also prepared to pursue careers in the technical aspects of business or law. Articulation agreements with universities enable AEDT students to receive college credit for some of the core courses taken in this program.

### **AMST**

The Academy for Medical Science Technology's program of study is a system-based approach to medicine that allows students to study advanced science and lab-based classes in an integrated format. Freshman are introduced to medical terminology and techniques during their year-long Medical Science Seminar in which they are exposed to Epidemiology, Research Methods and Pharmacology, while concurrently taking high level courses in Biology and Introduction to Chemistry. Once students have the basics mastered, they amp up the rigor during their preceding years with requirements including: BioTechnology Lab, Anatomy and Physiology, Intermediate Chemistry, Introduction and Intermediate Physics and various biology electives. Students culminate their scientific study with a required year-long AP or IB science class in their senior year.

Many AMST students supplement their curiosities in science and medicine by participating in research. The research programs at the Bergen County Academies operate within highly sophisticated, state-of-the-art laboratories that have been designed and equipped to allow exploration within a variety of scientific disciplines. The labs are functional, professional entities, not normally found in a high school setting. They include cell and molecular biology, nanotechnology, microscopy and a variety of engineering programs. Many of our students have won significant national and international awards, and some have been able to publish their finding in professional journals.

One of the capstone programs for students in AMST and our research program, is our selective Introduction to Surgical Techniques course. In partnership with Englewood Hospital, students permitted to take this class train with surgeons and are taught technical methods to perform surgery on rats under the supervision of trained professionals.

### **ATCS**

The Academy for Technology and Computer Science (ATCS) offers a curriculum that provides students with a strong

foundation in the core concepts of computer science, experience in a broad variety of programming skills and paradigms, and a focus on the application of programming to practical challenges.

ATCS students develop a strong foundational understanding of programming, computer architecture, data structures and algorithms, and program analysis. Throughout their careers at BCA, students extend their skills in computing through projects and electives of their choice, often including processor design, web application development, robotics, computer security, and mechatronics.

Because of their strong backgrounds in computer science, ATCS students have competed successfully in prominent competitions such as The International Computer Science Olympiad, Panasonic Challenge, National Center for Women & Information Technology, the Future Business Leaders of America Competition, and the American Computer Science League.

The program is oriented around underlying ideas that will never become obsolete, even as technologies change. ATCS students will be well prepared for a college major such as computer science, computer engineering, or information systems. Those who decide not to pursue computer-related careers in the future will find that the technical skills they have acquired through the academy's curriculum will prove to be useful in a number of other fields.

## AVPA

The Academy of Visual and Performing Arts (AVPA) encompasses animation, computer graphics, film, music, studio arts, theater and video production. In these creative disciplines that require both craftsmanship and creative thinking, students are provided with exposure and experience to the Arts. Students in this academy have to choose one of the three concentrations– Music, Theatre, and Visual.

### Music

Students in the Academy for Visual and Performing Arts – Music (AVPA–M) have an outstanding ability in music and are the strongest musicians in their communities. Students in this program study an academic, honors–level college preparatory curriculum with a focus in music

Ninth graders begin the program by enhancing their keyboard / piano skills in Digital Keyboarding. They also take Musicianship. In this exciting methods course, students learn woodwind, brass, string and percussion instruments. Conducting is also an important part of the course, as is rhythm dictation and score reading/interpretation. The course ends with a special project in the music technology field. Tenth graders learn current technological and compositional techniques in Electronic Music Synthesis. Students work with state-of-the-art software such as Finale and Pro Tools. The course culminates with each student completing a formal composition. The AVPA–M program ensures a rounded arts education with Music and Society: a course that teaches the evolution of the style with the corresponding art and sociopolitical trends. In eleventh grade, students take AP Music Theory in the Digital Age. They study music theory at the college–level, including harmonic analysis, counterpoint, voice leading and ear training. An exhibition of students' digital compositions is also part of the curriculum.

In twelfth grade, students go beyond the AP theory curriculum in Advanced Problems in Music Theory & Technology. Here, students delve into augmented sixth and Neapolitan chords, fugal composition techniques, and analysis of twentieth century music. Twelfth graders complete the program with Senior Music and Media Seminar, where they present a lecture, recital or build a musical instrument! The AVPA–M program is not a conservatory or a full–time performing arts program– they offer a college preparatory, academic honors program, with a focus in music.

### Theatre

The AVPA theatre arts concentration is a training program for students interested in pursuing a college major in theatre or film leading to a career in some aspect of those fields. Core courses include sequences in acting, voice and speech, theatre history, dramatic writing and directing. In addition to studying with faculty members, AVPA theatre students work with industry professionals in the study of dance, musical theatre, technical theatre and design, and the business of theatre. Students are required to participate, either as performers or technicians, in at least one major theatrical production each year.

Our goal is to nurture creativity and imagination, develop skills and discipline and emphasize process. Rather than provide students with a single technique we introduce young artists to a variety of methods (including improvisation, Viewpoints, Stanislavsky technique, Linklater, and physical style techniques), encouraging them to learn to work in ways most productive for their individual growth.

Theatre concentration students will be well prepared to audition for college and conservatory Theatre Arts programs (BA and BFA). AVPA theatre students, because of their course of study, will be ready for almost any college major or career path encountered in the 21st Century.

### Visual

The AVPA visual arts concentration contains a mix of traditional and digital design and production, with a strong emphasis on digital. The program is designed for students interested in pursuing a college major in any one of a broad range of arts including graphic and web design, illustration, photography, film/animation/video, game design, package design, traditional/fine arts, art history, and so much more. All of the courses help students develop creativity and critical thinking skills, tools to help them succeed in any major or career, including related fields like architecture, engineering, and computer science.

The Visual Arts concentration is a college preparatory program specializing in the latest advances in the arts, including 2D and 3D animation, print/digital publishing, and multi–media. Students study every essential aspect of the visual arts field through immersion in a curriculum that embraces these new technologies, while still emphasizing traditional skills and principles of art and design. Some of the latest areas of research include development with Maya 3D modeling software, Unity game development software, Oculus Rift virtual reality headsets, and Arduino programming to create immersive, virtual reality experiences in conjunction with Ellis Island and the National Park Service.