BERGEN COUNTY ACADEMIES

2024-2025 INFORMATION AT A GLANCE



BERGEN COUNTY TECHNICAL HIGH SCHOOL DISTRICT Dr. John Grieco Campus • 200 Hackensack Avenue, Hackensack, New Jersey 07601 201-343-6000 • www.bergen.org











The Bergen County Technical School District does not discriminate on the basis of race, age, creed, religion, ancestry, national origin, socioeconomic status, affectational or sexual orientation, gender, disability, or marital status.

AN ACADEMIES EDUCATION

The Bergen County Academies offers students a unique high school experience that combines comprehensive academics with technical and professional courses. We encourage our students to choose an academy concentration based upon their interests rather than a future career choice.

Pursue your passion for science, art, computers, music, theatre, cooking, design, or finance—our programs will allow you to explore your interest while preparing you to meet the academic challenge of college. You may complement your studies with electives and clubs that cross academy boundaries; you are not limited to study in just one field. Students receive a fine academic background that prepares them well for postsecondary study in any field they choose.

THE ACADEMIES:

AAST

Academy for the Advancement of Science and Technology

ABF Academy for Business and Finance

ACHA Academy for Culinary Arts and Hospitality Administration

AEDT

Academy for Engineering Design Technology

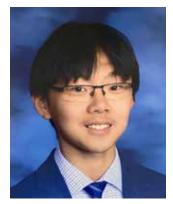
AMST Academy for Medical Science Technology

ATCS Academy for Technology and Computer Science

AVPA

Academy for Visual and Performing Arts

For information on our curriculum and laboratory facilities, please visit our website: http://bcts.bergen.org.



"Graduation's a time filled with many changes, but I urge you all to never lose our core traits. Keep uniting with your future peers to build communities that bring life to wherever you go, and I'm confident that we, the BCA class of 2024, will continue to make something great every single day." Justin Zhang, BCA Class of '24

"Never underestimate the power of your passions. Discover what truly motivates you and fuels your curiosity and pursue it. Your passions have an incredible capacity to make a difference in the world." Mark Leschinsky, BCA Class of '24





Dr. John Grieco

Beginning in 1984, Dr. Grieco was Chief School Administrator for BCA's conceptual predecessor, Bergen County Technical Schools. Through his educational programs Dr. Grieco sought to expose his students – young, old, gifted, underprivileged, disabled, driven, lost – to the various complexities and attending simplicities he knew make up life. He did it fruitfully and with little credit, but for the reward of having beautifully shaped minds.

PROGRAM DESCRIPTIONS

This guide is designed to provide students and parents/guardians an understanding of our programs. Bergen County Academies takes pride in the high standards achieved year after year. Information in this booklet may be subject to change as our programs evolve to match skills dictated by new technologies.

For complete program descriptions, please visit our web site: http://bcts.bergen.org

AAST ACADEMY FOR THE ADVANCEMENT OF SCIENCE AND TECHNOLOGY



Students applying to the Academy for Science and Technology should have a passion for science and a curiosity to explore modern scientific questions through a comprehensive, handson curriculum. Students take multiple years of instruction in the core sciences of biology, chemistry and physics while addressing 21st century science and technology themes in sustainability, material science, and energy. In addition to the traditional honors-level coursework in the STEM-related areas of math and computer science, a wide range of core and elective offerings in the humanities and the arts can be an important part of any AAST student's experience. Graduates from AAST are prepared for further studies across the entire curriculum and especially within the natural sciences, energy engineering, and sustainability. The following are some of the highlights of the AAST curriculum:

• 9th grade students begin their multi-year study of the natural sciences by taking biology, chemistry, and a dedicated science lab period

- 10th grade students take AP Chemistry, begin studies in physics, and continue with a dedicated lab period
- 11th grade students take Sustainable Chemical Processes, a course in advanced physics, and often enroll in their choice of an AP elective
- 12th grade students continue their exploration of sustainable chemical processes in Inorganic Chemistry and Resource Applications and Alternative Energies. Throughout the curriculum, students are encouraged to find original answers to modern research challenges using the state-of-the-art facilities available on campus

Many of the AAST faculty hold doctorates in their areas of expertise. Additionally, through our senior experience program and academic collaborations, students have unique opportunities to interact with outside experts from institutions including Columbia, Princeton, Stevens, and the American Museum of Natural History among many others. Whether they continue in a STEM-relate field or choose another area, AAST graduates possess the knowledge, skills, and experience to succeed in their post-secondary studies and beyond.



ABF

ACADEMY FOR BUSINESS AND FINANCE (INTERNATIONAL BACCALAUREATE)



This Academy provides a focus on business and finance within an integrated and comprehensive academic program. Students typically have a strong aptitude for mathematics, possess advanced writing and communication skills, and are interested in business, finance, marketing, and economics. Business principles are taught in multiple, high-level core courses which incorporate disciplines such as: corporate finance, financial markets, money and banking, economics, marketing, management information systems and entrepreneurship. Students often become involved in a variety of national and international business and economic



competitions such as the High-School Federal Reserve Challenge, the Euro Challenge and the Fairleigh Dickinson University Business Idea program. They also participate in nationallyrecognized business organizations such as DECA (an association of marketing students).

ABF has incorporated an emphasis on a global perspective. The driving force behind this global component is the integration of the International Baccalaureate curriculum within an already rigorous course of study. The IB Diploma Program, in which most ABF 11th and 12th graders enroll, is an internationally recognized degree program administered by the International Baccalaureate Organization in Geneva, Switzerland. To earn the IB diploma, students must complete a two year

sequence of courses in humanities, math, and science. In addition, ABF students are required to complete a senior thesis and a unique class on interdisciplinary analysis, as well as requirements in the arts, community service, and athletics.

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 and establish internships with some of the world's leading financial institutions. Furthermore, our global studies program offers students the opportunity to gain exposure to the international business community.



ACHA ACADEMY FOR CULINARY ARTS AND HOSPITALITY ADMINISTRATION



This Academy provides an insight into the Hospitality Industry in addition to an in-depth study of all facets of hospitality management, entrepreneurship, and advanced culinary / pastry arts. This academy is ideal for those who are passionate about hospitality; one of the largest global industries and employers. ACHA students often become involved with a variety of leadership, community service, state and national competitions such as the ProStart Hospitality Management state and national competition and the state and national SkillsUSA Leadership Conferences.

Students train in a sophisticated culinary facility that rivals many professional restaurants. The curriculum includes Foundations of Hospitality and Restaurant Management along with International Baccalaureate business management courses. International Baccalaureate Diploma is optional for ACHA students. Electives in AP Micro and Macro Economics are recommended. The ACHA course of study leads to certification from the National Restaurant Association Education Foundation, which can lead to hospitality scholarship opportunities. The students will be enrolled in an online class and receive a ServSafe Managers certification. Articulation agreements with universities enable students to receive college credit or advanced standing. One of the highlights of the ACHA experience is taking part in the coveted annual BCA Chocolate Competition. Their artisitic creations are often compared to cake projects on the Food Network!

For students interested in a career in hospitality management or the culinary arts, ACHA offers the best possible preparation for college hospitality programs such as Cornell University's School of Hotel Administration, Boston University, NYU, Penn State University and the Ecole hoteliere de Lausanne (EHL) in Switzerland, to name a few. While at the Academies, ACHA seniors take part in BCA's Senior Experience program and have interned at the Black Barn Restaurant, the Loews Regency Hotel, the New York Hilton Hotel, the Pearl River Hilton, and the Glenpointe Marriott.

AEDT ACADEMY FOR ENGINEERING AND DESIGN TECHNOLOGY

The Academy of Engineering and Design Technology (AEDT) was developed as an extension of the Academy for the Advancement of Science and Technology (AAST) with specific concentration on the engineering sciences, including design technology, computer science, manufacturing and electronics. Students have a concentration in engineering and design courses and a focus on skills that are generally useful in any engineering curriculum.



Students are drawn to AEDT because they want the opportunity to create and build in innovative classrooms and laboratories. Projects include product development, civil or architectural designs, robotic competitions, and more. Students must have a strong desire to solve problems using math, science and technology. They should like to work with their hands, and apply their creativity to engineering. Organizational skills, such as maintaining computer files, keeping project journals and building portfolios are needed.

AEDT focuses on general engineering disciplines and prepares students for entrance into college engineering programs. Those that choose to go into this academy will have a solid background and are likely to successfully master college engineering courses. Students are also prepared to pursue careers in the technical aspects of business or law. Articulation agreements with universities enable students to



receive college credit for some of the core courses taken in this program.

AMST ACADEMY FOR MEDICAL SCIENCE TECHNOLOGY

The program of study for the Academy for Medical Science Technology is designed for students interested in the medical field and/or the research sciences. The curriculum is infused with courses that reflect a medical science related focus including anatomy, pharmacology, bioethics, epidemiology, and research science as well as projects that develop teamwork, communication and presentation skills.



- In ninth grade, students have two full year STEM courses, Honors Biology and Experimental Biology which rotates students through the three cell biology laboratories. Experimental Biology includes elements of bioinformatics, experimental design, basic laboratory skills, cell and molecular research techniques, statistics, data analysis and presentation.
- In tenth grade, students take a full year of Anatomy and Physiology in addition to a full year course in Chemistry. A hands-on, lab-based course, Anatomy and Physiology provides a firm foundation in histology, physiology, and homeostasis in each of the human body systems.
- In eleventh grade, students will take Advanced Placement level Biology, in addition to a full year course in Physics. They also have the option of pursuing other Advanced Placement course offerings.
- In grade twelve, students will rotate through an Advanced Biomedical Seminar which includes a trimester each in topics such as Epidemiology, Pharmacology, and Bioethics. They also

have the option of pursuing other Advanced Placement course offerings.

Many AMST students participate in the "in-house" research program in the Academy's state of the art labs, as early as freshman year. Research focus options include cell and molecular biology, nanotechnology, agriscience, optics, mechatronics, psychology, mathematics, and a variety of engineering disciplines. In the cell and molecular biology labs, students use in vitro cell culture and carry out such assays as microarray and transfection and utilize TEM and SEM to investigate the scientific question they are addressing. Our students have won significant national and international awards at competitions including the Regeneron Science Talent Search, the Regeneron International Science and Engineering Fair, and BioGENEius. These high school innovators have been awarded Davidson Fellowships and have presented their research at meetings of professional organizations such as the American Association for Cancer Research (AACR). Many students have published their findings in peer reviewed, professional journals.

AMST students can participate in HOSA, the international leadership organization for future healthcare professionals, which is recognized by the US Department of Education. The mission of the chapter is to promote the health care professions and community service. Members have successfully competed at the international level in areas such as Biomedical Debate, Creative Problem Solving, Pharmacology, Biomedical Lab Science, Nutrition, Sports Medicine, Mathematics, Dental Science and many more.



ATCS ACADEMY FOR TECHNOLOGY AND COMPUTER SCIENCE

This program is ideal for students who have an interest in computers and programming. The Academy for Technology and Computer Science 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, software engineering practices, data structures and algorithms, web development, theory of computation, and program analysis. Throughout their careers at BCA, students extend their skills in computing through projects and electives of their choice, including such offerings as processor design, computer security, game development, and artificial intelligence.

The specific programming languages and development tools in the curriculum change frequently, though they are not the heart of what our students learn. Our real focus is on important, fundamental ideas in the field of computer science, not just the latest trends in technology. Even though the tools we use are always changing, students can have confidence that the important ideas they learn in ATCS will never become outdated or obsolete.



- Ninth graders take AP Computer Science A. The year begins with a gentle introduction to a CS-approach to problem solving. By trimester two, the pace will increase, with a focus on learning all of the AP CS A topics, including arrays, 2d arrays, iteration, methods, objects, inheritance, and a bit of recursion.
- Tenth graders take Applied Computer Science. The course has two primary components. One part includes some common data structures and standard algorithms associated with those structures; including stacks, queues, linked lists, trees, heaps, and maps. The other part introduces students to relational database design and queries. Students build web applications connected to these databases.



- Eleventh graders take Advanced Topics in Computer Science, a focus on the mathematics and theoretical underpinnings of computer science. During this year, students primarily work in functional languages. Students also examine in depth how we can prove assertions about code while also exploring the fundamental capabilities (and limitations!) of computers.
- Twelfth graders pull together everything that they've learned by building a real-world product known as a Capstone. In the process, they research new technologies, learn industry-level methodologies for client and team collaboration, and finally present their complete product to industry professionals.

Because of their strong backgrounds in computer science, ATCS students have competed successfully in prominent competitions such as USA Computing Olympiad, American Computer Science League, Congressional App Challenge, Canadian Computing Competition, and picoCTF.

ATCS students are well prepared for any college computing major such as Computer Science, Computer Engineering, Electrical Engineering, Software Engineering, or Information Systems. Additionally, computers have worked their way into every facet of modern life. Even those students who decide not to pursue computer-related careers after high school still find that the technical skills they have acquired through the academy's curriculum prove immensely useful in any number of other fields.



AVPA ACADEMY FOR VISUAL AND PERFORMING ARTS

AVPA offers three areas of concentration: Music. Theatre Arts, and Visual Arts.

What is the AVPA-Music Program? Students in this program study an academic, honors-level college preparatory curriculum with a focus in music. Students have core academic courses (usually at the honors level) as well as core music courses! The program is for students who possess a combination of musical talent, passion, and activism, and immerse themselves in music activities. In addition to the regular BCA admission process, candidates must also undergo a music audition. More information is available online: www.bergen.org/music.

- 9th graders begin the program by enhancing their keyboard/piano skills in Digital Keyboarding. They also take Musicianship, a methods course where they learn to play woodwind, brass, string, *and* percussion instruments. The course ends with a special project in music technology.
- In 10th grade, students take a rigorous AP Music Theory course and may earn college credit. They study college-level music theory, which includes harmonic analysis, counterpoint, voice leading and ear training. An exhibition of students' digital compositions is also part of the curriculum.
- In 11th 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 twentiethcentury music. They also take Conducting where they acquire techniques needed to lead and direct ensembles. The AVPA-M program ensures a rounded arts education with part 1 of Music & Society: a course that teaches the evolution of musical style with corresponding art and socio-political trends. The year ends with Digital Recording Lab where students learn how to make professional-quality recordings of themselves and their peers while exploring music production.
- In 12th grade, Seniors learn current technological and composition techniques in Electronic Music Synthesis where they work with state-of-the-art software, such as *Finale*. The course culminates with each student completing a formal composition. They also complete part 2 of Music & Society. The 12th grade capstone course is Senior Music Seminar, where they each build a guitar, and take it home at the end of the course! As part of the course, seniors also produce and present their AVPA-Music Senior Recital- a state-mandated graduation requirement assessed by professionals in the music field.

Each AVPA-M student is required to participate in performing music electives each year (band, orchestra, choir, ensemble).

You can learn more about the AVPA-Music program by attending one of our concerts or admissions open house in the fall. Please note that the AVPA-M program is not a conservatory or a full-time performing arts program. We offer a college preparatory, academic honors program, with a focus in music. We offer a college preparatory, academic honors program, with a focus in music. Please note that the AVPA-M program is not a conservatory or a full-time performing arts program.

The music program at BCA includes over 15 electives with a variety of programs and partnerships: Chamber Music Society of Lincoln Center, performances for the greater Bergen County community, Songwriting contest, Ensemble Prestige, Tri-M Music Honor Society, honors ensembles (county, state, national).

What kind of student do you accept into the AVPA-Music Program? Academically talented students prepared for a challenging, college preparatory honors-level, academic curriculum. Students who have an outstanding ability in music- students we accept are some of the strongest musicians in their communities and participate in honors level ensemble and/or pre-college programs.

- Individuals who have demonstrated academic achievement
- Talented musicians who have achieved musical excellence (competition finalists, pre-college, awards, etc.)
- Students planning to study music in college.
- "Music is my life"
- Students with years of private music study continuing throughout high school.

What kind of student do you produce? College bound students prepared to succeed in college music programs. BCA graduates have gone on to study music at Berklee College of Music, Curtis Institute of Music, Eastman School of Music, Juilliard, Peabody Conservatory and Westminster Choir College. Many of our alumni are now touring musicians, music teachers, music business professionals, or avocational musicians working in other fields.



AVPA ACADEMY FOR VISUAL AND PERFORMING ARTS

AVPA offers three areas of concentration: Music, Theatre Arts, and Visual Arts.

What is the AVPA-Theatre Program? 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 the entertainment industry.

Core courses include sequences in acting, dance, voice and speech, musical theatre, theatre history, theatrical design, dramatic writing, and directing. In addition to studying with faculty members (all of whom have professional training and experience) AVPA theatre students work with outside industry professionals in every aspect of classwork and production. In addition to their coursework, students are required to participate, as performers and technicians, in at least two after school major theatrical productions over their time at BCA.

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 (Viewpoints, Stanislavsky technique, monologue, and classical work), encouraging them to learn to work in ways most productive for their individual growth.

- **In 9th grade,** students take Acting I and Voice and Speech I, focusing on self in order to release and open emotional, vocal, and physical ranges. Dance I focuses on ballet and tap and a special project on musical theatre performance introduces students to working as an ensemble as they approach material written for the musical theatre.
- In 10th grade, students in Acting II/Playwriting focuses on scene study from modern American realism and students utilize their understanding of structure learned in Theatre History I (late 19th Century writers through contemporary theatre) to write their own plays. Dance II furthers students' skills in ballet and introduces Musical Theatre dance.
- In 11th grade, students are challenged in Acting III with more advanced work by approaching monologue and solo work in addition to classical texts which are studied in Theatre History II, including investigations into the work of Shakespeare and the Greeks. Dance III allows students to continue progress at their own individual abilities in ballet and Musical Theatre dance. Juniors additionally have their Junior Seminar/Business of Theatre project which focuses on preparing for their college search as well as the variety of artsrelated careers they may want to pursue.
- In 12th grade, students work in Acting IV, an advanced scene study class, on the exploration of the text and utilization of technique to determine actor choices for the particular stylistic demands of a text and its period. Directing allows for a culmination of all the skills learned as students direct a fully staged and produced one-act play. Dance IV introduces modern dance to the skills already acquired from previous years and culminates in a group choreography presentation.

Every student is strongly encouraged to participate in theatre electives and projects each year (stage combat, stage makeup, costume design, stagecraft, stage management, screenwriting, and ballroom dance to name a few).

What kind of student do you accept into the AVPA-Theatre Program? The ideal candidate for AVPA/T will possess a combination of the following:

- Strong interest in pursuing an innovative academic experience alongside a deep interest in one or more of the theatre arts (acting, dance, musical theatre, playwriting, film, design, technical theatre)
- Self-discipline to maintain theatre studies and attend rehearsals after school while also keeping up with challenging academic coursework
- Eagerness to grow as a performing artist and willingness to accept constructive criticism with grace and enthusiasm
- Delight in the spirit of play and a strong passion for working with others to create a theatre family and ensemble rather than simply being the star in the spotlight

What kind of student do you produce? Theatre concentration students will be prepared to audition for college and conservatory Theatre Arts programs (BA and BFA). More importantly, 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. AVPA theatre alumni work in the entertainment field, on Broadway and in TV, film, and other media, as well as other fields such as medicine, science, law, business and politics. Moreover, they have enhanced and developed imaginative capacity, flexible ways of thinking, selfdiscipline, sophisticated presentation techniques, and superior collaboration skills.



AVPA

ACADEMY FOR VISUAL AND PERFORMING ARTS

AVPA offers three areas of concentration: Music, Theatre Arts, and Visual Arts.



What is the AVPA-Visual Program?

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. Twice a year, students prepare an exhibition at the school to showcase their works, and over the course of each year, student works are entered in competitions with very good results.

- **9th graders** begin the program by developing and enhancing compositional design skills using both traditional and digital tools. Students become acclimated to the Adobe software suite using PhotoShop, InDesign, and Illustrator. They work on bringing their drawing skills to a more mature level. The students also learn traditional and digital printing processes.
- In 10th grade, students study color theory and its application in real-world scenarios. They use digital cameras to learn how professional photographers deal with issues on the job. Students are introduced to the video production process and through this work, produce documentaries for an international competition. They also learn about virtual reality and use a 3D sculpting application to produce a completed model that they then 3D print. Students study html and css to develop their own websites. Students use their design skills to produce individual entries for a national design competition. They are also introduced to laser engraving and cutting.
- In 11th grade, students continue to develop their video production skills through the production of movie trailers that are based on the movie posters they created during sophomore year. They also continue their work with virtual reality, 3D modeling, Arduino, and web development technologies using UX/UI concepts, CSS, and scripting. Students will be introduced to the business aspect of art and will research the requirements and costs of creating and selling works. They will use their design skills to produce individual entries for a national design competition. Students will also work with hand tools, power tools, wire, mesh, and discarded electronics to produce sculptures.

• In 12th grade, students work on capstone projects that incorporate skills acquired over the previous three years, focusing on portfolio development and studio projects using traditional media as well as the Adobe Suite and other software. Course content includes portfolio assessment, interview techniques, and presentation skills. Students will also produce poster submissions for the annual SIGGRAPH Poster Competition.

Starting in the 10th grade, students may take AP Art course electives and may earn college credit. Every AVPA-V student is strongly encouraged to participate in visual electives each year (interactive design, screen process, digital photography to name a few). For a more complete description of all of the courses, please visit https://bcts.bergen.org/index.php/avpavisualcoursework.

We offer a college preparatory, academic honors program, with a focus in visual arts. Please note that the AVPA-V program is not an atelier or a full-time visual arts program.

What kind of student do you accept into the AVPA-Visual

Program? Academically talented students prepared for a college preparatory honors-level, academic curriculum. Accepted students are sometimes the strongest artists in their communities and participate in gallery/show events and/ or pre-college programs. Student we accept do not necessarily have the background but have the desire and motivation. We also look for:

- Individuals who have demonstrated academic achievement
- Students planning to study visual/industrial/design arts in college.
- "Visual is my life"
- Often times, students with years of private study continuing throughout high school.

What kind of student do you produce? College bound students prepared to succeed in college visual/industrial design, gaming, computer science, and engineering programs. Graduates have gone on to study music at The Cooper Union, The School of Visual Arts (SVA), Pratt Institute, Rhode Island School of

Design, and Savannah College of Art and Design, to name a few. Many of our alumni are now successful 2D and 3D digital and traditional artists, designers, publishers, game developers, or a vocational artists working in other fields.



A DAY IN THE LIFE OF AN ACADEMY STUDENT

A typical school day starts at 8:00 a.m. One big difference between the Academies and other schools is the length of the school day. School ends at 4:10 p.m., but if you choose to participate in a sport, the day may end even later.

BCA classes are divided into periods, that are approximately 50 minutes long. Each day's schedule is different: Monday schedules are similar to Thursdays and Tuesdays are similar to Fridays. Wednesdays are unique. Sophomore and Junior students take 2-period classes called Projects, while Seniors have allday internships. Each student has a certain amount of study halls where they may do their homework.

During Guidance Seminar, students meet with their counselors in groups to discuss topics of interest including school culture, personal growth and development. Please see the School and College Counseling section of this booklet for more information.

The last hour of the day is dedicated to

A SAMPLING OF ACADEMY ELECTIVES AND PROJECTS

For a complete listing of current electives, please visit our web site: http://bcts.bergen.org

Adv. Musical Theatre Adventure of English Aerospace Engineering American Cuisine Arduino Programming Art & Politics Chem Olympics Chinese History through Movies Combinatorics and Geometry Comedy Project Concert Band Concert Choir Criminology Develop Digital Journalism Digital Recording Lab Entrepreneur BCA Mart Entrepreneurial Science **Experimental Psych** Exploring American Regional Cuisine Exploring the Plant Kingdom Family Sci Day Kitchen Chem MAKE Mini Medical School Modern Board Games Physics Contests Playwriting I Sculpture - Masks Shakespeare Project Stage Combat/Stage Make Up Sustainability - Agriculture Plant Propagation

Theremin Veganism Voices Yearbook Creative Arts Workshop Acting Methods Advanced Skills for AP Biology Agricultural Research Methods Arabic Culture Artificial Intelligence I Astronomy Baking for the Holidays Ballroom Dancing Beginning Ballroom Biochemistry **Bio-Engineering** Bioethics Biopsychology Chinese Calligraphy Civ Eng_Architecture Civil Engineering Classical French Cuisine Comic Book Publishing Computer Security I Concert Choir Cooking for College Costume Design Creative Art Workshop Creative Nonfiction: Memoir, Personal Essay, and the Not-Quite-But-Almost College Essay Creative Puzzle Solving

Creative Writing Culinary Design Design for 3D Printing Design for Laser Cutting Designing Escape Rooms Developmental Biology Digital Imaging Digital Photography Earthquakes Einstein Relativity Fashion & Sewing Foundations of Nanotechnology Great Problems in Philosophy Guitar Class Immunology Interactive Design I/II/II Intermediate JAVA Intro Architecture Intro to 3D Printing (S) Intro to JAVA Intro to Journalism Intro to Laser Cutting (S) Intro to Linguistics Intro to Mandarin I, II, III Intro to Microscopy Intro to Microscopy Advanced Skills for AP Biology/Strategies for AP Biology Intro to Python Intro to Video Production Intro to Web App Development Intro Video I/II/III Introduction to Robotics Introduction to Volcanology

Latin Styles Marine Biology Marketing Markets & Trading Math Problem Solving Seminar MediBotics Model UN Modern Russian History I MRL Xploration Music & Society Non-Fiction Writing One Act Plays Orchestra Organic Chem I Paper Art Philosophy of Human Experience Post-Soviet Russia and the Near Abroad Psychology of the Individual Res App in Mol Biol and Genetics Research in Cell Biology Research in Cell Biology and Medical Science Screen Process Screenwriting Selected Topics in Pharmacology Sequential Art Sports Medicine Stagecraft Terrorism and 911 World Cuisine Writing for Science Competitions Yearbook Yoga

Period	Monday	Tuesday	Wednesday	Thursday	Friday
1	Physics	Physics	Physics	Physics	Study Hall
2	Spanish II	Spanish II	Guidance Seminar	Spanish II	Spanish II
3	Amer. Lit I	Amer. Lit I	Study Hall	Amer. Lit I	Amer. Lit I
4	Lunch	Lunch	Lunch	Lunch	Lunch
5	World History I	World History I	World History I	World History I	World History I
6	Math Analysis I	Math Analysis I	Math Analysis I	Math Analysis I	Math Analysis I
7	Marketing Management	Marketing Management	Study Hall	Marketing Management	Marketing Management
8	PE	Art Fundamentals	PE	PE	Art Fundamentals
9	Elective or Sports	Elective or Sports	Clubs or Sports	Elective or Sports	Elective or Sports

A typical schedule of a ninth grader

electives, or on Wednesdays	, clubs. Students may	participate in a sport ins	tead of taking an elective.

Teaching Pedagogy

CLUBS AND ACTIVITIES

Extracurricular activities at BCA are just as numerous, diverse, and exciting as our courses. Visit our website to see a complete listing of the clubs and activities offered to our students.

A sampling of extracurriculars includes...



Wind Chimes Project: Students employed scale ratios (math and physics) to measure and tune their chimes to a precise pitch, creating a custom tuned scale. In the visual arts area of design and proportion, they came up with their own wooden support, striker, and wind sail; usually from planks of wood, which are cut, fine shaped and sealed with marine grade varnish. Sometimes, students used shells or sea glass. In those cases, we used diamond coated micro drill bits (1-2 mm) to prepare the material for stringing. This is a fun project where everyone gets to experience a practical hands-on project and take something home that they will enjoy for years to come!

Musician's Workshop: Students in Musician's Workshop build authentic musical instruments or electro-music devices. Steps include everything from cutting wood to soldering electronics. Projects may include building a guitar or ukulele, or learning to solder electronic devices such as a digital drum machine, mini amplifier or Theremin.

LITMAG: The goal is to collect BCA student submissions of art, poetry, writing, photography as well as other forms of media and edit, design, and publish them into literary and art magazines to showcase the talents of the BCA community to the world. Additionally, the club seeks to teach its members valuable skills in editing, design, publishing, communication, and leadership.

3D Printing Club/ Makerspace: This club is meant to provide students with the opportunity to learn about 3D Printing and have time to work on their own personal projects or get involved in school-wide projects. Students in this club will become experienced with CAD and the entire 3D printing process.

Criminology: We will explore different aspects of crime including the causes and effects, prevention, and investigation. Our goal is to learn about criminology and crime investigation through hands-on experience and collaboration.

Logical Puzzle Solving: From having a "Eureka!" moment of finding the right number that fits in a Sudoku box, to solving puzzles using existing algorithms, the logic puzzle club's goal and main purpose is to share this joy of solving logic puzzles with the BCA community; in order to do so, the club will expose and let members play and discuss strategies for various logic problems such as Google's minesweeper game, Sudoku, Kakuro, KenKen, and more.

World Summit AI Americas, Montreal, Canada April 2024

The first-ever Global Studies program geared exclusively for the Academy for Technology and Computer Science travelled to Montreal for the conference. Students were able to immerse themselves in cutting edge research at some of the top CS universities in the world, interact with corporations and learn about innovative projects in the tech space, while exploring one of the most international and innovative cities in the world.

Companies such as Google, IBM and DeepMind have regional offices in the city.



Testimonial from one of our attending students:

The most unique aspect of the AI summit was being able to network with people from across the globe. While school provides an environment with many driven people, we often don't get that connection to more experienced and varied backgrounds. For two days, we were given the opportunity to have our finger on the pulse of the artificial intelligence industry, ranging from start-ups to some of the largest companies in the world. We were not only able to learn how AI is being implemented in the real world through listening to speakers, but also hear personal stories from these professionals on how they got started in their career. I personally made so many LinkedIn connections with people I met at the conference, which will be valuable when I need advice regarding AI research, or even seeking internships.

-IT, Class of 2025

RESEARCH

The unique research program at BCA, open to students from all academies, gives our aspiring students the opportunity to develop a research project based on their personal interests. Students at other high schools may have the opportunity to do research internships at cooperating professional labs, only students at our school have access to the latest scientific equipment to pursue their research interests internally, adjusted to their individual schedules.

Laboratory of Cell Biology: The students carrying out research in the Laboratory of Cell Biology are engaged in some unique endeavors using the state-of-the-art equipment found on our campus. Students in the Cell Biology Lab originate and investigate their own scientific questions that often focus on elucidating the biochemical and molecular underpinnings of various disease states using in vitro methods. In addition, students may also pose environmental questions, as well as questions related to developmental biology. Students have received high recognition from nearly every prestigious high school competition and have published their findings in peer reviewed journals. The Cell Bio Lab is also home to the BCA chapter of the Future Health Professionals. In addition, because of their passion for STEM and their desire to give back, these students facilitate the Bergen SciChallenge Middle School Science Fair affiliated with the Thermo Fisher Scientific Junior Innovators Challenge and the Society for Science and the Public.



"The Cell and Molecular Biology (CMB) Lab at BCA offers immense unique opportunities that are typically only found in graduate programs. The ability to carry out sophisticated assays allows me to fully explore my curiosities - all of which are supported by the teachers, research mentors, and ample resources. Through my journey with the CMB Lab, I have been able to foster an appreciation and love for biology research, for which I'm more grateful for than words could express." -Ria

Ria was recently awarded First Place in Biomedical and Health Sciences at ISEF 2024 and was also awarded the Dudley R. Herschbach SIYSS Award which includes an all-expense paid trip to attend the 2024 Stockholm International Youth Science Seminar during Nobel Week in Stockholm, Sweden. **Cancer Biology Research Laboratory:** This laboratory is extremely well equipped. An array of state-of-the-art instrumentation is available to students. Students are encoura ged to develop research projects based on their own interests and to develop the habit of selecting important scientific questions to answer. The main goal of the Cancer Biology Lab is to teach students to think deeply about science and understand how to apply the scientific method in a high-level manner. A critical question we attempt to answer in the Cancer Biology Lab is "What can I do if I develop an idea or make a discovery that has the potential to become a product?" Students in this program have also created a virtual biotech/pharmaceutical company and they get to interact with professional scientists, engineers, and government officials. This has given our students access to instrumentation and collaborations that have resulted in patent applications and the creation of new businesses.

Agriscience: This area of research utilizes the newly renovated environmental science center and greenhouse. Students from all Academies conduct research on the multifaceted discipline of agricultural science. Plants, animals, environmental resources, power and transportation, food science, and sustainability are areas for research within this broad discipline. Newly installed Coral Reef tanks allow for the additional area of marine science research.

All agriscience researchers become members of the student organization BCA Future Farmers of America and participate in competitive science fairs and national and international symposia at the culmination of their projects. In the short five years since its inception, BCA FFA students have won awards at both the NJ State and National FFA Agriscience Fair, the YSAP science fair, the Jersey Shore Junior Science Symposium, and our own BCA Research Expo (ISEF-affiliated).

Nano-Structural Imaging Lab: The mission of NSIL Biological Research is to introduce students to scientific inquiry, through research and instrumentation, and to provide transferable, handson experiences with the techniques, practices and perspectives of professional scientists; with an emphasis on microscopy as an analytical technique, especially electron microscopy. Students are eligible to participate in this program after completing one of the pre-requisite courses. Next, the student will develop a novel research project based on their own interests and current scientific literature, in cell biology, molecular biology, structural biology, biomedical research, or related fields. They will then learn the tools and techniques to carry out experiments on a topic of their choosing, acquire and analyze data, and present their results in written and oral form. Students have participated in the BCA Research Expo, Young Science Achievers Program, and Regeneron Science Talent Search, as well as publishing their findings in professional journals. Additionally, these students are well suited

RESEARCH cont'd

for careers in bio-imaging, histology, pathology, and other clinical research options.

Physics Research: Some of the research projects include: •Measurement of thermal expansion coefficient using Laser interferometry •Writing a LabView program to analyze the FFT output of the optogalvanic spectroscopy signal in a CO2 enriched cell •Simulation of Quantum Tunneling of Water in Beryl Crystal using Octave •Set-up of the experimental system aimed at observing the doubleslit effect and quantum entanglement with single photons •Measurement of small-scale vibrations using Michelson interferometry •Generating the standard operation procedures for Glucose sensing via mid-IR Spectroscopy.



"I have been conducting research on Mechanical Metamaterials since my Sophomore year. I started my project under the supervision of Dr. Kim, and I am currently working with Dr. Dogru. Metamaterials are fascinating structures, because they are artificially designed to exhibit properties and functionalities not found in nature. With the potential to revolutionize various fields, metamaterials have applications ranging from soft robotics to developing invisibility cloaks! In this project, I constructed metamaterials using various fabrication methods, performed experiments on them, and conducted a computational analysis to further study how the geometry of my prototypes affected their properties." -Belen

Belen had the honor of presenting her research at Regeneron ISEF 2024, the world's largest global science competition for high school students. There, she won both a Grand Award in Physics and Astronomy and a Special Award. She also presented her research at the 69th Annual New Jersey Academy of Science Meeting, where she won a First Place Prize in Physics.

Chemistry: Student researchers are encouraged to conduct hands-on lab experiments to synthesize, manipulate, analyze and visualize chemical species at nanoscale with the help of the stateof-the-art equipment for interdisciplinary applications. Chemistry research projects may incorporate the utilization of Atomic force microscopy (AFM), Fluorescent spectroscopy, Fourier transform infrared spectrophotometry, Four-point probe, Optical 3D Profiler, Optical tensiometer, Oxygen and water-free environment Glove Box, Rheometer and/or UV/Vis-NIR spectrophotometry.

Students may submit grant proposals for external funding, i.e. New York Institute of Technology Mini Grant and compete in various science competitions such as Regeneron Science Talent Search, Junior Science and Humanities Symposium, New Jersey Academy of Science Junior Fair and BCA Research Expo.

Math Research: This year two BCA students advanced on to the Olympiad round of the Mathematical Association of America's competition series, the American Invitational Mathematics Examination. One student qualified for the USA Junior Mathematical Olympiad, a competition for those in grades 10 and below meant to help train future Olympiad contenders. A student earned recognition at Harvard MIT Math Tournament tying for 5th place in the Combinatorics round and the 6th place in the overall Individual standings. The Math Team placed in the top 20 of the Team Round and finished in 30th place.



Students sharing ideas at the BCA Research Expo

THE ACADEMY RESEARCH MISSION

http://research.bergen.org/



The mission of BCA Research is to expose students to scientific inquiry, research and instrumentation, and to provide transferable, first-hand experiences with the techniques, practices and perspectives of professional scientists. By expanding the capabilities and context of secondary science education, we believe that students will be better equipped for, and more likely to pursue leadership positions in science, scientific research and global-scale problem solving. The foundations of the research program at BCA are deeply rooted in providing a real-world research environment for students to develop the independence, accountability, vision and drive to become outstanding members and future leaders within the science community. Our research program is based on six foundational principles, which work in concert with one another, to lay the groundwork necessary to nurture and challenge students to strive for excellence.



Perspective can be thought of as the jumping off point between traditional classroom teaching and independent research.



Students conducting independent research come to understand the purpose of their research. When developing the project and determining necessary experiments, students must understand the purpose of performing each experiment.





The tools needed to carry out experimentation make up a portion of the students' resources in a research project. Understanding how to use an instrument and obtain data, as well as determining the best tool to use for an experiment are important skills that a student develops in the experimentation stage of a project.



Collaboration with other students is a necessary part of the independent research project. Students involved in research will collaborate in a peer to peer format, where students discuss topics, review others work, and provide feedback.



Proper analysis includes dissection and interpretation of the data, plotting data into easy to understand visual charts, determination of statistical significance, and differentiatie neuances between correlation and causation.



It is necessary for a student to share the findings in the same way that a professional would. Students must compile the findings of the study in the form of a written report, poster, oral presentation, or in some cases, a publication.

PROJECTS



During their first three years at the Academies, students will spend two hours every Wednesday working on an interdisciplinary project. Students will have the opportunity to choose a different project each trimester. Students can choose among many available teacher-designed projects. See sampling of projects on page 10.

SENIOR EXPERIENCE

The Academies focus on developing students' readiness for the workplace. To help students prepare for their professional futures, the Academies requires that each student in the 12th grade complete an internship program called "Senior Experience."

program.

Students look forward to Senior Experience as a true capstone of their time at the Academies.

Overview

Senior Experience is an interactive career-based learning partnership through which students increase, in depth and scope, their knowledge and abilities under the guidance of a mentor(s). The Senior Experience program is a graduation requirement for which students receive nine academic credits in their senior year at BCA for completion of an internship which must be related to the student's Academy focus area.

Seniors spend the full business day every Wednesday at one of over 150+ organizations in Northern NJ or New York City. Partner organizations include everything from hospitals to hotels, universities to theaters, and from startups to Fortune 500 companies. Students may either create their own new internship or search through our database of thousands of previous opportunities. The process begins in Junior year where students are taught resume and cover letter writing as well as interviewing skills in their Junior Seminar class and begin applying for positions in April of their junior year. A full time faculty member coordinates and oversees the internship



To learn more about Senior Experience, and see a partial list of worksite placements, visit our web site: http://bcts.bergen.org.

ALUMNI NETWORK AND ALUMNI CAREER DAY

The BCA Alumni network is expanding and getting more powerful each year as our distinguished alumni move and advance in their careers. More than ever, they want to give back to the current students at BCA. Alumni host current students for Senior Experience Internships, are members of our Advisory Boards, and guest speakers in classes. Alumni Career Day is our largest alumni event where over 100 alumni return to campus the day before Thanksgiving to present on their career journeys to underclassmen.

SCHOOL AND COLLEGE COUNSELING



Bergen County Academies is fortunate to attract students with a multitude of talents and interests. The School Counseling Department provides a safe, supportive and nurturing environment for students to learn and grow in an academically challenging institution. Our mission is to provide academic, social, career and emotional support at each grade

level in order for students to reach and surpass their individual potential. Partnering with teachers, administrators, parents, and community members, we provide the essential support that students require during their adolescent years.

Through a developmental school counseling program, our counselors work with students every step of the way throughout their high school career. The process begins first trimester of freshmen year with the seminar course "Freshmen Exploration for Social, Emotional and Academic Success." Knowing it can be difficult adjusting to the high school culture, this course enables students to become comfortable with their school counselors as well as peers while also exploring typical adolescent issues. Counselors also meet individually with freshman to assess and provide guidance with their transition. By providing freshmen with the necessary academic, social and emotional skills for personal growth and development, students begin to understand their role in creating a positive school climate and making informed choices.

During sophomore year, students again work hand in hand with their school counselors individually and in "Sophomore Seminar," a course which addresses important issues related to academic, career and college planning. At this time, counselors administer career inventories and discuss AP/ IB course selection, the value of enrolling in meaningful summer programs and activities, standardized testing options, and methods of finding colleges that will be a "good fit." This seminar is designed to reduce the stress and anxiety students often encounter as they move forward toward their postsecondary goals.

During sophomore and junior years, students have the opportunity to attend optional multi-day overnight college tours. Students visit college campuses where they attend information sessions with admissions staff and tour each school. By eating in college dining halls and attending evening activities, students acquire a first-hand feel for a school's environment. These tours allow students to sample a wide variety of colleges in the company of their peers while under the supervision of their school counselors.

As students enter junior year, the School Counseling Department recognizes that the college selection process and career readiness become a major focus. Understanding its importance, counselors work with students to ensure a smooth, confident approach for this sometimes daunting task. Junior Seminar not only provides students with college planning support but with the career tools and training (resume writing, cover letters and interview skills) essential for Senior Internship. Junior College Night is held every year in the winter of junior year for parents and students to understand the entirety of the college process. Immediately after this important night, counselors conduct college planning conferences with students and their families to demystify the college process, suggest appropriate collegiate prospects, and guide students through testing and application procedures. Each year, the School Counseling Department hosts numerous college visits, professional speakers, financial aid nights, and our annual spring college expo, which attracts approximately 100 prestigious college and universities.

As junior year comes to an end, students are invited to attend our annual College Exploration Experience (CEE), a three day, two-night program that serves as an intensive look at the college admission process. Students will attend seminars on topics such as How Colleges Select Students, How to Write Your College Essay, and The College Interview. They will be given a mentor who will meet with them in a small group or individual setting to answer questions, refine their essays, and help create a custom list of colleges to consider. Our mentors are both college admissions officers and experienced independent school counselors. They represent selective colleges and universities as well as some of the most prestigious independent schools in the country. While this program is not required, it is highly recommended by our School Counseling Department and previous attendees.

Fall of senior year is an especially busy time in the school counseling office. Counselors assist students with applications, essay critiques and college lists. Although applying to college can be a stressful time in a student's and family's life, counselors provide ongoing support and resources to navigate through these challenging times.

Throughout high school, our students utilize Naviance, an online career and college portal. This excellent tool allows students, parents and counselors to communicate about the college process, research what majors are offered at different colleges and maintain a working list of college prospects. With Naviance, the college process becomes far less daunting and students are able to truly assess which colleges are best for their personal goals and abilities. Parents are able to access Naviance as well, so that they can be fully involved and active in the college process.

Although a student's needs vary at each grade level, our commitment to each student's success remains the same. From encouraging students to reach out when they need a helping hand or supporting them through tough times, the School Counseling Department is committed to helping students reach and surpass their academic, social, and emotional potential.

SPORTS

Students at the Academies play on sports teams with students from Bergen County Technical Schools' Teterboro and Paramus campuses. Bergen Tech Athletics compete in the Big North conference and the NJTAC. Our teams compete at the varsity, junior varsity, and freshman levels.

At Bergen County Technical Schools, athletics are a vital part of our commitment to providing a well-rounded education. Our student-athletes have the opportunity to develop important life skills through their participation in interscholastic sports, including determination, perseverance, sportsmanship, communication, and teamwork.

We believe that athletics play an important role in promoting a positive self-concept and a healthy body. By participating in athletic competition, our students develop school spirit and pride in their school and community. Additionally, our student-athletes leave our athletic programs with the readiness to be active participants in today's global community.

At Bergen County Technical Schools, we strive to provide a wholesome form of physical activity for as many students as possible. We are committed to offering our student-athletes the best in equipment, facilities, and coaching to ensure an enjoyable and rewarding athletic experience.

We believe that the soul of our school can be reflected in what occurs before and after the normal academic day. This extension of the school day, whether it be in athletics, the arts, or clubs, sets the tone for the school year and helps to create a positive and inclusive school community. We are dedicated to creating a supportive and inclusive athletic community that welcomes athletes of all backgrounds and skill levels.

Our student-athletes compete in the Big North Conference and the NJTAC at the varsity, junior varsity, and freshman levels. We hold ourselves to the highest standards of sportsmanship and integrity and are strongly committed to the rules and regulations set forth by the NJSIAA and Big North Conference.

Bergen County Technical Schools is comprised of four campuses - Bergen County Academies (BCA), Teterboro, Paramus, and Applied Tech. We are proud to offer our studentathletes the opportunity to play under the banner of the Bergen Tech Knights, regardless of which campus they attend. Our student-athletes come from all four campuses and compete together in a spirit of unity and teamwork. This fosters a sense of community and inclusivity across our campuses and helps to build lasting friendships and bonds.

At Bergen County Technical High Schools, we understand the tremendous responsibility we have as coaches and administrators to the student-athletes in our care. We are committed to strengthening the bond of trust between parents, students, and our school community by providing a positive athletic experience.

SPORTS OFFERED

FALL

Football—Varsity, Sub-Varsity Boys/Girls Soccer—Varsity, Junior Varsity, and Freshman Boys/Girls Cross Country Girls Tennis—Varsity and Junior Varsity Girls Volleyball—Varsity, Junior Varsity, and Freshman Football Cheerleading

WINTER

Boys Basketball—Varsity, Junior Varsity, and Freshman Girls Basketball—Varsity and Junior Varsity Boys/Girls Bowling Boys/Girls Fencing Boys/Girls Indoor Track Competitive Cheerleading (tryouts are in the summer)

SPRING

Baseball—Varsity, Junior Varsity, and Freshman Softball—Varsity, Junior Varsity, and Freshman

Boys/Girls Golf Boys/Girls Lacrosse— Varsity and Junior Varsity Boys Tennis—Varsity and Junior Varsity Boys/Girls Track & Field Boys Volleyball— Varsity and Junior Varsity



2023-2024 ACCOLADES

Girls Volleyball – Big North Liberty Division Champions

- Boys Volleyball Big North Liberty Division Champions
- Girls Bowling Big North Liberty Division Champions, BCWCA Champions, Team Of The Year
- Boys Bowling NJSIAA Sectional Champions, Big North Liberty Division Champions, BCCA Champions, Team Of The Year

Girls Golf - Big North Liberty Champions

Girls Fencing – BPFL Patriot Division Champions

Boys Fencing – BPFL Patriot Division Champions, BCCA Champions

Girls Tennis – Big North Liberty Division Champions

Boys Tennis – Big North Liberty Division Champions, BCCA Champions













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