



Distinguished Pathways and Programs at the O’Bryant

The following pathways and programs are available to all students. Initial enrollment typically occurs at the beginning of a students’ first year of high school. While we highlight signature courses for each pathway and program, students must also meet all local and state requirements.

The AP Capstone Diploma Program

“AP Capstone™ is an innovative diploma program from the College Board that equips students with the independent research, collaborative teamwork, and communication skills that are increasingly valued by colleges. AP Capstone is built on the foundation of two AP courses — AP Seminar and AP Research — and is designed to complement and enhance the in-depth, discipline-specific study experienced in other AP courses.

In AP Seminar, students investigate real-world issues from multiple perspectives, gathering and analyzing information from various sources in order to develop credible and valid evidence-based arguments. In AP Research, students cultivate the skills and discipline necessary to conduct independent research in order to produce and defend a scholarly academic paper. Students who earn scores of 3 or higher in AP Seminar and AP Research and on four additional AP Exams of their choosing will receive the AP Capstone Diploma. Students who earn scores of 3 or higher in AP Seminar and AP Research but not on four additional AP Exams will receive the AP Seminar and Research Certificate, (College Board).” Students who enroll in AP Seminar are expected to also take AP Research during their senior year of high school.

Computer Science Pathway

The Computer Science Pathway offers students the opportunity to develop strong programming, design, and computational thinking skills. This program aligns with the Project Lead the Way (PLTW) computer science course curriculum and includes a sequence of computer science courses that students can complete during grades 9-12.

Students in the Computer Science Pathway will enroll in the Exploring Computer Science course during their freshman year and will develop skills using both block and text-based programming, create usable apps, create a website, explore computer science careers, and learn Python programming. Sophomore year students will enroll in the AP Computer Science Principles (CSP) course and delve more deeply into programming languages, computational thinking, and web development. The O’Bryant was awarded the College Board *2018 AP Computer Science Female Diversity Award* for our work in this program. During junior year, students will enroll in the Computer Science A course and engage in an in-depth study of Java programming, advanced Android app development, and game development.

In their final year of high school, students will complete a Cybersecurity course that provides students with exposure to digital and information security, while encouraging socially responsible choices and ethical behavior. It inspires algorithmic and computational thinking, especially “outside-the-box” thinking. Students will explore educational and career paths available to cybersecurity experts, as well as careers that comprise the field of information security. Students will study personal cybersecurity, system security, network security, and applied cybersecurity. The course aligns with the National Cybersecurity Workforce Framework developed by the National Institute of Standards and Technology (NIST). Signature Courses in the Computer Science Pathway include the following:

Grade 9	Grade 10	Grade 11	Grade 12
Exploring Computer Science	AP Computer Science Principles	AP Computer Science A (Java programming)	Cybersecurity

Engineering Pathway

The O'Bryant is currently the *only* school in BPS that has a supported and recognized engineering program. The Engineering Pathway is designed to deeply engage students in the engineering design process and to develop skills that prepare students for college study in engineering and the sciences.

Students in the Engineering Pathway will enroll in the Introduction to Engineering Design course during their freshman year. In this course, students will work on numerous collaborative projects and design and build several devices. Students will develop a comprehensive understanding of the engineering design process and develop skills in the areas of technical drawing, Computer-Aided Design (CAD), and 3D modeling. Students will also learn how to safely use hand and power tools and become adept at using 3D printers.

In their sophomore year, students will participate in the Principles of Engineering course. In this course, students will learn how to design, build, program and control various devices. Students will learn the basics of mechanical systems, energy and power systems, and control systems. Students will also study the properties of different materials and explore how various structures function. During their junior and senior years, students will have the opportunity to engage in additional engineering coursework and work on an independent or group Capstone Project. Students are also expected to take AP level math and science courses, as well as participate in engineering experiences and dual-enrollment opportunities with local universities. Signature Courses in the Engineering Pathway include the following:

Grade 9	Grade 10	Grade 11	Grade 12
Introduction to Engineering Design	Principles of Engineering	Aerospace	Engineering Development and Design

Health Science Pathway

The mission of the Health Science Pathway is to prepare students to pursue a college major and career in the field of health science. The program offers students a rigorous college preparatory curriculum that focuses on intense academic supports and enrichment opportunities.

Students enter the Health Science Pathway in grade 9 and enroll in a full-year Biomedical Science course where they learn about the human body systems and how these systems are integrated. They also learn about the pathophysiology of disease and the treatment of diseases using a project-based approach. Students will become proficient in the use of medical terminology, understand the Latin roots of medical terms, engage in medical research utilizing the scientific method, and participate in presentations using a public health lens. The Health Science Pathway partners with *Boston University Medical School, Harvard Medical School, and Dana Farber Cancer Institute, Brigham and Women's Hospital, and Beth Israel Hospital* to offer an extended day enrichment curriculum. These partner programs offer students increased exposure to the medical field and provide hands-on learning opportunities connecting the classroom curriculum to experiential learning in a laboratory setting. Medical students, graduate students in health-related fields, and college professors support this enrichment program.

Students take chemistry as their science course sophomore year, which prepares them for the rigor of AP Chemistry and AP Biology. Students will continue to participate in internship programs with our Longwood Medical Partners. These programs take place after school, on weekends, and during the summer. During the junior year, students can choose to take AP Chemistry or AP Biology. Senior year, students are expected to take a course in Anatomy and Physiology and are strongly encouraged to take statistics, AP Statistics, AP Biology, or AP Chemistry. Signature Courses in the Health Science Pathway include the following:

Grade 9	Grade 10	Grade 11	Grade 12
Biomedical Science <i>Case Studies</i>	Chemistry	AP Chemistry <i>or AP Biology</i>	Anatomy and Physiology, AP Biology <i>or</i> AP Chemistry