### DIRECTORY OF ADMINISTRATORS

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Valerie J. Reidy</td>
<td>Principal</td>
<td>135</td>
</tr>
</tbody>
</table>

### ASSISTANT PRINCIPALS ADMINISTRATION

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shun Fang Chang</td>
<td>Assistant Principal Pupil Personnel Services</td>
<td>035F</td>
</tr>
<tr>
<td>Stephen Kalin</td>
<td>Assistant Principal Management Information Systems</td>
<td>134</td>
</tr>
<tr>
<td>Phoebe Cooper</td>
<td>Business Manager</td>
<td>135</td>
</tr>
</tbody>
</table>

### DEPARTMENT SUPERVISORS

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>Room</th>
</tr>
</thead>
<tbody>
<tr>
<td>David Colchamiro</td>
<td>Assistant Principal Social Studies Department</td>
<td>307D</td>
</tr>
<tr>
<td>Jean Donahue</td>
<td>Assistant Principal Biological Science Department</td>
<td>329D</td>
</tr>
<tr>
<td>Damaris Fernandez</td>
<td>Assistant Principal English Department</td>
<td>207D</td>
</tr>
<tr>
<td>Annelisse Falzone</td>
<td>Assistant Principal Physical Science Department</td>
<td>231D</td>
</tr>
<tr>
<td>Fred Levy</td>
<td>Assistant Principal Technology, Music and Art Departments</td>
<td>315D</td>
</tr>
<tr>
<td>Michael Contente</td>
<td>Department Coordinator Mathematics Department</td>
<td>107D</td>
</tr>
<tr>
<td>Lisa Rocchio</td>
<td>Assistant Principal Foreign Language</td>
<td>214D</td>
</tr>
<tr>
<td>Arlene Taudel</td>
<td>Assistant Principal Physical Education Department</td>
<td>048D</td>
</tr>
</tbody>
</table>

The Bronx High School of Science reserves the right to withdraw any class or change the faculty who have taught the course in the past.
# Table of Contents

DIRECTORY OF ADMINISTRATORS ................................................................................. 3

THE ENGLISH DEPARTMENT ....................................................................................... 5

THE SOCIAL STUDIES DEPARTMENT ........................................................................ 11

THE MATHEMATICS DEPARTMENT ........................................................................... 19

THE BIOLOGICAL SCIENCE DEPARTMENT ............................................................... 24

THE PHYSICAL SCIENCE DEPARTMENT ................................................................. 31

THE FOREIGN LANGUAGE DEPARTMENT ............................................................... 38

TECHNOLOGY EDUCATION ...................................................................................... 43

VISUAL ARTS ............................................................................................................ 47

MUSIC ....................................................................................................................... 49

THE HEALTH AND PHYSICAL EDUCATION DEPARTMENT .................................. 51

GUIDANCE DEPARTMENT ......................................................................................... 52

GRADUATION REQUIREMENTS ............................................................................... 53

COURSE SELECTION INFORMATION ...................................................................... 54

PROGRAM PLANNING GUIDELINES ........................................................................ 55

GRADUATION PLANNING SHEET ........................................................................... 57

ON-LINE ELECTRONIC COURSE CATALOG ......................................................... 64
THE ENGLISH DEPARTMENT

FRESHMAN ENGLISH CLASSES

**E1 - Freshman English**
(5 periods per week for 1 year – Not a Special Permission Course)
This course focuses on literature that addresses social issues consistent with the theme of growing up and values. The class involves the study and analysis of novels, short stories, poetry, and plays. The first semester includes a strong emphasis on writing through the teaching of grammar, vocabulary and different types of essays.

SOPHOMORE ENGLISH CLASSES

**E3 – Sophomore English**
(5 periods per week for 1 year – Not a Special Permission Course)
This course focuses on classical works of literature. The class involves the study and analysis of novels, short stories, poetry, and plays that include Henry IV, The Odyssey, and A Tale of Two Cities. This class also involves various types of writing assignments based on each of the literary works studied during the year.

**E3FH – Forensics**
(5 periods per week for 1 year, Special Permission required)
This Sophomore English Honors course, in addition to following the Sophomore English curriculum, provides instruction in debate and public speaking. Students read Henry IV Part I, A Tale of Two Cities, The Merchant of Venice and The Odyssey. One fourth of the course will be devoted to speech and debate. Students learn how to deliver an original oratory and how to debate using logic, rhetorical language, and argumentation. Admission to this class requires good grades in Freshman English, a strong recommendation from your English teacher, and a writing sample. No previous experience in speech and debate is necessary or preferred.

**E3OH – Honors Sophomore English**
(5 periods per week for 1 year, Special Permission required)
This Sophomore English Honors course provides instruction from the Sophomore English curriculum. It includes the reading of classics of world literature such as The Odyssey, and A Tale of Two Cities. Enrichment activities include an emphasis on creative responses to these texts. Students will work collaboratively, as partners and as teams, on special projects during the year.

The Bronx High School of Science reserves the right to withdraw any class or change the faculty who have taught the course in the past.

- 5 -
JUNIOR ENGLISH CLASSES

E5 – SURVEY OF AMERICAN LITERATURE
(5 periods per week for 1 year – Not a Special Permission Course)
This course focuses upon masterpieces of American literature from pre-colonial times to the twentieth century. The class involves the study and analysis of novels, plays, poetry, short stories, and nonfiction works that reflect American society, its culture and values.

E5OH - ADVANCED ENGLISH
(5 periods per week for 1 year, Special Permission required)
This honors course is a study of the development of American literature. In addition to the regular junior English curriculum, this course includes training in critical reading and thinking, and emphasizes expository writing. Opportunities to do creative writing are also part of the course work.

E5CH - CREATIVE WRITING
(5 periods per week for 1 year, Special Permission required)
In addition to the regular year's curriculum in American literature, this course stresses the writing of original poetry, short stories, and plays. The best work of these classes is published in DYNAMO, the Bronx Science literary magazine. Good grades in English at our school and the strong support of your English teacher are required. Highly motivated students who are talented creative writers should apply.

E5JH - JUNIOR JOURNALISM
(5 periods per week for 1 year, Special Permission required)
In addition to exploring the regular American literature honors curriculum, this course, designed for students who like all kinds of writing, teaches news and editorial writing in hands-on journalism “workshop” sessions. Important issues in print journalism are explored through critical reading and consideration of The New York Times and other publications. In the spring semester, students will use the newsroom’s desktop publishing technology to write, edit articles, and design newspaper pages.
This honors course will help prepare students to assume editorial positions on Science Survey in the senior year, in conjunction with participation in EJ3V-Journalism Workshop (a sixth major course), which may be taken during the junior and senior years.

SENIOR ENGLISH

Seniors may take an Advanced Placement English OR a senior selective (not both).

ADVANCED PLACEMENT SENIOR ENGLISH

E7X1 – ADVANCED PLACEMENT LITERATURE
(5 periods per week for 1 year, Special Permission required)
This course is equivalent to a college level course. A high grade on the Advanced Placement Exam often entitles candidates to advanced standing in college. Students read intensively and write frequent critical analyses. Only the most talented students of proven ability in English are
accepted. Students in this class must take the Advanced Placement test in May. The State University at Albany accredits this course.

**E7X2 – ADVANCED PLACEMENT ENGLISH LANGUAGE AND COMPOSITION**

(5 periods per week for 1 year, Special Permission required)
This course stresses rhetoric, writing style, and linguistics, as well as literature. Only the most talented students of proven ability in English are accepted. Students in this class must take the Advanced Placement test in May.

NOTE:
STUDENTS WHO TAKE ADVANCED PLACEMENT COURSES ARE REQUIRED TO TAKE CORRESPONDING AP EXAMS IN MAY.
The ADVANCED PLACEMENT Exam Fee is $83 per exam.

**SENIOR SELECTIVES IN ENGLISH**

(some or all selectives may not be offered next year)

What is a Selective Course? Selective courses satisfy the senior English requirement but emphasize a particular aspect of the subject area. All selectives cover the same English 7 curriculum.

Every attempt is made to place students in the "selective" of their choice; however, due to scheduling limitations, it is sometimes necessary to place students in another selective course to allow for program limitations. Courses substituted for scheduling reasons will not be changed.

**E7 – A SURVEY OF ENGLISH AND WORLD LITERATURE OR REQUIRED SENIOR ENGLISH**

(5 periods per week for 1 year – - Not a Special Permission Course)
This course focuses upon masterpieces of English and world literature. It includes the study of novels, plays, poetry and short stories that are more global than American in scope. Students should expect to spend time studying vocabulary, writing compositions, and learning important concepts of written expression.

**E7L – “FROM A RIB OF ADAM” – WOMEN IN LITERATURE**

(5 periods per week for 1 year – - Not a Special Permission Course; this course may not be offered.)
Do you hold the Old Testament belief that Eve was created from a rib of Adam? The main thrust of this course will be that the role of women in this and other societies cannot be fully understood unless we explore the sex roles of both men and women. The cultural and societal expectations that shape our roles as men and women often trap us into behaviors and a status that seem sometimes to be beyond our control and definitely beyond our making. Join us in a search for what literature reveals the roles of men and women have been in the past and what they might become in the future. This course is open to serious students of literature who are interested in learning more about authors such as Strindberg, Sophocles, Kate Chopin, Ibsen, Morrison, Hong, and members of the Feminist Movement.
E7B – A STUDY IN EVIL
(5 periods per week for 1 year – - Not a Special Permission Course; this course may not be offered.)
This course will examine the question of what evil is, how it is manifested in society and in the individual, and how it has been portrayed in literature. Readings will explore the great literary villains, including Shakespeare’s Iago and Richard III, Marlowe’s Doctor Faustus, and Conrad’s Kurtz. In addition, contemporary authors will be examined in order to understand evil as it operates in the twentieth century.

E7M – LITERATURE AND FILM – Like Writing with Lightning*
(5 periods per week for 1 year - Not a Special Permission Course; this course may not be offered.)
Students read literary works from the senior curriculum (novels, plays, short stories, poems), and examine filmed versions of these stories. The course emphasizes writing about literary themes and styles, and studying how cinema attempts to convey these ideas. Films will not be screened in class; students are expected to view the videos on their own, or attend after-school screenings periodically. The course is intended for the student who is serious about writing about literature and film.

*A paraphrase of President Woodrow Wilson’s reaction after watching his first movie.

THE FOLLOWING COURSES MAY BE TAKEN AS 5th or 6th MAJORS:
These courses must be taken with an E5 or E7 class.

ELP1 – INNER VISIONS: POETRY AND THE CREATIVE PROCESS
(5 periods per week for 1 year – - Not a Special Permission Course)
This course is designed to explore the habits and skills of writing about and analyzing poetry which are critical for success on the college level. The study of composition will be emphasized. The course will begin with the study of poets by Renaissance poet Sir Philip Sidney, William Shakespeare and the invention of the sonnet and proceed through poets of the twentieth century. Students will be introduced to the poetic tradition primarily of English and American poets with occasional excursions into poetry in translation by poets such as Rilke, Neruda and Borges. The course will introduce students to literary theory, cultural history and literary criticism as they apply to poetry. In addition, the course will feature a creative writing component; students will have the opportunity to write poems of their own and to compose mimicry poems. This course is designed to increase each student’s appreciation of poetry through exposure to Canonical poets, and to strengthen critical skills necessary to understand and evaluate poetry on the college level.

ELS1 - SHAKESPEARE BEHIND THE SCENES
(5 periods per week for 1 year – - Not a Special Permission Course )
This is a course where your labors of love will not be lost, and measure for measure we will play it as you like it, even if we stir up a tempest or two or make much ado about nothing. All’s well that ends well, and in this course students will explore the histories, tragedies, and comedies of Shakespeare. The plays will be read, discussed, enjoyed, and written about in depth. Shakespeare’s times, his own life, and the development of theatre will be studied. The important critical commentaries of Shakespeare will be read, including A.C. Bradley and Marchette Chute. The purpose of the course is twofold: to increase our understanding of the breadth and influence of Shakespeare’s thoughts and works and to learn the method of research, textual analysis, and writing critical essays. Students will be guided in independent
research and projects. Renaissance and Shakespearean themes, including love, fortune, immortality, youth, passion, and the fool will be explored. Important filmed and taped performances will be viewed, and live performances visited. Guest lecturers will be invited to class and resources of area colleges will be made available. Selected Shakespearean Sonnets will be read and analyzed. Among the plays studied are *The Tempest, Richard II and III, Hamlet, Othello, King Lear, Taming of the Shrew*, and *Anthony and Cleopatra*. A love of literary exploration and interest in the process of discovering new connections are necessary for success in this course.

**SIXTH MAJORS IN ENGLISH**

**SIXTH MAJORS** in English are specially designed workshop courses. Students who wish to take a sixth major in ENGLISH must also take a regular English class.

**EC1* – Bronx Science Forensics Debate Team**  
(5 periods per week for 1 year - Special Permission Required - 6th major only)  
This leadership course is open to officers of the Bronx Science Forensics Team. The focus of this class is to develop leadership skills which will allow the student officers to fulfill the responsibilities required for managing a “World-Class” Speech and Debate Team. Class time will be used for the head coaches and officers to discuss and review Policy and Lincoln-Douglas debate strategies as well as Individual Events techniques.

**EC3* – Public Speaking Class**  
(5 periods per week for 1 year - 6th major only; this course may not be offered.)  
The fall semester focuses in the development of skills in various types of public speaking such as original oratory, extemporaneous, informative, and persuasive speaking. In the spring semester students learn techniques of argumentation and debate. After mini-debate exercises all students participate in individual and team debates. The course culminates in a sixteen-team debate tournament.

**EP1* – BASIC ACTING – IMPROVISATION AND PERFORMANCE**  
(5 periods per week for 1 year - Not a Special Permission Course – 6th major only)  
This course is an introduction to acting techniques, staging, and performance. The course begins with theater games and exercises, followed by work on improvisation, which will include evolving student-generated ideas. Students will be encouraged to develop their acting skills through techniques stressing relaxation, focus, sensory recall, mime, and improvisation. Scene study from professional plays will be included, as well as elements of Readers’ Theatre. The basics of stage makeup will be demonstrated.

**EP3* – ADVANCED ACTING: PLAY PRODUCTION**  
(5 periods per week for 1 year - Special Permission Required – 6th major only)  
Do you have a yearning to be a star? Although we can’t guarantee Broadway, this class may be for you. Students rehearse, stage, and perform a full-length drama. They also write, rehearse, and direct original one-act plays. Successful completion of Basic Acting (EPT1) is a requirement for admission. Admission by audition only.
**EJ3* - JOURNALISM WORKSHOP**  
(5 periods per week for 1 year – Special Permission Required – 6th major only)  
This leadership format class is open to juniors and seniors who will be responsible for the editing, proofreading, layout, and production of the school newspaper, *Science Survey*. The workshop will be conducted in a "newsroom" setting in which students will become proficient in the use of computers for newspaper writing. They also will have an opportunity to learn desktop publishing. The class is open to juniors and seniors interested in experiencing the demanding "real" world of writing and editing for deadlines; learning and administering the business management of a school newspaper; and being responsible for all aspects of art, photography, layout and newspaper production.

All *Survey* editors will be required to take this course. However, it is also open to other juniors and seniors who wish to occupy positions of leadership and serious responsibility on the school newspaper. Students taking E5JH – Junior Journalism are especially encouraged to take this course in the junior year.

**EJ1* - YEARBOOK WORKSHOP**  
(10 periods per week for 1 year – Special Permission Required – 6th major only)  
This is a sixth major for juniors and seniors who would like to learn how to produce an award-winning publication, the *Observatory*. Students will develop marketable skills in design and layout, writing, editing, proofreading, photography, management, and advertising. Students must exhibit creativity, organization, responsibility, and have skills in photography and writing. It is helpful, but not required, for students to have their own camera (either digital, or Single Lens Reflex cameras (not point and shoot)). All participants will be expected to work outside of class and to meet after school during certain times of the year. In addition to the individual responsibilities, all participants have a duty to the entire student body and to the school to produce a yearbook of the highest quality. The yearbook workshop is a very rewarding experience for students who are willing to work hard. Interested applicants should contact the Assistant Principal of the English Department (Room 207D). Staff training for the next school year’s publication (for students who are selected as editors) begins during the last week of school with a journalism workshop at Columbia University. Students are especially encouraged to join the yearbook staff during their junior year, as they are most likely to receive leadership positions during the senior year.
THE SOCIAL STUDIES DEPARTMENT

As historians Irwin Unger and Robert R. Tomes have stated; “Americans worry about the state of education in the United States today. Recently we have been told how little students know about science, geography, mathematics, and history; we fear that our country will be unprepared to compete against the other advanced industrial societies in years to come. We are also concerned that the new generation will lack the shared civic knowledge essential for a functioning democratic system.

There is indeed reason to be dismayed by how small a stock of historical information young Americans possess. But it is important also to realize that education is not just transmission of data. It is also the fostering of critical thinking. The most encyclopedic knowledge does students little good if they cannot use it to reach valid and useful conclusion.”

It is this belief that has inspired the Social Studies Department of The Bronx High School of Science to develop courses and techniques that stimulate active and analytical learning about a great variety of subjects that encompass the social sciences. The following pages, which describe this department’s elective and required offerings, are dedicated to achieving the goals expressed above.

FRESHMEN SOCIAL STUDIES COURSES
OPEN TO INCOMING FRESHMEN

H1$ WORLD HISTORY
(5 periods per week for 1 year – Not a Special Permission Course)
This course is the first of a 2-year sequence that satisfies the New York State Global Studies requirement. The course covers world history from pre-historic times to 1789.

Or

H1X ADVANCED PLACEMENT WORLD HISTORY
(5 periods per week for 1 year – Not a Special Permission Course)
This is the first of a 2-year sequence that culminates in the taking of the Advanced Placement World History exam and fulfills the New York State Regents requirement in Global Studies. It is open to highly motivated students with a strong interest in history and demonstrated superior writing and research skills. Students are expected to handle college level texts and primary sources.

SOPHOMORE SOCIAL STUDIES COURSES

H3$ – GLOBAL HISTORY 3
(5 periods per week for 1 year – Not a Special Permission Course)
This course covers world history from 1770 to contemporary times. Some of the topics included in the first term are the revolutions of the early nineteenth century, the failure of democracy in the search for stability, economic and social changes, nationalism, imperialism, World War I, and the Russian revolution. Issues covered in the second term include fascism, World War II, the Cold War, Post- World War II economics, the Chinese Communist Revolution, Post- World
War II Africa, Post WWII South East Asia, Post- WWI Latin America, and the collapse of communism and the break-up of the Soviet Union.

H3X – ADVANCED PLACEMENT EUROPEAN HISTORY
(7 periods per week for 1 year - Special Permission Required).
The sophomore course will cover the period from 1400 to the contemporary times. It replaces Global Studies 3-4 and uses a high level textbook and supplementary reading material. There will be supplementary primary and interpretive readings. The class will be conducted primarily in discussion fashion but may include lectures, panel discussions, and debate. Considerable attention will be paid to developing writing and interpretive skills for test essays and for research. There is a research requirement. In addition to taking the Global Studies Regents, students enrolled in this class must take the Advanced Placement exam in May.

H3X3 – ADVANCED PLACEMENT WORLD HISTORY – YEAR 2
(5 periods per week for 1 year)
This is the continuation of the two-year Advanced Placement World History (H1X) course. All freshmen currently in Advanced Placement World History must take the second year of the course. No other students may enroll in this course.

JUNIOR SOCIAL STUDIES COURSES
Students may take any of the following classes to satisfy their Junior Social Studies requirement:
• Regular U.S. History and Government
• Two Year Advanced Placement U.S. History for juniors
• One Year Advanced Placement U.S. History for juniors
• Mock Trial

H5 - U.S. HISTORY AND GOVERNMENT
(5 periods per week for 1 year – Not a Special Permission Course)
This course begins with the American Revolution and ends with contemporary times. The study of the function of American Government is emphasized throughout the year.

H5OT MOCK TRIAL - UNITED STATES HISTORY & GOVERNMENT
(5 periods per week for 1 year - Special Permission Required).
Do you enjoy courtroom drama on television and in the movies? Can you picture yourself as a witness or as a lawyer performing in a courtroom trial? This course combines the traditional H5 curriculum with material and skills needed to conduct a court case. Juniors may take this course in lieu of the traditional United States History and Government course. In Mock Trial, students will prepare for the United States History and Government Regents by studying concepts such as separation of powers, checks and balances, the elastic clause, judicial review along with the personalities that shaped our history such as Thomas Jefferson, Alexander Hamilton, Andrew Jackson, and Theodore Roosevelt.
With the assistance of an attorney from the law firm of Akin, Gump, Strauss, Hauer, and Feld, students will learn how to make opening and closing statements, raise objections, and how to conduct direct and cross examinations. Students will gain a wealth of educational advantages, from learning how to read complex materials to experience in developing analytical abilities and making public presentations. The course will demystify and humanize the legal system through interaction with attorneys, visits to law firms and courtrooms, and participation in the New York State Mock Trial Competition.

The centerpiece of Mock Trial will be the participation of twelve students from the class in the New York State Mock Trial Competition. Team members will travel by subway to law firms to practice. The actual rounds of competition will be held at the U.S. Federal Courthouse, 500 Pearl Street in Manhattan. A student who recently took the course stated: “I just want you to know that I found Mock Trial to be an amazing experience. I have never been part of a team before, and I certainly learned a lot to tell you the truth, I never worked so hard on something in my life, and I never enjoyed something that I worked hard at so much.”

JUNIOR ADVANCED PLACEMENT COURSES

H5X1- JUNIOR ADVANCED PLACEMENT US HISTORY (ONE YEAR)
(5 periods per week for 1 year - Special Permission Required).
This course addresses the Advanced Placement American History Program over a one-year period and requires that students take the AP History Examination in May. We begin with the Colonial period and continue through to contemporary times. The course prepares students for the United States History and Government Regents in June. Students work collaboratively to produce a publication based on historical themes. Both on-line and hard copy publications are produced. Some of the themes covered are income inequality, race relations, and the role of the media in American society.

H5X2- JUNIOR ADVANCED PLACEMENT US HISTORY – (TWO YEARS)
(5 periods per week for 1 year - Special Permission Required).
This is the first half of the Bronx Science two-year Advanced Placement American History program. (The second half is H7X2). It encompasses American History from colonial times through the Civil War, and it includes U. S. Government. There is emphasis given to social history and to historical interpretation. Selection is based upon previous grades in English and Social Studies, and teacher recommendation. This course requires a two-year commitment. Students must take the Regents exam in January of the senior year and the Advanced Placement exam in May of their senior year.

SENIOR SOCIAL STUDIES COURSES
Any of the following H7 classes will fulfill the senior Social Studies requirement.
ADVANCED PLACEMENT CLASSES

H7X2 – SENIOR ADVANCED PLACEMENT US HISTORY – YEAR 2
(5 periods per week for 1 year – Special Permission Required)
This is the continuation of the two-year Advanced Placement US History (H5X2) course. All seniors currently in Junior Advanced Placement US History must take the second year of the course. No other students may enroll in this course.

H7X3 - UNITED STATES GOVERNMENT AND POLITICS
(5 periods per week for 1 year - Special Permission Required).
This Advanced Placement course is taken in place of the regular senior H7/H8 social studies requirement. The course begins by examining the basic principles that underlie how our federal government is designed. The role of political parties and interest groups is examined. Topics such as the differences in the way that citizens of different races and gender vote and issues surrounding the relationship between the branches of government will be examined by a series of case studies. In class debates topics include campaign finance reform and its' relationship to the First Amendment to the Constitution. Finally, the course will cover the Supreme Court and some of its recent decisions in the area of civil rights and civil liberties.

While this course will discuss the historical foundations of, and the theory behind, our governmental system, the emphasis will be on contemporary political issues. Students will be encouraged to form their own opinions on today’s controversial issues. Whether you are a conservative, a radical, a liberal or a moderate, students interested in this subject should find the class both informative, exciting, and different. Requirements for admission to this class include a minimum average of 90 in Social Studies and English and a pre-test administered by the Social Studies Department. Students who take the course must take the AP Exam in May.

H7X5 – ADVANCED PLACEMENT MICROECONOMICS
(5 periods per week for 1 year - Special Permission Required).
This Advanced Placement course is taken in place of the regular senior H7/H8 social studies requirement. Microeconomics is the theory of the free market that focuses on how business owners and households make economic decisions. The course will also include an aspect of public policy inquiry that satisfies the requirement for Participation in Government as well as enhances the economics course. This inquiry reflects the current events of the fall term.

H7X7 – ADVANCED PLACEMENT MACROECONOMICS
(5 periods per week for 1 year - Special Permission Required).
This Advanced Placement course is taken in place of the regular senior H7/H8 social studies requirement. Macroeconomics is the theory of the free market that looks at the economy as a whole. It includes national income and price determination, economic performance measures, economic growth and international economics. Money, banking, monetary policy and inflation are important topics. The course also includes an aspect of public policy inquiry that satisfies the requirement for Participation in Government as well as enhances the economics course. This inquiry will reflect the current events of the fall term.
**H7X9 – ADVANCED PLACEMENT MICRO/MACROECONOMICS**
(5 periods per week for 1 year - Special Permission Required).
This Advanced Placement course is taken in place of the regular senior H7/H8 social studies requirement and is an accelerated combination of both Advanced Placement Economics courses. Upon completion of this course, students will take the Advanced Placement Microeconomics and Macroeconomics examinations.

**NON-AP SOCIAL STUDIES COURSES / SENIOR SELECTIVES**
Selective units will be taught during the last six weeks of the spring term. The first term will be Participation in Government and the second will be Economics. The last six weeks of the second term is devoted to any one of the following selective topics

**IMPORTANT NOTE ABOUT SELECTIVE COURSES:**
- All selective courses cover the same material until the last six weeks of the term, at that time selective classes begin to learn material specific to the course title.
- The Program Committee will try to honor student requests for selective courses however another selective course may be substituted for a selective at the discretion of school personnel due to scheduling difficulties or class size limitations
- Some or all of the selectives may not run.

**H7 – PARTICIPATION IN GOVERNMENT/ECONOMICS**
(5 periods per week for 1 year – Not a Special Permission Course)
This senior course satisfies the H7/H8 graduation requirement. The fall term is devoted to an examination of the American Economy as we enter the twenty-first century. Basic economic institutions will be examined including banking, labor, taxation and international trade. Comparisons will be made with other economic systems. The Participation in Government course is taught during the spring term. The curriculum includes a study of the American system of government. The Constitution is a focal point of study and it is examined from both historical and contemporary perspectives. Students will also be involved in a “participation in government” experience.

**H7J – INTRODUCTION TO PSYCHOLOGY**
(5 periods per week for 1 year – Not a Special Permission Course)
This senior course satisfies the H7/H8 graduation requirement. Intended as an introduction to the basic ideas of psychology, this course will show how these concepts apply to individual behavior. It will then explore the role psychology has played in the shaping of American life in the 20th century. Among the areas under consideration for investigation are advertising, politics, ethnicity, consumer decisions, health care, the stock market, television programming and other areas of our culture. Students will be required to complete and present a FINAL RESEARCH PROJECT to the class.
THE FOLLOWING SOCIAL STUDIES COURSES MAY BE TAKEN AS EITHER FIFTH OR SIXTH MAJORS:

These courses may be taken by Juniors & Seniors as a second Social Studies Course (5th or 6th Major). They can also be used by students who have completed H7/H8 by June and need a course to satisfy their senior Social Studies requirements.

- HFX5 - Advanced Placement Microeconomics
- HFX7 - Advanced Placement Macroeconomics
- HFX9 – Advanced Placement Micro/Macroeconomics
- HGX1 – Advanced Placement US Government & Politics

**Advanced Placement Courses for Accelerated Students & Students Currently in AP US History**

THE FOLLOWING COURSES MAY BE TAKEN:

- As a 5th or 6th major, by seniors currently in Advanced Placement History
- By accelerated students who have completed the required sequence for graduation to satisfy their senior social studies requirement. (Accelerated students may also take HRX5 and HRF1 to satisfy their senior Social Studies requirement.)

**HFX5 – ADVANCED PLACEMENT MICROECONOMICS** *(same as H7X5)*

(5 periods per week for 1 year - Special Permission Required).

This senior course satisfies the regular senior requirement of H7/H8. Microeconomics is the theory of the free market that focuses on how business owners and households make economic decisions. The course will also include an aspect of public policy inquiry that satisfies the requirement for Participation in Government as well as enhances the economics course. This inquiry reflects the current events of the fall term.

**HFX7 – ADVANCED PLACEMENT MACROECONOMICS** *(same as H7X7)*

(5 periods per week for 1 year - Special Permission Required).

This senior course satisfies the senior social studies requirement of H7/H8. Macroeconomics is the theory of the free market that looks at the economy as a whole. It includes national income and price determination, economic performance measures, economic growth and international economics. Money, banking, monetary policy and inflation are important topics. The course also includes an aspect of public policy inquiry that satisfies the requirement for Participation in Government as well as enhances the economics course. This inquiry will reflect the current events of the fall term.

**HFX9 – ADVANCED PLACEMENT MICRO/MACROECONOMICS** *(same as H7X9)*

(5 periods per week for 1 year - Special Permission Required).

This senior course satisfies the senior social studies requirement of H7/H8 and is an accelerated combination of both Advanced Placement Economics courses. Upon completion of this course, students will take the Advanced Placement Microeconomics and Macroeconomics examinations.
HGX1 – ADVANCED PLACEMENT US GOVERNMENT & POLITICS (same as H7X3)
(5 periods per week for 1 year – (Special Permission Required).
This senior course satisfies the senior social studies requirement of H7/H8. The course begins by examining the basic principles that underlie how our federal government is designed. The role of political parties and interest groups is examined. Topics such as the differences in the way that citizens of different races and gender vote and issues surrounding the relationship between the branches of government will be examined by a series of case studies. In class debates topics include campaign finance reform and its’ relationship to the First Amendment to the Constitution. Finally, the course will cover the Supreme Court and some of its recent decisions in the area of civil rights and civil liberties.

While this course will discuss the historical foundations of, and the theory behind, our governmental system, the emphasis will be on contemporary political issues. Students will be encouraged to form their own opinions on today’s controversial issues. Whether you are a conservative, a radical, a liberal or a moderate, students interested in this subject should find the class both informative, exciting, and different. Requirements for admission to this class include a minimum average of 90 in Social Studies and English and a pre-test administered by the Social Studies Department. Students who take the course must take the AP Exam in May.

SOCIAL STUDIES ELECTIVE MINOR:

HE1 HOLOCAUST LEADERSHIP CLASS
(5 periods per week in class + 5 periods arranged per week for 1 year – Special Permission Required)
The Holocaust Leadership elective is one of the most unique classes found in any high school in the world. Students selected from this course become administrators in Bronx Science’s internationally renowned Holocaust Museum, the only such museum in any university, college or high school. The leadership class meets one period each day and students must be willing to serve one other additional period a day (arranged hours). Interested students should see the Director of the Holocaust Museum in Room 013 or the department chairperson.

SOCIAL SCIENCE RESEARCH PROGRAM
The research program in the social sciences offers students an opportunity to do original research in all areas of social science, including but not limited to sociology, psychology, economics, political science and religious and ethnic studies. Interested students apply for sophomore research courses in the spring of their freshman year. Students who are accepted into the program take a three-year sequence of research courses. During this time, they develop and complete an independent research project and write a scientific paper, which they submit to Intel and other scientific competitions in their senior year. Students generally spend part of two summers working on their projects as volunteers, usually with an outside mentor at a local university. Complementing this major research project, students also participate in a variety of problem-solving individual and team projects and skill-building activities in the classroom.
It is expected that students who enroll in the research program will complete the three-year sequence. Technical Drawing is incorporated into the sophomore research classes, and satisfactory completion of a sophomore research class satisfies the graduation requirement for Technical Drawing. Students who do not continue to Junior Research classes are required to take STL as juniors. Students who do not satisfactorily complete senior research classes are required to take STL.

**HUP* – SOPHOMORE SOCIAL SCIENCE RESEARCH**
(5 periods per week for one year – Special Permission Required, 6th major only)
Students will find mentors at local universities working in areas of interest to them to serve as project mentors. Students will develop an individual independent research project and write a formal research proposal, which they will present and defend during the spring semester. In addition, students will participate in a variety of individual and team projects and contests that will hone their problem-solving and research skills. Technical drawing and statistics, which will help students develop skills useful in presenting their projects and verifying their findings, are incorporated in the course. Students are expected to devote part of the summer between their sophomore and junior year to working on their research project.

**HUP3 - JUNIOR SOCIAL SCIENCE RESEARCH**
(5 periods per week for one year – Special Permission Required, elective minor)
Students continue work on their individual independent research projects. They present a research progress report during the fall semester and write a draft of their research paper in the spring semester. They continue to participate in a variety of individual and team projects and contests that will hone their problem-solving and research skills. Students are expected to devote part of the summer between their junior and senior year to working on their research project.

**HUP5 – SENIOR SOCIAL SCIENCE RESEARCH**
(5 periods per week for one year – Special Permission Required, elective minor)
Students complete work on their individual independent research projects. The product of the research work is the scientific research paper. Students will submit their papers to Siemens-Westinghouse, Intel, NYCSEF, NYAS, Otto Bergdorf and other contests during the fall semester. Students will present a research seminar during the spring semester and provide assistance to sophomore and junior research students.
THE MATHEMATICS DEPARTMENT

Mathematics is important to every student. Our Math program is designed to help students not only expand their computational skills but also develop their conceptual powers and thinking skills.

The Mathematics Department of the Bronx High School of Science builds directly on the curriculum standards set forth by the National Council of Teachers of Mathematics. These standards present a balance among conceptual understanding, computational skills and problem solving.

The following four standards are the important conceptual areas of mathematics:

- Number and Operation Concepts
- Geometry and Measurement Concepts
- Function and Algebra Concepts
- Statistics and Probability Concepts

Bronx Science students will be able to apply these concepts in multiple ways using numbers, graphs, symbols, diagrams, and words.

Complementing the conceptual standards are the following four standards*:

- Problem Solving and Reasoning
- Mathematical Skills and Tools
- Mathematical Computation
- Putting Mathematics to Work

*Adapted from the first edition of the New York City Performance Standards in Mathematics.

REQUIRED MATHEMATICS COURSES

Elementary Algebra: .................................................................M$1, M$2
Plane Geometry: .................................................................M$3, M$4
Intermediate Algebra and Trigonometry: .................................................M$5, M$6
Advanced Mathematical Concepts…...(for students with advanced standing) MQ7, MQ8
Note: Certain courses have an “H” (Honors) designation AFTER the course code. The additional “letter” does not affect the course requirement.

ELECTIVE COURSES IN MATH

MQ7 – ADVANCED MATHEMATICAL CONCEPTS
(5 periods per week for 1 year – Not a Special Permission Course)
This course is viewed as the fourth year of high school mathematics, a preparation for calculus and other college-level mathematics courses. The course covers diverse topics including: relations and functions, polynomial equations, conic sections, complex numbers, polar coordinates, sequences and series and mathematical models for real world applications. Students will make extensive use of the graphing calculator to explore advanced topics.
Students who must complete their third year of mathematics at Bronx Science are required to take this course. This course is also a pre-requisite or a co-requisite for all other advanced courses in mathematics.

**MA1 - CALCULUS**  
(5 periods per week for 1 year – Not a Special Permission Course)  
This course covers the scope of a first year college calculus course. It is designed for students who have completed Advanced Mathematical Concepts and are not taking Advanced Placement Calculus.

**MEA1 - INVESTIGATION IN COLLEGE TOPICS IN MATHEMATICS**  
(5 periods per week for 1 year – Not a Special Permission Course)  
Which of the following can be folded into a box with no top?

Can you trace the figure below without lifting your pencil from the paper and without retracing?

Have you ever heard of a rhomboctahedron? Have you ever seen a one-sided surface? Have you ever worked with a string around the earth? Have you heard of the Fibonacci sequence?

Our course in Mathematical Investigations will allow you to study interesting and unusual situations like those above. We will use scissors, straws, glue, tape, string, cardboard, game pieces, and computer software to help us in our adventures. Students will work in small groups in an informal and relaxed atmosphere.

Note: Students who have taken Math Projects should not take Investigation in College Topics in Mathematics. Advanced Mathematical Concepts is a pre-requisite or co-requisite.

**MCB1 – COMPUTER PROGRAMMING IN VISUAL BASIC AND JAVA**  
(5 periods per week for 1 year – Not a Special Permission Course)  
This course is divided into two - one term courses  
**Term 1** – Computer Programming in VISUAL BASIC - This course is designed for students who wish to learn Microsoft Windows programming using VISUAL BASIC. Students will develop Windows applications using forms, menus, controls, and event driven programs. Students will be given direction and guidance in designing and executing individualized computer projects.
Term 2 – Computer Programming in JAVA - This course is designed for students who want to learn to program and debug projects in the JAVA programming language. Projects will include topics such as the Game of Life (cellular simulations), Threading Mazes, and the Tower of Hanoi (recursion). This course is suggested for students who are seriously interested in programming. It is excellent preparation for students who wish to take the Advanced Placement Computer Science course in the future.

ADVANCED PLACEMENT MATH CLASSES

MAX1 - ADVANCED PLACEMENT MATHEMATICS - CALCULUS AB
MBX1 - ADVANCED PLACEMENT MATHEMATICS - CALCULUS BC
(7 periods per week for 1 year – Special Permission and a Qualifying Test Required)
Calculus AB and Calculus BC are college-level courses offered to students who have completed four years of high school mathematics or the equivalent. Calculus BC is more extensive and more intensive than Calculus AB. Prerequisite: Advanced Mathematical Concepts. Students may receive college credit and/or advanced standing in college placement depending upon the mark received on the required College Board Advanced Placement exam given in May.

MCX3 - ADVANCED PLACEMENT COMPUTER SCIENCE - JAVA
(5 periods per week for 1 year – Special Permission Required)
This is a college-level computer science course in which students will learn to write structured programs in JAVA. They will study “data structures” and apply their skills by completing a series of structured projects. Students need to have prior computer experience. Students may receive college credit and/or advanced standing in college placement depending upon the mark received on the required College Board Advanced Placement exam given in May.

MEX1 - ADVANCED PLACEMENT STATISTICS
(5 periods per week for 1 year – Special Permission Required)
The AP Statistics course is the equivalent of an introductory statistics course offered in colleges and universities. The course deals with the statistical methodology used in research, data analysis, and the theoretical basis for these statistical techniques. It includes probability distributions, hypothesis testing and linear regression. Students interested in mathematics, engineering, business, or the biological or social sciences, and who have shown evidence of mathematical proficiency, are excellent candidates for this course. The material covered is extremely valuable to those planning to engage in research in science, mathematics or the social sciences. The course may be taken in junior or senior year. Students may receive college credit and/or placement depending upon the mark received on the required College Board Advanced Placement exam given in May.

NOTE:
STUDENTS WHO TAKE ADVANCED PLACEMENT COURSES ARE REQUIRED TO TAKE CORRESPONDING AP EXAMS IN MAY.
THE ADVANCED PLACEMENT Exam Fee is $83 per exam.
ADVANCED MATHEMATICS CLASSES

MEM1 – MULTIVARIABLE CALCULUS
(5 periods per week for 1 year – Special Permission Required)
This course is designed for students who have completed any level of Calculus or who will be taking AP Calculus as a co-requisite. The course extends the limit, differentiation, and integration concepts of first year calculus to functions of more than one independent variable. Some of the topics covered are The Geometry of Space, Partial Derivatives, Multiple Integrals and Second-Order Differential Equations. Students will solve problems by methods of traditional analysis and through use of the graphing calculator.

MLD1 – LINEAR ALGEBRA AND DIFFERENTIAL EQUATIONS
(5 periods per week for 1 year – Special Permission Required)
This course is designed for students who have completed any level of Pre-Calculus or who will be taking Honors Pre-Calculus (as a co-requisite). Students will gain experience using differential equations to explore various phenomena such as Electric Fields, Forensic Evidence, Drug Metabolism, Predator-Prey Interactions, Electrical Circuits, Chemical Reactions, and Chaotic Motion. Students will be taught to solve systems of Linear Equations using Matrices leading to the development of Vector Spaces. Various uses of Linear Transformations will be explored, including Computer Graphics applications. Solutions to first and second order Differential Equations will be explored by analytic methods as well as interactive Computer Software and Graphing Calculators. The course will culminate in the exploration of solutions to nonlinear systems of Differential Equations by using Linearization techniques. Students interested in pursuing careers in Math, Physics, Engineering (Electrical, Civil, Aerospace, Chemical) as well as Medical Research would benefit greatly from taking this course.

THE MATHEMATICS DEPARTMENT ENRICHMENT PROGRAM

MNTA – FRESHMAN MATH TEAM
MNTB - SOPHOMORE MATH TEAM
MNTC - JUNIOR MATH TEAM
MNTD - SENIOR MATH TEAM
(5 periods per week for 1 year – Elective Minor - Not a Special Permission Course – taken in lieu of lunch)
The sophomore, junior and senior math teams are designed for sophomores, juniors, and seniors who are interested in mathematics competitions. Students will be taught interesting mathematics and advanced problem solving techniques. The teams enter several competitions. These teams meet during a lunch period and students are permitted to eat lunch in class. Note: Math Team enrollment is based upon a qualifying examination.
**MER* – SOPHOMORE MATH PROJECTS**
(5 periods per week for 1 year – 6th major only - Special Permission Course)
Students who are interested in doing independent research in mathematics are encouraged to enroll in the math projects class. Most students enter this program at the beginning of sophomore year. This class stimulates students to think in creative ways. Students explore interesting topics outside the traditional mathematics curriculum and receive guidance in selecting a topic and completing a project. These projects may be entered in the Math Fair, New York Academy of Sciences Expo and other contests. Students will continue their research and, in senior year, will enter the Intel Science Talent Search, Siemens-Westinghouse and other contests. Students will continue to work on their projects through senior year. (This course may be taken in lieu of required TTD -Technical Drawing.) Students may also register for Sophomore Math Team (MNTB.)

**MER 3 – MATH PROJECTS**
(5 periods per week for 1 year – Elective Minor - Special Permission Course - taken in lieu of lunch)
Students continue to work on their individual independent research projects. Students will attend regularly scheduled classes and will also meet individually with their projects teacher/advisor. As needed, students will work with outside mentors. In addition, students will be expected to enter their projects in a variety of different appropriate contests. (This course will be taken in lieu of STL – Science Techniques Lab). Students may also take this course concurrently with Junior Math Team (MNTC.) Students enrolled in this course are committed to completing Math Projects through senior year.

**MER 5 – MATH PROJECTS**
(5 periods per week for 1 year – Elective Minor - Special Permission Course - taken in lieu of lunch)
Students finalize their work on their individual independent research projects. Students will attend regularly scheduled classes and will also meet individually with their projects teacher/advisor. As needed, students will continue to work with outside mentors. In addition, students will be expected to enter their projects in the Intel Science Talent Search, Siemens-Westinghouse and other contests. Students may also take this course concurrently with Senior Math Team (MNTD.)
THE BIOLOGICAL SCIENCE DEPARTMENT

In a world of rapid technological advances educated young people need to acquire not only knowledge of “cutting edge” technology, but also how to apply this technology to solving everyday problems. They also need skills that will enable them to logically and clearly analyze the data that technology presents.

Through hands-on experience in science and by becoming more sophisticated in conducting investigations and explaining their findings students will accumulate a set of concrete experiences on which they can draw. At the same time, conclusions presented to students (in books and in class) about how scientists explain phenomena are augmented by information on how the science community arrived at those conclusions. Indeed, as students move through school, they should repeatedly be encouraged to ask, "How do we know this is true?"

Scientific Inquiry is at the foundation of all our studies in the Biology Department. Our philosophy is that if students actively participate in scientific investigations that progressively approximate good science, the picture they come away with will be reasonably accurate.

The nature and importance of prediction in science is emphasized in all courses. We stress the use of statistics, probability, and modeling in making scientific predictions about complex phenomena found in biological systems.

By the end of the 12th grade, students should know the following:

- Investigations are conducted for different reasons, including exploring new phenomena, to check on previous results, to test how well a theory predicts, and to compare different theories.
- Hypotheses are widely used in science for choosing what data to pay attention to and what additional data to seek, and for guiding the interpretation of the data (both new and previously available).
- Sometimes scientists can control conditions in order to obtain evidence. When that is not feasible, for practical or ethical reasons, they try to observe as wide a range of natural occurrences as possible in order to discern patterns.
- There are different traditions in science about what is investigated and how, but they all have in common certain basic beliefs about the value of evidence, logic, and good arguments. There should be agreement that progress in all fields of science depends on intelligence, hard work, imagination, and even chance.
- Scientists in any one research group tend to see things alike, so even groups of scientists may have trouble being entirely objective about their methods and findings. For that reason, scientific teams are expected to seek out the possible sources of bias in the design of their investigations and in their data analysis. Checking each other's results and explanations helps, but that is no guarantee against bias.
- In the short run, new ideas that do not mesh well with mainstream ideas in science often encounter vigorous criticism. In the long run, theories are judged by how they fit
with other theories, the range of observations they explain, how well they explain observations, and how effective they are in predicting new findings.

- New ideas in science are limited by the context in which they are conceived, are often rejected by the scientific establishment, sometimes spring from unexpected findings, and usually grow slowly, through contributions from many investigators.

*(Citation: Project 2061- The American Association for the Advancement of Science)*

**FRESHMAN BIOLOGY**
Open To Incoming Freshmen

**SB1 - FRESHMAN REGENTS BIOLOGY**
(7 periods per week for 1 year – Not a Special Permission Course)
The course of study encompasses the Regents Biology curriculum, with special emphasis on learning the scientific process.

**SB1I – FRESHMAN AND SB1J - SOPHOMORE HONORS REGENTS BIOLOGY**
(10 periods per week one year - Special Permission Required).
Students who excel in ninth-grade Physical Science are selected for this class. The course of study encompasses the Regents Biology curriculum, with special emphasis on learning the scientific process by doing extended open-ended laboratory experiments. Opportunities for exciting original investigations are provided. Many important skills are developed, including how to identify a research problem, how to use crucial library resources and information technology to develop an idea, how to interpret and evaluate data using statistical methods, and hands-on experiences with many important techniques used in laboratories.

**THE BIOLOGICAL SCIENCES DEPARTMENT RESEARCH PROGRAM**
**BIOLOGY RESEARCH PROGRAM**

The research program in the biology department offers students an opportunity to do original research in all areas of biology, ranging from the impact of molecular changes on the functioning of cells to the impact of global changes on living things in our environment. *Interested students apply for sophomore research courses in the spring of their freshman year.* Students who are accepted into the program take a three-year sequence of research courses. During this time, they develop and complete an independent research project and write a scientific paper, which they submit to Intel and other scientific competitions in their senior year. Students generally spend two summers working on their projects as volunteers, usually with an outside mentor at a local university. Complementing this major research project, students also participate in a variety of problem-solving individual and team projects and skill-building activities in the classroom.

It is expected that students who enroll in the research program will complete the three-year sequence. Technical Drawing is incorporated into the sophomore research classes, and satisfactory completion of a sophomore research class satisfies the graduation
requirement for Technical Drawing. Students who do not continue to junior research classes are required to take STL as juniors. Students who do not satisfactorily complete senior research classes are required to take STL.

**SBP* – SOPHOMORE BIOLOGY/PHYSICAL SCIENCE RESEARCH**
(5 periods per week for 1 year – Special Permission Required - 6th major only)
Students will find scientists at local university laboratories working in areas of interest to them to serve as project mentors. Students will develop an individual independent research project and write a formal research proposal, which they will present and defend during the spring semester. In addition, students will participate in a variety of individual and team projects, contests, and lab activities that will hone their problem-solving and research skills. Technical Drawing, which will help students develop skills useful in presenting their projects, is incorporated in the course. Students are expected to devote the summer between their sophomore and junior year to working full-time as a volunteer on their research project.

**SBP3 - JUNIOR BIOLOGY RESEARCH**
(5 periods per week for 1 year – Special Permission Required – elective minor)
Students continue work on their individual independent research projects. They present a research progress report during the fall semester and write a draft of their research paper in the spring semester. They continue to participate in a variety of individual and team projects, contests, and lab activities that will hone their problem-solving and research skills. Students are expected to devote the summer between their junior and senior year to working full-time as a volunteer on their research project.

**SBP5 – SENIOR BIOLOGY RESEARCH**
(5 periods per week for 1 year – Special Permission Required – elective minor)
Students complete work on their individual independent research projects. The product of the research work is the scientific research paper. Students will submit their papers to Siemens-Westinghouse, Intel, NYCSEF, NYAS, Otto Bergdorf and other contests during the fall semester. Students will present a research seminar during the spring semester and provide assistance to sophomore and junior research students.

**BIOLOGY ELECTIVES**
The following electives:
- Do not fulfill the “Lab Science” (3rd major) requirement for seniors.
- May be taken as a 4th, 5th, or 6th major.

**SBX5-ADVANCED PLACEMENT PSYCHOLOGY**
(5 periods a week for 1 year – Special Permission Required – 4th, 5th or 6th major but NOT A LAB SCIENCE- This course does not fulfill the “Lab Science” requirement for seniors)
Topics studied include neuroscience and behavior, child development, adolescence and adulthood, sensation, perception, states of consciousness, learning, memory, thinking and language, intelligence, motivation, emotion, personality, psychological disorders, therapy, stress and health, social psychology and statistical reasoning. Students are required to take the Advanced Placement examination in May.
**SBE1 - BIOMEDICAL ETHICS**
(5 periods a week for 1 year – 4th, 5th or 6th major but NOT A LAB SCIENCE- Not a Special Permission Course
This course does not fulfill the "Lab Science" requirement for seniors)

This course is an introductory seminar into the problems posed by the union of modern science and technology. Students are given the opportunity to explore issues, analyze evidence, hypothesize outcomes, exercise judgment, draw conclusions, and develop their viewpoints into coherent, factually based, and debate-tested positions. Regular class activities are supplemented with role-playing exercises, public service announcements, letter writing, to the editors of newspapers regarding important bioethical issues, debates, movies, current periodicals, guest speakers, and attending lectures with renowned scientists. Discussions are open-ended and organized around the ethical issues of a series of topics. The topics will include; abortion and fetal tissue experimentation, organ transplants, genetic engineering through recombinant DNA technology, reprogenetics which may allow two parents of the same sex to have an offspring, euthanasia, animal rights, AIDS and the health care system.

**THE FOLLOWING ELECTIVE COURSES SATISFY THE SENIOR REQUIREMENT FOR A LABORATORY SCIENCE (3rd Major). THEY MAY ALSO BE TAKEN AS A ELECTIVE 1 (4th major), ELECTIVE 2 (5th major) or 6th MAJOR.**

**SBX1 - ADVANCED PLACEMENT BIOLOGY**
(10 periods per week for 1 year: 6 lecture periods and 2 double laboratory periods – Special Permission Required – Fills the Lab Science Requirement for seniors – 3rd, 4th, 5th or 6th major).

This course is typical of introductory Biology courses taught in colleges and universities. Fundamental concepts applicable to both plants and animals are selected. In lecture, biochemistry and molecular biology lay the groundwork for understanding all aspects of modern biology, from the cell through the ecosystem. In laboratory work, evolution is the integrating theme that focuses on the relationship of organisms to their environments. Students should complete at least 1 year of biology, 1 year of chemistry, and 3 years of mathematics before taking this course. Most students taking this course receive credit and/or, advanced placement at their respective colleges based upon their score on the Advanced Placement Exam.

**SBX3 – ADVANCED PLACEMENT ENVIRONMENTAL SCIENCE**
(6 periods per week for 1 year: 6 lecture periods per week – 4 single periods + 1 double period lab – Special Permission Required – Fills the Lab Science Requirement for seniors – 3rd, 4th, 5th or 6th major).

This course follows an entry-level college syllabus. It provides students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and man-made, and to evaluate alternative solutions for resolving them.

Students have the opportunity to work on individual and group research projects, use computer technology and Internet resources, and visit natural areas in New York City parks. Laboratory investigations, debates, and simulations are included in the course activities. The course can be taken for college credit and/or Advanced Placement credit.
**SBA1 - ANIMAL BEHAVIOR and HUMAN PSYCHOLOGY**

(A one-year sequence of two one-semester courses. 6 periods per week: 1 triple period, 1 double period, and 1 single period – Not a Special Permission Course - Fills the Lab Science Requirement for seniors – 3rd, 4th, 5th or 6th major). (Note: There may be time conflicts with students involved in sports team practice. Enrollment is limited to seniors.)

**Fall Term - ANIMAL BEHAVIOR**

This course develops the thesis that behavior in all animals has evolved as an adaptation of survival of species. Behaviors that are universal among all animal species, including humans, are stressed and the mechanisms that species use to carry out the behaviors common to all are observed. The Bronx Zoo is used as a laboratory. Students develop individual projects. This course is scheduled at the end of the day to allow for field trips during the triple period.

**Spring Term - HUMAN PSYCHOLOGY**

In this course, a study of human behavior shows that common animal behaviors are present in humans but modified, as the machinery for carrying out the behaviors has become more complex. The course includes the effects of learning, stress, conflict, environment, heredity, and social organization on the development of human personality. A research project conducted at the Bronx Zoo.

**SBC1 – PLANT PHYSIOLOGY AND HORTICULTURE**

(5 periods per week for 1 year: 2 double period labs, 1 period recitation – Not a Special Permission Course - Fills the Lab Science Requirement for seniors – 3rd, 4th, 5th or 6th major). Using plants grown from seeds and cuttings in our two greenhouses, students will examine plant life cycles, structures, characteristics, requirements and general care Soil structure, propagation methods, plant diseases and treatments will be discussed. Students participate in planning, planting and caring for an outdoor garden, and learn how to make ornamental arrangements. Modern techniques such as cloning and hydroponics will be introduced. An appreciation for the need for conservation practices is developed in the classroom and on field trips.

**SBG1 – GENETICS**

(A one-year sequence of two one-semester courses - 5 periods per week: 2 double periods 1 single period – Not a Special Permission Course - Fills the Lab Science Requirement for seniors – 3rd, 4th, 5th or 6th major, Pre-requisite: AP Biology).

This course follows the sequence of genetic discoveries. It begins with the “dance of the chromosomes” during mitosis and meiosis. A natural progression is made from meiosis to the identification of Mendel’s unit characters, the genes. Correlating genes with chromosomes leads to the construction of genetic maps. A discussion of chromosome mutations shed light on how map accuracy has been improved. Chromosome and gene mutations will be studied with special emphasis on human applications. Laboratory experiences involve breeding mutant Drosophila in order to discover Mendel’s classic laws of inheritance. The course will then apply the principles of classic Mendelian genetics to current molecular genetics and techniques. The molecular nature of the gene and gene regulation will be studied in detail. In a genetic engineering lab, students will isolate, transform DNA from bacterial cells. Students will analyze transgenic animals to localize gene expression and protein function. Finally, students will isolate and analyze chromosome structure. State of the art advances will be introduced through field trips and guest speakers.)
**SMB1 - MICROBIOLOGY**
(5 periods per week for 1 year: 1 single recitation period, 2 double laboratory periods. Not a Special Permission Course. Fills the Lab Science Requirement for seniors – 3rd, 4th, 5th or 6th major).

Are 95% of all bacteria harmless or even useful? Are microbes involved in making beer? Bread? Cheese? Yogurt? Pickles? Sauerkraut? Yes! Study microbiology and discover the incredible world of microscopic life! This college level introduction to microbiology will examine bacteria, algae, fungi, protozoa and viruses and their relationship with humans. The anatomy, growth, nutrition, mechanisms of metabolism and energy conversion, and genetics of microorganisms will be discussed. Viruses, their methods of multiplication and their effects on cells will be included. Since 5% of bacteria are pathogenic the challenges of infectious diseases and bio-terror will be a major focus and will include the study SARS, AIDS, malaria, tuberculosis, anthrax, and smallpox. Host-parasite relationships, types of diseases, the principles of immunology, antibiotics and other forms of microbial control will be discussed. Genetic engineering of microbes for engineering for agriculture, industrial production, and environmental remediation will be introduced. Laboratory procedures include: use of different types of media, staining methods, microscopic identification of organisms, biochemical markers, food and water quality testing, bacterial transformation and the use of specialized apparatus and equipment.

Upon satisfactory completion of the course, 3 college credits may be granted from the State University of New York at Albany. SUNY Albany will charge a fee (TBD).

**SBJ1 - EPIDEMIOLOGY**
(5 periods per week, including lab – fulfills the "Lab Science" requirement for seniors – May be taken as a 3rd, 4th, 5th or 6th Major – Not a Special Permission Course)

This course is designed to introduce students to the field of epidemiology. The course will focus on approaches and activities that are used to study disease distributions (from infectious disease outbreaks to chronic disease surveillance). Students will explore the characteristics of a range of specific disease agents (HIV, Ebola, Cancer, etc.), compare their impact on populations and examine national and global efforts to monitor and control disease. Computer simulations are included.

**SBN1 - NUTRITIONAL SCIENCE**
(5 periods per week for 1 year: 3 single recitation periods, 1 double laboratory period - Fills the Lab Science Requirement for seniors – 3rd, 4th, 5th, or 6th major - Not a Special Permission Course).

This course explores topics in nutrition and food science. The study of food and nutrients includes discussion of their sources, chemistry, and metabolism. The effects of cooking on food are examined in the laboratory sessions in which basic culinary skills are learned along with "kitchen chemistry." Student interest leads to further investigation of special topics such as the mechanism of hunger, the development of new food products, the management of diet in health and disease, and the global problem of world food shortages. Guest speakers, trips, and videotapes enhance the curriculum. Each student does a personal diet evaluation, and enjoys sharing food projects with classmates.
NOTE: This is the only laboratory science in which you eat your experiments! ;-)

Upon satisfactory completion of the course, 3 college credits may be granted from The State University of New York at Albany. SUNY Albany will charge a fee (TBD).

SBF5 - FORENSIC SCIENCE
(5 periods per week for 1 year: 3 single recitation periods, 1 double laboratory period - Fills the Lab Science Requirement for seniors – 3rd, 4th, 5th, or 6th major - Not a Special Permission Course – Four college level credits available).  
Forensic Science is focused upon the application of scientific methods and the techniques to crime and law. Recent advances in scientific methods and principles have had an enormous impact upon law enforcement and the entire criminal justice system. This course is intended to provide an introduction to understanding the science behind crime detection. Scientific methods specifically relevant to crime detection and analysis will be presented with emphasis placed upon techniques used in evaluating physical evidence. Topics and laboratory investigations included are: crime scene investigations, fingerprinting, document and handwriting analysis, ballistics, serology, hair and fiber examination, botany, organic and inorganic evidence analysis, entomology, the role of the medical examiner, the forensic autopsy, anthropology, germ warfare, DNA analysis, psychology and profiling, toxicology, paint analysis, glass comparisons and fragmentation, arson investigations, tire and foot impressions and casts. A case study and a current events approach will be used extensively. Guest speakers, videotapes, mock trials, and field trips are used. A shadow program is in place for students interested in career opportunities in the field.

Students may receive 4 college credits through Syracuse University for a tuition charge of approximately $450. Tuition assistance is available for eligible students who are unable to manage the costs.

NOTE:
STUDENTS WHO TAKE ADVANCED PLACEMENT COURSES ARE REQUIRED TO TAKE CORRESPONDING AP EXAMS IN MAY.
The ADVANCED PLACEMENT Exam Fee is $83 per exam.
THE PHYSICAL SCIENCE DEPARTMENT

High school science should create citizens who understand science in ways that will enable them to participate intelligently in critical thinking, problem solving and decision making about how science and technology are used to change society.

Our courses emphasize the importance of first hand laboratory experience. An important aspect of the basic Physics and Chemistry courses is the weekly laboratory exercise. All of the electives provide the opportunity to work in the lab. Students have hands on experience in designing electronic devices in our Electronics course. Astronomy students utilize the facilities of Lehman College and our own planetarium. The Geology, Meteorology and Oceanography course provides students the opportunity to use meteorological data acquisition from the on-site weather station and to use the Internet to access and analyze weather and geological data. Organic Chemistry students are learning the processes of synthesizing and analyzing compounds with the use of IR Spectroscopy.

In addition to their academic studies at Bronx Science, students are encouraged to expand their horizons while becoming involved in research, attending lectures and workshops and participating in contests and competitions, which enable them to share their knowledge with others.

Computers are used to collect and interpret real time data, access the Internet and use simulation software in the newly constructed Physical Science Computer Laboratory to help understand abstract scientific concepts.

Computers in our Physical Science Research Center enable students to access information that will be used in their research projects. Many students are involved in research for competitions such as Intel Science Talent Search, NYC Expo and the International Bridge Building Contest. Some students are involved in the Space Science Student Involvement Competition, in which students are asked to design a colony on Mars and others in the Toshiba/Exploravision Competition, for which students must create a vision of a technology of the future.

Students have the opportunity to earn college credit by enrolling in the Advanced Placement Chemistry and Physics courses. Three of our courses, Geology, Meteorology and Oceanography, Astronomy and Astrophysics and Modern Frontiers in Chemistry provide students with college credit through the State University of New York at Albany.

The opportunity to be involved in science study and research is not limited to the classroom and does not end in June. Students are encouraged to apply to a variety of programs being offered at locations in the metropolitan area and sites across the nation during the summer. Information about special opportunities is disseminated in the Physical Science Department Announcements, which is posted in each of the science classrooms every week. Students should visit the Physical Science Department Office, Room 231D often to browse through the information available on display and obtain applications.
PHYSICAL SCIENCE RESEARCH PROGRAM

The research program in the Physical Science department offers students an opportunity to do original research in all areas of physical science such as material science, engineering, computer science, earth science, chemistry, physics, and astrophysics. Interested students apply for sophomore research courses in the spring of their freshman year. Students who are accepted into the program take a three-year sequence of research courses. During this time, they develop and complete an independent research project and write a scientific paper, which they submit to Intel and other scientific competitions in their senior year. Students generally spend two summers working on their projects as volunteers, usually with an outside mentor at a local university. Complementing this major research project, students also participate in a variety of problem-solving individual and team projects and skill-building activities in the classroom.

It is expected that students who enroll in the research program will complete the three-year sequence. Technical Drawing is incorporated into the sophomore research classes, and satisfactory completion of a sophomore research class satisfies the graduation requirement for Technical Drawing. Students who do not continue to Junior Research classes are required to take STL as juniors. Students who do not satisfactorily complete senior research classes are required to take STL.

SBP* – SOPHOMORE BIOLOGY/PHYSICAL SCIENCE RESEARCH
(5 periods per week for 1 year – Special Permission Required - 6th major only)
Students will find scientists at local university laboratories working in areas of interest to them to serve as project mentors. Students will develop an individual independent research project and write a formal research proposal, which they will present and defend during the spring semester. In addition, students will participate in a variety of individual and team projects, contests, and lab activities that will hone their problem-solving and research skills. Technical Drawing, which will help students develop skills useful in presenting their projects, is incorporated in the course. Students are expected to devote the summer between their sophomore and junior year to working full-time as a volunteer on their research project.

SPP3 - JUNIOR PHYSICAL SCIENCE RESEARCH
(5 periods per week for 1 year – Special Permission Required – elective minor)
Students continue work on their individual independent research projects. They present a research progress report during the fall semester and write a draft of their research paper in the spring semester. They continue to participate in a variety of individual and team projects, contests, and lab activities that will hone their problem-solving and research skills. Students are expected to devote the summer between their junior and senior year to working full-time as a volunteer on their research project.

SPP5 – SENIOR PHYSICAL SCIENCE RESEARCH
(5 periods per week for 1 year – Special Permission Required – elective minor)
Students complete work on their individual independent research projects. The product of the research work is the scientific research paper. Students will submit their papers to Siemens-Westinghouse, Intel, NYCSEF, NYAS, and other contests during the fall semester. Students will present a research seminar during the spring semester and provide assistance to sophomore and junior research students.
REQUIRED PHYSICAL SCIENCE COURSES:
Regents Chemistry – usually taken in the sophomore year
Regents Physics - usually taken in the junior year.

SC1 – SOPHOMORE CHEMISTRY
(7 periods per week including 1 double period lecture and 1 double period laboratory - Required)
This course covers the New York State Regents Syllabus in Chemistry.

SP1C – JUNIOR PHYSICS
(7 periods per week including 1 double period lecture and 1 double period laboratory - Required)
This course covers the New York State Regents Syllabus in Physics.

PHYSICAL SCIENCE HONORS COURSES
The following courses may be taken in lieu of the regular Regents Physics/Regents Chemistry courses:

SC1I – FRESHMAN HONORS CHEMISTRY
(10 periods per week including 1 double period laboratory – Special Permission Required)
This course covers the New York State Regents Syllabus in Chemistry in greater detail than the non-honors courses. Students are required to participate in national and international project competitions. Additional topics will also be covered that are not included in the Regents Syllabus but are appropriate for the SAT II examination in Chemistry.

SC1J - SOPHOMORE HONORS CHEMISTRY
(10 periods per week including 1 double period laboratory – Special Permission Required)
This course covers the New York State Regents Syllabus in Chemistry in greater detail than the non-honors courses. Students are required to participate in national and international project competitions. Additional topics will also be covered that are not included in the Regents Syllabus but are appropriate for the SAT II examination in Chemistry.

SC1K - JUNIOR HONORS CHEMISTRY
(7 periods per week including one double period laboratory - Special Permission Required)
This course covers the New York State Regents Syllabus in Chemistry in greater detail than the non-honors courses. Students are required to participate in national and international project competitions. Additional topics will also be covered that are not included in the Regents Syllabus but are appropriate for the SAT II examination in Chemistry.

SPIJ - SOPHOMORE HONORS PHYSICS
(10 periods per week including 1 double period laboratory – Special Permission Required)
This course covers the New York State Regents Syllabus in Physics in greater detail than the non-honors courses. Students are selected from Freshman Honors Chemistry to participate in this course. Preference is given to students who exhibit strong mathematical skills. Applicants should already have taken algebra and trigonometry. The focus will be on more challenging problems with a greater emphasis on higher-level mathematical computation. Additional topics will also be covered that are not included in the Regents Syllabus but are appropriate for the SAT II examination in Physics.
SP1K - JUNIOR HONORS PHYSICS
(7 periods per week including 1 double period laboratory – Special Permission Required)
This course covers the New York State Regents Syllabus in Physics in greater detail than the non-honors courses. The focus will be on more challenging problems with a greater emphasis on higher-level mathematical computation. Additional topics will also be covered that are not included in the Regents Syllabus but are appropriate for the SAT II examination in Physics.

SENIOR ELECTIVES IN PHYSICAL SCIENCE

- All electives are Lab Sciences
- All electives are open to seniors and, if room permits, to qualified juniors.

SCR1-INTRODUCTION TO ORGANIC CHEMISTRY
(5 periods per week, including lab – fulfills the Lab Science requirement for Seniors – May be taken as a 3rd, 4th, 5th or 6th Major – Not a Special Permission Course)
Students interested in medicine, environmental law, environmental science, biology, chemistry, biochemistry, pharmacy and health sciences are strongly encouraged to take this course. Organic chemistry is a second year pre-medical course needed for entry into medical school.

The course touches upon instrumentation techniques involving infrared and UV-Vis spectroscopy, which are used in the identification and structural analysis of organic compounds. Students will also be introduced to classic laboratory methods used in purification/separation and identification of organic compounds; distillations, extractions, thin layer chromatography, column chromatography, and recrystallization methods of impure substances. This course will also cover important organic topics like mechanisms and stereoisomerism that will certainly enhance the level of preparation for any college freshman entering a pre-medical program and will provide an excellent foundation for college-level biology and chemistry courses.
Prerequisite: Regents Chemistry

SPA1-ASTRONOMY AND ASTROPHYSICS
(6 periods per week: 1 double laboratory period, 4 single recitation periods fulfills the Lab Science requirement for Seniors – May be taken as a 3rd, 4th, 5th or 6th Major – Not a Special Permission Course)
This is a college level introduction to astronomy, stressing changing ideas of the universe and humanity's place in it. It provides a clear example of the growth and use of THEORY in science.

The first term of the course deals with the history of our knowledge of the solar system-Sun, Moon, Earth, and the other planets-from the earliest watchers and simple fables to the magnificent success of Newton's gravitational theory.
The second term is an introduction to the stellar astronomy: nature of light and matter, characteristics of stars, birth, evolution and death of stars, neutron stars, black holes, galaxies, the Big Bang, and cosmology and the principles of Einstein's theory of relativity.
The school planetarium is used to demonstrate the observed phenomena that any theory of
the universe must explain. Students will be able to identify seasonal star patterns and locate planets.

Students may contract to receive honors credit contingent upon permission of the teacher and the completion of advanced projects for the course. Upon satisfactory completion of this yearlong course, 3 college credits may be granted from the New York State University at Albany. A fee is required for college credit.

Prerequisite or Co-requisite: Regents Physics

**SPE1 – ELECTRONICS**

(5 single periods per week, including lab for one-year - fulfills the “Lab Science” requirement for Seniors – May be taken as a 3rd, 4th, 5th or 6th Major – Not a Special Permission Course)

This course is for seniors and juniors. The first term covers analog electronics. Electronic components such as resistors, capacitors, diodes, and transistors are studied. Important circuit groupings studied include amplifiers, timing circuits, rectifiers, and oscillators. These are groupings that occur in practically all-modern electronic devices. Familiarity with multi-meters and oscilloscopes is developed. The second term is devoted to digital electronics so important in this computer age. Boolean algebra, logic circuits, and timing diagrams are studied. Students will build simple counters and clocks. The emphasis for both terms is on developing practical skills in building circuits.

Prerequisite or Co-requisite: Regents Physics

**SPE3 – PHYSICS OF ENGINEERING**

(10 periods per week, 5 Lectures, 5 Laboratory Periods per Week - FULFILLS THE “LAB SCIENCE” REQUIREMENT FOR SENIORS AND SECOND ELECTIVE REQUIREMENT – Will be considered 3rd and 5th Major – Not a Special Permission Course) This will be a 2-credit class. This class will be taught both by Physics and Technology Instructors.

This course will help students understand the major concepts presented in the study of engineering. Topics to be covered include digital electronic engineering, engineering design, computer integrated manufacturing, and civil and architectural engineering skills. Students will be introduced to the various fields of the engineering discipline and explore various technology systems and manufacturing processes. The course teaches problem-solving skills using a design developmental approach. Students will learn how advances in engineering affect society and technological change. This course combines mathematics, physics, and technology in a comprehensive manner. Students will hone their problem-solving skills to solve real world problems by participating in engineering competitions, which include Society of Plastics Engineers, Junior Engineering technology Society, Bridge Building Competition, and the Robotics Competition. This exciting and innovative course will be a particular asset to those students intending to pursue a major or career in the field of engineering. This course will present an interdisciplinary approach to physics, engineering and technology.

Prerequisites: Regents Physics and Regents Chemistry
PHYSICAL SCIENCE ADVANCED PLACEMENT COURSES

Departmental Approval Required

AP Chemistry and AP Physics are one-year courses given 10 periods per week. Selected interested and outstanding students are permitted to undertake these advanced placement courses. Successful completion of these courses entitles students to claim credit for first year chemistry or physics in the colleges participating in the program. The courses are college level courses.

SCX1 - ADVANCED PLACEMENT CHEMISTRY
(10 periods per week: 5 double periods, including lab –one year - fulfills the "Lab Science" requirement for Seniors – May be taken as a 3rd, 4th, 5th or 6th Major – Special Permission Required)

This is a course in chemical concepts and their applications. The syllabus is geared toward outstanding students planning careers in medicine, science, and engineering. It will provide invaluable adjustments to the rigors and sophistication of university work through a laboratory and problem-solving program, with individual attention. During recitation, students have the opportunity to ask questions, interact, and examine concepts in more detail than would be possible in a crowded lecture hall in college.

Successful completion of this course may enable students to claim credit for an entire year of college chemistry.

Prerequisite: Grade of 90 or better in Regents Chemistry and Mathematics

SPX1 - ADVANCED PLACEMENT PHYSICS WITHOUT CALCULUS (B)
(10 periods per week: 5 double periods, including lab –one year - fulfills the "Lab Science" requirement for Seniors – May be taken as a 3rd, 4th, 5th or 6th Major – Special Permission Required)

This is a course in General Physics. Topics covered will be mechanics, thermodynamics, waves, electricity, magnetism, optics, modern physics, and nuclear physics. The course will emphasize a qualitative and quantitative understanding of the laws of physics, and their applications. The level of instruction is based on knowledge of algebra, geometry, and trigonometry.

The course is designed for outstanding students seeking careers in biology, medicine, engineering, and science. Through individual attention and group work based on cooperative learning, experience will be gained in problem solving and laboratory techniques, thus providing invaluable help in making the adjustment to the sophistication of university work. Successful completion of this course will enable students to acquire up to four credits of college university Physics.

Prerequisite: Grade of 90 or better in Regents Physics and Mathematics

Pre or Co requisite: Advanced Mathematical Concepts
SPX3 - ADVANCED PLACEMENT PHYSICS WITH CALCULUS (C)
(10 periods per week: 5 double periods, including lab – one year - fulfills the "Lab Science" requirement for Seniors – May be taken as a 3rd, 4th, 5th or 6th Major – Special Permission Required)

This course covers two major areas for freshman college physics: “mechanics” (forces, energy, etc.) and "electricity and magnetism" as well as “thermodynamics” and other selected topics. Those planning a future in the physical sciences or engineering should apply for this course.

Prerequisite: Grades of 90 or better in Regents Physics and Advanced Mathematical Concepts. Pre or Co requisite: Calculus

NOTE:
STUDENTS WHO TAKE ADVANCED PLACEMENT COURSES ARE REQUIRED TO TAKE CORRESPONDING AP EXAMS IN MAY.
THE ADVANCED PLACEMENT Exam Fee is $83 per exam.
THE FOREIGN LANGUAGE DEPARTMENT

Language is our connection to our community and to the world. Through language, we identify the world around us, express our concerns and dreams, and share our experiences and ideas.

The ability to communicate in a second language increases the opportunities to interact with other peoples and to understand other cultures. As the world becomes increasingly interdependent, it is important for every person to acquire the skills for communication with others and for cross-cultural understanding.

In addition to the practical application of communication skills, the benefits derived from the study of a second language are many. Empirical findings indicate that second language study is an asset to many careers and to professional advancement in the Sciences as well as the Humanities. Second language study:

- prepares students for a world in which nations and peoples are increasingly interdependent
- fosters a sense of humanity and friendship
- increases students' adaptability to different environments and modes of acting and thinking
- furnishes the key to thinking patterns, cultures and social institutions of other peoples
- provides insights into the human mind and language itself
- develops the skills and habits essential to the learning process, creative inquiry and critical thinking
- helps students to increase their sensitivity to and understanding of the language, values, customs and traditions of others
- leads students to discover and examine their own personal values and civic responsibilities
- provides insight into America's values and an appreciation of national responsibilities in the world community

*The above findings appear in the New York State Syllabus: MODERN LANGUAGES FOR COMMUNICATION

In light of these benefits, the study of a second language should be an integral part of every student's educational experience. Bronx High School of Science's Language Department offers students more enrichment opportunities to study other languages than any other secondary school in the country. Our students are best prepared as informed and productive citizens in an increasingly multi-diverse and inter-dependent world.

Any Language Class may be taken as a 5th (elective 2) or 6th Major for all students who have completed their Regents requirement (2 years of foreign language at Bronx Science and passing a Regents exam).
FOREIGN LANGUAGE ELECTIVE COURSES

FFX9 - ADVANCED PLACEMENT FRENCH LITERATURE
FSX9 - ADVANCED PLACEMENT SPANISH LITERATURE
(5 single periods per week for one year - May be taken as a 5th or 6th Major – Special Permission Required)
AP Spanish and AP French Literature are open to juniors and seniors who have earned a grade of at least 93 percent in the third or fourth year of language. These are college level courses and a grade of 4 or 5 on the exam may give students an opportunity to receive college credit or advanced placement status. Students must submit a writing sample and complete an interview with instructor prior to admission into the course. Recommended prerequisites are Advanced Placement Language courses.

These literature courses prepare students to:
• Understand a lecture in the foreign language and participate in discussion on a literary topic.
• Read literary works in all genres of the language.
• Critically analyze outstanding literary works.

FJX1 - ADVANCED PLACEMENT JAPANESE
FFX1 - ADVANCED PLACEMENT FRENCH LANGUAGE
FTX1 - ADVANCED PLACEMENT ITALIAN LANGUAGE AND CULTURE
FSX1 - ADVANCED PLACEMENT SPANISH LANGUAGE
(5 single periods per week for one year - May be taken as a 5th or 6th Major – Special Permission Required)
The Advanced Placement Spanish, French, Italian and Japanese Language courses are open to juniors and seniors who have earned a grade of at least 93 in the third or fourth year of language. They are intended for responsible, highly motivated students who wish to complete studies in secondary school comparable in difficulty to advanced-level college courses in Composition and Conversation. Students who enroll should already have a basic knowledge of the language and culture and should have attained a reasonable proficiency in listening comprehension, speaking, reading and writing. Extensive training in aural/oral skill, reading comprehension, grammar, organization, and writing of compositions, and essays are an integral part of these courses. Students must submit a writing sample and complete an interview with the instructor prior to admission.

FF7H - FRENCH - HONORS LITERATURE
FS7H – SPANISH - HONORS LITERATURE
(5 single periods per week for one year - May be taken as a 5th or 6th Major – Special Permission Required)
These courses survey French and Spanish literature from their beginnings to the present time. Active student participation in literary analysis and interpretation will provide students with an excellent foundation for more advanced work in advanced placement literature classes. A final grade of 90 percent in third or fourth-year Spanish or French is required for admission.

FSP1 SPANISH FOR PROFESSIONS:
(5 single periods per week for one year – May be taken as a 5th or 6th Major – minimum average of 85 in Spanish – Special Permission Required)
This course is designed for motivated students of Spanish who have completed a Regents sequence. Students will study Spanish for practical, professional use in four general fields: business, finance, medicine and social services. Internship placements will be sought for all students. This course will focus on all four skills of Spanish study – listening, reading, speaking
and writing. Students should expect a rigorous course load as this course can prepare students for Advanced Placement Spanish Language. Students will be expected to complete an interview with instructor prior to admission into the course.

**FSN1 - SPANISH NARRATIVE & FILM**
(5 single periods per week for one year – May be taken as a 5th or 6th Major – minimum average of 85 in Spanish – Special Permission Required)

This course is designed for motivated students of Spanish who have completed a Regents sequence. The main purpose of the course is to enhance oral and written skills in Spanish while increasing their familiarity with Hispanic cultures through their manifestation in cinema based on literature. Grammar exercises and essay writing related to the content of the literature and films will be combined with oral discussion. This course can prepare students for Advanced Placement Spanish Language and/or Literature. Students will be expected to complete an interview with instructor prior to admission into the course.

**FFC7 - ADVANCED FOURTH-YEAR FRENCH CONVERSATION**
**FSC7 - ADVANCED FOURTH-YEAR SPANISH CONVERSATION**
(5 single periods per week for one year - May be taken as a 5th or 6th Major – Special Permission Course)

These courses are designed to help students maintain and improve their conversational reading and writing skills developed in the first three years. Emphasis is placed on the active use of the spoken language. Extensive use of a variety of texts, newspaper articles, videotapes, and audio recordings will provide the basis for lively class discussions, dramatizations, and original presentations. A minimum average of 85 in Spanish is highly recommended. Students will be expected to complete an interview with instructor prior to admission into the course.

**FUR7/ FUR9 - COLLEGE RUSSIAN**
(5 single periods per week for one year - May be taken as a 5th or 6th Major – Not a Special Permission Course)

Students should have at least an 85 average in Level III Russian or demonstrate native fluency in order to qualify for admission to this college-level course which focuses on an in-depth study of outstanding literary works in Russian.

**FLX1 - ADVANCED PLACEMENT LATIN: VERGIL**
**FLX3 - ADVANCED PLACEMENT LATIN: CATULLUS/OVID**
(5 single periods per week for one year - May be taken as a 5th or 6th Major – Special Permission Required)

This course will follow the syllabus for the Latin Literature: Vergil or Catullus-Ovid Advanced Placement Exam as outlined by The College Board. The aim of this course is in general conformity with college Latin studies in the fourth through sixth semesters and will allow students to apply virtually all of his/her prior studies of Latin morphology, syntax, vocabulary, culture, and word study. The specific objectives of this course, closely related to the AP Curriculum goals, include:

- Develop a highly advanced Latin vocabulary
- Translate literally and poetically continuous passages of original Latin
- Analyze and evaluate original Latin texts
- Appreciate and evaluate original Latin texts within the Western literary tradition
- Study original Latin texts in their specific literary and historic contexts
- Understand and identify rhetorical and literary devices
Identify and scan the meter of original Latin passages

Compare and contrast modern translations of Latin texts

**FT7 - ADVANCED FOURTH YEAR ITALIAN CONVERSATION**

(5 single periods per week for one year - May be taken as a 5th or 6th Major – Not a Special Permission Course)

This course is designed to enhance students' ability in spoken and written Italian. The class will survey Italian literature from the Renaissance period to contemporary times (sonnets of Dante; articles in Italian/American daily newspapers). Award-winning Italian films will be shown to provide the basis for lively class discussions. Audio recordings and Italian music will also be utilized for a complete presentation of Italian dialects and regional accents.

**FE7H / FE9H - HONORS MODERN GREEK LANGUAGE AND LITERATURE**

**FUE1 / FUE 3 - COLLEGE LEVEL GREEK**

(5 single periods per week for one year - May be taken as a 5th or 6th Major – Special Permission Required)

This advanced honors course is open to all students who already speak, read, and write Modern Greek. Students will have the opportunity to study the Greek language through literature, the arts, and the media. Some of the enrichment activities will include field trips, guest speakers, participation in contests, and collaboration with cultural organizations in the Greek community. This course is part of the three-year language sequence requirement for the new advanced Regents diploma. At the completion of this course, students may also take the Greek Regents exam, thus fulfilling the foreign language Regents requirement at Bronx Science.

**FE1H - INTENSIVE MODERN GREEK FOR BEGINNERS**

(5 single periods per week for one year - May be taken as a 5th or 6th Major – Not a Special Permission class)

This intensive introductory course is open to all students who have already completed a three-year sequence in another language and who have taken and passed a language Regents exam. Students may also take this course as a sixth major.

The goals of this class are:

- To develop basic oral and written skills in Modern Greek through the use of texts, videotapes, audio recordings, and computer software
- To build an appreciation and understanding of Hellenic history and culture
- To enhance student performance on standardized exams through the study of word derivations

Some enrichment activities will include field trips, guest speakers, and collaboration with cultural organizations in the Greek community.

A grade of 80 % in a language is required for admission.

**FE3H - FE5H - INTERMEDIATE HONORS MODERN GREEK FOR BEGINNERS**

(5 single periods per week for one year - May be taken as a 5th or 6th Major – Not a Special Permission Class)

This intensive introductory course is a continuation for students who have already taken beginning Modern Greek (FE1H/2H) or the equivalent of one or two years of high school Greek. It can also be a 5th or 6th major for students who have already completed a three-year sequence in another foreign language including in a Regents exam.
**FK3 KOREAN**
(5 single periods per week for one year - May be taken as a 5th or 6th Major – Not a Special Permission Class)
This intermediate level course is designed for students with written, spoken and aural proficiency in the Korean language. Students who have already completed AND PASSED a Regents sequence in another foreign language are able to take this course as a fifth or sixth major. Students will study the language, culture and literature of Korea.

**FK5 KOREAN**
5 single periods per week for one year - May be taken as a 5th or 6th Major – Not a Special Permission class)
This advanced level course is designed for students with written, spoken and aural proficiency in the Korean language. Students who have already completed AND PASSED a Regents sequence in another foreign language are able to take this course as a fifth or sixth major. Students will study the language, culture and literature of Korea.

**NOTE:**
STUDENTS WHO TAKE ADVANCED PLACEMENT COURSES ARE REQUIRED TO TAKE CORRESPONDING AP EXAMS IN MAY.
The ADVANCED PLACEMENT Exam Fee is $83 per exam.
TECHNOLOGY EDUCATION

All students benefit from the application of science, math, problem solving skills and Design principles taught in Technology Education. The department provides experience in the preparation of projects supporting the mission of Bronx Science and develops the technological literacy necessary for competition and success in the world of the applied sciences and engineering.

Sophomore year students take Technical Drawing (except students in Sophomore Research.) You must select “Technical Drawing” when you ‘Naviance’ your sophomore course requests.

In the junior year, students take Science Technology Laboratory. STL students select coursework from a broad range of enticing options providing experimental and project work in specialized areas of interest. Proper instruction on the use of appropriate tools and equipment is provided to facilitate the completion of original projects.

STL SELECTIVE descriptions are provided to help you choose the area of study that best meets your interest and need.

REQUIRED TECHNOLOGY COURSES

TTD1 - TECHNICAL DRAWING
(5 periods per week for 1 year – Required)
Technical drawing is the universal language of science and industry. Technical Drawings are prepared with Computer-Assisted Design (CAD) software and may include the use of manual drafting instruments, when necessary, to complete accurate, professional quality drawings and graphics. Students prepare quality drawings of objects, buildings and machines, and will learn how any presentation can be enhanced with computer generated illustrations.

SCIENCE TECHNIQUES LAB (STL)

The STL requirement is satisfied by any of the STL SELECTIVES below, or through participation in the INTEL Research Program. Research courses may be taken in Biological Science, Physical Science, Mathematics and Social Science. Students who select research must complete a one year course in research and complete an Intel Project. Students who do not complete INTEL Research are required to fulfill the STL requirement by completing one of the STL Selectives listed below. If you are interested in INTEL you are strongly advised to research thoroughly and fully understand the INTEL requirements and commitments. Consult directly with the department in which you are planning your INTEL for complete and accurate information.
STL SELECTIVES

AN IMPORTANT NOTE ABOUT SELECTIVE COURSES
The Program Committee will try to honor student requests for selective courses however another selective course may be substituted by the program committee due to scheduling difficulties, course conflicts or class size limitations.

TEC – TELEVISION PRODUCTION TECHNOLOGY
(5 periods per week for 1 term – satisfies STL Requirement for Graduation)
Students will prepare original video projects using the facilities of The Bronx High School of Science Television Studio. This course teaches the technical, as well as the creative and artistic aspects of producing videos suitable for “broadcast.” Some degree of background knowledge in this field and a most sincere desire to learn the finer points of the planning and editing process is preferred. *The recording of important school events and activities require after school attendance and extended time commitments.*

TRS – TECHNOLOGY OF “STRUCTURES”
(5 periods per week for 1 term – satisfies STL Requirement for Graduation)
This course is recommended for students who are interested in the design and construction of the Built Environment in which we live. Project work applies math and physics to solve engineering problems through the design and construction of various physical structures including bridges, shelters and other elements of the Built Environment. Instruction includes understanding distribution of forces, truss design and alternate construction techniques.

TSM - SCIENCE TECHNOLOGY LAB
(5 periods per week for 1 term – satisfies STL Requirement for Graduation)
Students work on projects and participate in demonstration lessons on techniques of using tools, machines, and materials. Projects made by students are based on and exemplify one or more principles of science, or are to be used as part of an investigation or experiment in some area of science and technology. In the past, students have built a wide range of projects illustrating scientific and engineering principles and they have entered their experimental devices in science fairs, exhibitions and citywide technology contests.

TTC – MARINE TECHNOLOGY
(5 periods per week for 1 term – satisfies STL Requirement for Graduation)
Students will learn the science of marine technology through the design and construction of scale model boats and may participate in the construction of a full-scale vessel. Applications of mathematics, science, history, technical drawing and fabrication technology will combine to provide a rich and unique interdisciplinary lab experience.
TECHNOLOGY EDUCATION ELECTIVES:
The following courses may be taken as a 5th major (2nd elective) or 6th major.
Technology Electives for sophomores, juniors, and seniors are described below.

**TCA1 - COMPUTER TECHNOLOGY**
(5 single periods for 1 year - May be taken as either a 5th or a 6th major)
Build your own Personal Computer in this challenging and innovative class. With readily available components, students will custom build microcomputers of their own design. Students will learn digital electronics, mechanical assembly, troubleshooting, diagnostics, and will become proficient in maintaining, their machines. The completed systems may be housed in custom-made desktop consoles also designed and built by the students. Students will obtain training and experience similar to the industry-standard “A+”. **Students are responsible for all expenses related to the assembly and completion of their computer.**

**TCA5 - INTERNETWORKING**
(5 single periods per week for 1 year - May be taken as either a 5th or a 6th major)
Students study the Internet, focusing on web page design. Students develop projects that involve network servers, the World Wide Web, and other Internet related activities. Topics covered include HTML Programming, Web Servers, Advanced HTML Programming, Graphics Editing, Introduction to JAVA and Animations. Students participate in class discussions, demonstrations, and research. Term projects are required.

**TCG1 - COMPUTER GRAPHICS**
(5 periods per week for 1 year - May be taken as either a 5th or a 6th major)
Computer-generated art is one of the fastest growing segments of the computer field. Fine arts, publishing, business, advertising, television and film production are areas increasingly in need of people with a scientific background coupled with graphics training. This course will develop skills in using the computer as a creative art tool. It will also make students aware of the growing career potential of computer graphics industry. Students will have hands-on experience in our modern graphics lab, to creating, capturing, modifying, and then printing their original work. Outstanding work can be displayed in exhibits and shows, or on the “web”.

**TCM1 - ROBOTICS TECHNOLOGY**
(5 periods per week for 1 year - May be taken as either a 5th or a 6th major)
This course encourages creativity and celebrates ingenious solutions to engineering and mechanical problems through design and construction of purpose-built computer controlled devices and ROBOTS! Science and Engineering are partnered with design and construction enabling students to realize and experience the satisfaction of solving challenging, practical problems.
TDA1 - ARCHITECTURAL DRAFTING
(5 periods per week for 1 year - May be taken as either a 5th or a 6th major)
This one-year course is recommended for future architects, designers, civil engineers, and other interested students who wish to explore the design of various structures such as homes, utility buildings, industrial facilities, and other public spaces. Students may prepare models and design solutions for the various problems encountered when planning private houses, apartments, schools, and municipal buildings. The class uses manual drawing and COMPUTER AIDED DESIGN for the preparation of plans and elevations.

TPE1 - PRINCIPLES OF ENGINEERING
(5 single periods per week for 1 year - May be taken as either a 5th or a 6th major)
This course is taught in a laboratory setting providing access to tools and materials for individual, small-group, and large-group projects. The major engineering concepts to be developed are systems, modeling, the responsible interaction of technology and society, and mechanical design. This exciting course will be a particular asset to those students who intend to major in the field of or pursue a career in engineering.

ELECTIVE MINORS IN TECHNOLOGY
NOT A 5TH OR 6TH MAJOR

TCA7 - ADVANCED INTERNETWORKING
(5 single periods per week for 1 year – Special Permission Required - Elective Minor Only – May NOT be taken as a 5th or 6th Major)
Students develop independent Internet related projects that involve cutting edge technologies. Students select topics such as UNIX SYSTEM administration, JAVA Programming, advanced HTML Programming, Windows NT installation and administration, Linux installation and administration, Web Master Administration. Significant time outside the regular school day is required. Students are required to submit weekly logs of activities and meet regularly with the teacher to discuss the project. Independent research is required.
VISUAL ARTS

Our program of fine arts and visual communication is designed to help students develop their creative ability and talent while simultaneously understanding those factors in our culture that add beauty, stimulation, and enrichment to our lives. The arts engage a student's imagination, ideas, and abilities, and inspire them to more richly appreciate the world around them.

REQUIRED ART COURSE

A10 – STUDIO IN ART (ART APPRECIATION)
(5 periods per week for 1 term – Required for Freshman)
Studio in Art is required of all students. It is usually taken in the freshman year for one term. Students develop an appreciation of visual art through experimentation with a variety of media, in both two-and three-dimensional forms. They are exposed to the rewards of seeing the elements and principles of Art evolve into an attractive and creative finished product.

ELECTIVE ART COURSES
(One year, 5th or 6th Majors)

ACP1 – PHOTOGRAPHY
(5 periods per week for 1 year - Special Permission Course)
The emphasis of this class is on digital image capture, editing and manipulation. 35 mm film cameras may also be used in conjunction with a scanner. Students are given creative assignments inspired by the work of well-known photographers. They use professional software to improve, modify or combine the work with other pieces. The elements and principles of art are explored through the preparation of “electronic” images. Completed projects may become part of Gallery exhibits or other public displays.
Prerequisite: Art Appreciation or 8th grade accelerated art, excellent grades and attendance. Lab fee applies.

ADD1 – STUDIO IN DRAWING AND DESIGN
(5 periods per week for 1 year – Prerequisite: Art Appreciation or 8th grade accelerated art)
Students will prepare artwork to acquire fundamental drawing skills, which will allow them to communicate their ideas visually. By exploring the expressive possibilities of different materials and techniques, students will gain an understanding of the creative process, an appreciation of art, and develop their own problem-solving skills.

APP1 – STUDIO IN PAINTING
(5 periods per week for 1 year – Prerequisite: Art Appreciation or 8th grade accelerated art)
This course will help students find their own unique approach for artistic expression through the use of paint. Students will also develop a vocabulary for intelligently discussing and critiquing art. Through various projects students will develop painting techniques, improve their visual perception, and learn about their own work in the context of art history. Students will experiment with a variety of styles and paint from both life experience and imagination. This course will also assist in the development of a high quality art portfolio.
Prerequisite: Art Appreciation or 8th grade accelerated art. Lab fee applies.
**ADS1 – STUDIO IN SCULPTURE**  
(5 periods per week for 1 year - Prerequisite: Art Appreciation or 8th grade accelerated art.)  
This course focuses on self-expression through three-dimensional design. The course offers both aesthetic and technical experiences so that students will be able to understand, appreciate, and express themselves in a variety of media. The objectives of this course are to develop perceptual and aesthetic sensitivity and an appreciation and understanding of three-dimensional form.  
Prerequisite: Art Appreciation or 8th grade accelerated art. Lab fee applies.

**ADVANCED PLACEMENT COURSES in ART**

**IMPORTANT NOTE:** STUDENTS WHO TAKE ADVANCED PLACEMENT (AP) COURSES ARE REQUIRED TO TAKE CORRESPONDING AP EXAMS IN MAY. Payment of the AP Exam Fee is mandatory.

**AUX1 – ADVANCED PLACEMENT STUDIO ART**  
(5 periods per week for 1 year – Special Permission Required - May be a 5th or 6th major)  
The Advanced Placement Program in Studio Art is for talented and highly motivated students interested in the study of art technique and/or the pursuit of a career in art. Students will be called upon to devote considerable time and maximum effort, far beyond a typical high school course, in the quest to produce works of the highest aesthetic quality. Students must leave sufficient time for independent study, outside of school. Students will be required to develop a portfolio to be evaluated by the College Board. Determination of AP credit will follow standard College Board evaluation procedures.

**AUX3 - ADVANCED PLACEMENT ART HISTORY**  
(5 periods per week for 1 year – Special Permission Required – May be a 5th or 6th major)  
Students will study fine works of art in relation to the period in which the works were produced. It is important that the student is interested in college-level study and is willing to devote maximum time and effort to the study of art history. The production of written analyses and research papers, as well as visits to museums and galleries will be required. Determination of AP credit will follow standard College Board evaluation procedures.  
Prerequisite: Art Appreciation or 8th grade accelerated art. Lab fee applies
MUSIC

Music instruction is divided into two categories: Music Appreciation and Performing Music. Music Appreciation is a one-term class and Performing Music is a full-year commitment. There are five Performing Music groups, as described below.

REQUIRED MUSIC COURSE

U1R - MUSIC APPRECIATION
(5 periods per week for 1 term)
The required course in MUSIC APPRECIATION, usually taken in the freshman year, explores the value of music for the individual as an educated member of society. Students survey the history of music and learn how to listen to outstanding and significant musical styles, periods, and composers. Students are taught to analyze various works, both objectively and subjectively, while common threads and interrelationships are developed.

PERFORMING MUSIC COURSES

All students may apply for admission to Performing Music classes.

IMPORTANT NOTES:
- AUDITIONS ARE REQUIRED
- These courses satisfy the music requirement for graduation.
- Students may remain in performing music for four years.
- These courses are elective minors. They may be taken as an extra class.

Performances may include music assemblies, winter and spring concerts, graduation and festival appearances that often take place after school and possibly on weekends or evenings.

UDC1 - CONCERT BAND
5 periods per week for 1 year. Audition Required. Elective Minor – NOT a 5th Major
This group, a major showcase group, consists of full band instrumentation and has a large repertoire. The Concert Band has a full sound that must be heard to be believed. Their repertoire may include classical, popular, rock, movie, TV, holiday marches, and show tunes. Audition and performance commitments are required.

UDT1 - STAGE BAND
5 periods per week for 1 year. Audition Required. Elective Minor – NOT a 5th Major
Jazz, the distinctly American musical idiom, in its many forms and varieties, is the essential element in Stage Band performance. This band plays selections from the 30s, 40s and 50s "Big Band" era right through the 90s. Audition and performance commitments are required.
**UMN1 - SMALL ENSEMBLE**
5 periods per week for 1 year. Audition Required. Elective Minor – NOT a 5th Major
This class is designed for the advanced music student. A student enrolled in this class is expected to work independently, form their own group and develop their own repertoire. Audition and performance commitment are required. Ensembles can include a rock band, chamber group, folk group, fusion or other acceptable music style.

**UMR1 – ORCHESTRA**
5 periods per week for 1 year. Audition Required. Elective Minor – NOT a 5th Major
This is the basic instrumental program for students who desire the experience of learning and performing symphonic music. Open to all students by audition. Members consist of the most talented string, wind, and percussion players.

**UVE1 – CHORUS**
5 periods per week for 1 year. Audition Required. Elective Minor – NOT a 5th Major
Chorus is for students with the interest and ability to sing. The joys and personal satisfaction of trained group singing are available to all students who have the desire to sing. The Bronx Science Chorus studies and performs classical, jazz gospel and popular selections and stages many fine performances which include a full range of musical selections. Performance commitments, audition, and approval of choral director are required.
THE HEALTH AND PHYSICAL EDUCATION DEPARTMENT

It is through movement that we as humans are connected to our environment. Our physical bodies are what enable us to fulfill our dreams and attain our goals. It is therefore our obligation to maintain the highest level of physical fitness possible.

It is apparent that we are living in a society that does not provide for adequate physical activity and thus it is our duty to lead our students in preparation for life-long physical activities and good physical and emotional health. By establishing a program that provides a wide range of activities, we are making it possible for our youth to incorporate some of these fun activities into a future of lifetime exercise.

Our department’s goal is to provide the necessary knowledge and skills to establish and maintain physical fitness, active participation in physical activity, and maintain good personal health. These goals will be imparted in ways that promote enjoyment as well as provide for a competitive atmosphere that will benefit all students.

We also offer an extensive, all-inclusive course in health education. Emphasis is placed on physical and mental health, sex education and human reproduction, drugs, tobacco and alcohol, communicable and non-communicable diseases.

As part of our physical education curriculum, we offer the following selective classes:

<table>
<thead>
<tr>
<th>Aerobics</th>
<th>Flag Football</th>
<th>Volleyball</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basketball</td>
<td>Gymnastics</td>
<td>Weight Training</td>
</tr>
<tr>
<td>Baseball</td>
<td>In-Line Skating</td>
<td>Yoga</td>
</tr>
<tr>
<td>Fitness</td>
<td>Soccer</td>
<td></td>
</tr>
</tbody>
</table>

When we are able to give students their first choices we do, we know that they are more receptive, more successful and will also enjoy themselves. We encourage the selection of various course offerings along with a wide variety of Varsity and Jr. Varsity sports that are available throughout the year.

Students may join the following athletic teams available at Bronx Science:

- Baseball Varsity & Jr. Varsity
- Basketball Varsity & Jr. Varsity (Boys & Girls)
- Bowling Coed
- Crew Coed
- Cross Country Boys and Girls
- Fencing Coed
- Golf Boys & Girls
- Outdoor Track Boys and Girls

- Gymnastics Boys & Girls
- Handball Boys & Girls
- Indoor Track Boys & Girls
- Soccer Boys and Girls
- Swimming Boys and Girls
- Tennis Boys and Girls
- Volleyball Boys
- Volleyball Varsity Boys
- Volleyball Varsity and Jr. Varsity Girls
- Softball Girls Varsity & Jr. Varsity
GUIDANCE DEPARTMENT

ELECTIVE MINOR IN GUIDANCE

GL7-Methods in Conflict Resolution—Fight or Flight: Are Either Ever Right?
(5 periods per week for one year—Not Special Permission. Elective Minor--not a 5th major.)

Conflict is inevitable. We experience it within ourselves, our families, our schools, our neighborhoods and our communities. How can we use conflict as an opportunity for reflection, discussion, growth, respect and resolution? Anger is a natural response to either experiencing or witnessing an injustice. How can we use our anger to affect change without resorting to abusive, violent, destructive or self-sabotaging behavior? In this class, these questions are among the many that will be viewed through the lens of students’ personal experiences, discussions, literature, periodicals, newspapers, documentaries, film, plays and poetry. Students will question how fear, ignorance, intolerance, perceptions and assumptions, prejudice, stereotyping, discrimination, ignorance, cultural diversity, limited resources, unmet basic needs and opposing values can lead to conflict.

Participants will be encouraged to find their own voice to challenge intolerance, discrimination and violence. Models of effective communication will be presented and reinforced using video tapes and role-playing. The course is designed to develop students’ leadership qualities, hone their communication skills, deepen their understanding of themselves and others and acquire and practice mediation skills so they can become informed and active “peace-makers” in the Bronx Science community.
### GRADUATION REQUIREMENTS

STUDENTS MUST TAKE AND PASS 5 MAJORS EACH TERM.

The minimum requirements are listed below. Students may take additional courses.

<table>
<thead>
<tr>
<th>Course</th>
<th>Requirement</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>every term at Bronx Science</td>
</tr>
<tr>
<td>Social Studies</td>
<td>every term at Bronx Science</td>
</tr>
<tr>
<td>Laboratory Science</td>
<td>every term at Bronx Science</td>
</tr>
<tr>
<td></td>
<td>(Every student must take at least one biology</td>
</tr>
<tr>
<td></td>
<td>course at Bronx Science. If a student took</td>
</tr>
<tr>
<td></td>
<td>biology in Junior HS, s/he must take a biology</td>
</tr>
<tr>
<td></td>
<td>course in junior year.)</td>
</tr>
<tr>
<td>Mathematics</td>
<td>six terms at Bronx Science</td>
</tr>
<tr>
<td>Foreign Language</td>
<td>six terms (four terms at Bronx Science)</td>
</tr>
<tr>
<td>Technical Drawing or</td>
<td></td>
</tr>
<tr>
<td>Sophomore Research</td>
<td>two terms</td>
</tr>
<tr>
<td>Art Appreciation</td>
<td>one term</td>
</tr>
<tr>
<td>Music Appreciation</td>
<td>one term (or two terms performing music)</td>
</tr>
<tr>
<td>STL</td>
<td>one term (or two terms of Intel projects)</td>
</tr>
<tr>
<td>Health</td>
<td>one term</td>
</tr>
<tr>
<td>Physical Education</td>
<td>eight terms</td>
</tr>
<tr>
<td>Elective 1</td>
<td>two terms (Science or Math)</td>
</tr>
<tr>
<td>Elective 2</td>
<td>two terms (Any 5th major)</td>
</tr>
</tbody>
</table>

Regents must be passed in English, Global History, U.S. History, Biology, Chemistry, Physics, Math A and Math B and Foreign Language.

TRANSCRIPT CHECK: Students should check that all exams and appropriate course credit are recorded on their transcript.

Students, who fail History 7, History 8 or any term of English must repeat each term failed. Students who fail either the first or second term of any subject must attend summer school. You cannot receive credit for an academic class twice.
Every student entering the senior class must enroll in the following courses for their senior year:

- English
- Social Studies
- Lab Science
- Elective 1 - A science or a math course
- Elective 2 - Any fifth major **See below for elaboration.
- Physical Education

**The following classes are NOT fifth majors:

- Debate
- Yearbook
- Journalism
- Theatre Workshop
- Advanced Acting and Play Production
- Drama Workshop
- Advanced Internetworking
- Musical Group
- any course listed as a “sixth major only” or “elective minor”
# PROGRAM PLANNING GUIDELINES

<table>
<thead>
<tr>
<th>Freshman Program</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td><strong>Spring</strong></td>
</tr>
<tr>
<td>1 English</td>
<td>English</td>
</tr>
<tr>
<td>2 Social Studies</td>
<td>Social Studies</td>
</tr>
<tr>
<td>3 Mathematics</td>
<td>Mathematics</td>
</tr>
<tr>
<td>4 Lab Science</td>
<td>Lab Science</td>
</tr>
<tr>
<td>5 Foreign Language</td>
<td>Foreign Language</td>
</tr>
<tr>
<td>6 Art Appreciation/ Music Appreciation or Performing Music</td>
<td>Art Appreciation/Music Appreciation or Performing Music</td>
</tr>
<tr>
<td>7 Physical Education</td>
<td>Physical Education</td>
</tr>
<tr>
<td>8 Research Literacy or Writing Workshop*</td>
<td>Research Literacy or Writing Workshop*</td>
</tr>
<tr>
<td>9 Lunch</td>
<td>Lunch</td>
</tr>
</tbody>
</table>

Students who participate in Performing Music (Band, Chorus, Orchestra etc...) will take Art Appreciation in the Sophomore or Junior Year. It is also suggested that these students take Art Appreciation in summer school if at all possible.

* Students enrolled in Honors Science have a double period of Science and are exempted from the Research Literacy and Writing Workshop requirements.

<table>
<thead>
<tr>
<th>Sophomore Program</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Fall</strong></td>
<td><strong>Spring</strong></td>
</tr>
<tr>
<td>1 English</td>
<td>English</td>
</tr>
<tr>
<td>2 Social Studies</td>
<td>Social Studies</td>
</tr>
<tr>
<td>3 Mathematics</td>
<td>Mathematics</td>
</tr>
<tr>
<td>4 Lab Science</td>
<td>Lab Science</td>
</tr>
<tr>
<td>5 Foreign Language</td>
<td>Foreign Language</td>
</tr>
<tr>
<td>6 Technical Drawing or Sophomore Research (research counts as a 6th major.)</td>
<td>Technical Drawing or Sophomore Research (research counts as a 6th major.)</td>
</tr>
<tr>
<td>7 Physical Education</td>
<td>Physical Education</td>
</tr>
<tr>
<td>8 Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td>9 6th Major (optional) You may not take a 6th major if you’re taking Sophomore Research.</td>
<td>6th Major (optional) You may not take a 6th major if you’re taking Sophomore Research.</td>
</tr>
</tbody>
</table>
## Junior Program

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>English</td>
<td>English</td>
</tr>
<tr>
<td>2</td>
<td>Social Studies</td>
<td>Social Studies</td>
</tr>
<tr>
<td>3</td>
<td>Mathematics</td>
<td>Mathematics</td>
</tr>
<tr>
<td>4</td>
<td>Lab Science (usually Physics)</td>
<td>Lab Science (usually Physics)</td>
</tr>
<tr>
<td>5</td>
<td>Foreign Language or any 5th major elective</td>
<td>Foreign Language or any 5th major elective</td>
</tr>
<tr>
<td>6</td>
<td>STL or Projects</td>
<td>Health</td>
</tr>
<tr>
<td>7</td>
<td>Physical Education</td>
<td>Physical Education</td>
</tr>
<tr>
<td>8</td>
<td>Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td>9</td>
<td>6TH Major (optional)</td>
<td>6TH Major (optional)</td>
</tr>
</tbody>
</table>

## Senior Program

<table>
<thead>
<tr>
<th></th>
<th>Fall</th>
<th>Spring</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>English</td>
<td>English</td>
</tr>
<tr>
<td>2</td>
<td>Social Studies</td>
<td>Social Studies</td>
</tr>
<tr>
<td>3</td>
<td>Lab Science</td>
<td>Lab Science</td>
</tr>
<tr>
<td>4</td>
<td>Science or Mathematics (Elective 1)</td>
<td>Science or Mathematics (Elective 1)</td>
</tr>
<tr>
<td>5</td>
<td>Fifth Major (Elective 2)</td>
<td>Fifth Major (Elective 2)</td>
</tr>
<tr>
<td>6</td>
<td>Physical Education</td>
<td>Physical Education</td>
</tr>
<tr>
<td>7</td>
<td>Lunch</td>
<td>Lunch</td>
</tr>
<tr>
<td>8</td>
<td>6TH Major (optional)*</td>
<td>6TH Major (optional)*</td>
</tr>
</tbody>
</table>

*6th major is optional if all requirements have been met (make-up classes are not 6th majors).
NOTE:
1. Students who have not passed E1, 2, 3, & 4 AND H1, 2, 3, & 4 will not be promoted into grade 11.
2. You cannot advance in major subjects, technical drawing or physical education in summer school.
3. All courses you have not passed MUST be completed in Bronx Science summer school immediately.
4. Students may advance in Art, Music, STL, and Health in Bronx Science summer school. Students who are “making-up” a course are advised to fill in required minors during the summer.
5. Requests for a sixth major will be added to your program only if the budget permits and subject to your attendance and cut records.
6. Accelerated course grades, Regents grades, and proficiency exam grades should appear on your transcript. If they do not, please see your Guidance Counselor.
7. Seniors’ 1st elective choice (4th major) must be a science or math course.
8. Seniors’ 2nd elective choice (5th major) may be any academic course including, Advanced Placement courses or any other course that is NOT designated as either a “sixth major only” or as an “elective minor.”
9. Students who failed a major class and do not attend summer school MUST take six majors the following year (the make-up class does NOT count as one of the five majors).
10. Entering sophomores: If you did not take a basic science (Bio, Chemistry or Physics) as a freshman you must take this class in senior year. This science will fulfill both the 2nd elective and basic science requirement. All students also must take a lab science (Elective 1). If you must also complete a three-year language sequence you must also schedule that course.
11. You must meet with your guidance counselor at least once a year to review your transcript and to confirm that you are fulfilling your graduation requirements in a timely manner.

GRADUATION PLANNING SHEET
The chart below will help you to plan next term’s schedule. Check those courses that you have already passed. In the appropriate column, write the codes for the courses that you are planning to take next year. Cross out all courses that do not apply to you. Remember that you must take at least 5 majors per term. If you have any questions, see the department supervisor or your guidance counselor. Not all students will need every course listed in the first column. NOTE: Seniors must have one “elective 1” and one “elective 2.” A “+” indicates year a course is usually taken. “++” = the year a course is often taken.
<table>
<thead>
<tr>
<th>Courses needed to Graduate</th>
<th>Already Passed</th>
<th>Freshman Year</th>
<th>Sophomore Year</th>
<th>Junior Year</th>
<th>Senior Year</th>
<th>Summer School</th>
</tr>
</thead>
<tbody>
<tr>
<td>English 1 / 2</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English 3 / 4</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English 5 / 6</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English 7 / 8</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global History 1 / 2</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Global History 3 / 4</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History 5 / 6</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History 7</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economics 8</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History 4th Year</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Biology</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senior LAB SCIENCE</td>
<td></td>
<td></td>
<td>+</td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language 1 / 2</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language 3 / 4</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Language 5/6</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Advanced Language (May Be Used As Elective 2)</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math Year 1</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math Year 2</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Math Year 3</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective 1</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Elective 2</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Drawing Or Research</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>STL Or Intel Projects</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Music</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Art</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Research Literacy</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Education (Gym)1/2</td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Education (Gym)3/4</td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Education (Gym)5/6</td>
<td></td>
<td>+</td>
<td></td>
<td>+</td>
<td>++</td>
<td></td>
</tr>
<tr>
<td>Physical Education (Gym)7/8</td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health Education</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+</td>
<td></td>
</tr>
</tbody>
</table>
Fill in the form below to prepare for elective day and Course Selection Day

Name ________________________________ Official Class ________________

ID# ___   ___   ___      ___   ___   ___       ___   ___   ___

Counselor ____________________________

NOTES

Special Permission courses I’d like to take: (Be sure to sign up!)
_____________________________
_____________________________
_____________________________

Courses to visit on Elective Day (Note room numbers)
_____________________________ ___________
_____________________________ ___________
_____________________________ ___________

My Five majors (1st choice)       My Five majors (1st Alternate)
1. _______________________ _______________________
2. _______________________ _______________________
3. _______________________ _______________________
4. _______________________ _______________________
5. _______________________ _______________________

My Five majors (2nd Alternate) My Five majors (3rd Alternate)
1. _______________________ _______________________
2. _______________________ _______________________
3. _______________________ _______________________
4. _______________________ _______________________
5. _______________________ _______________________

Sixth major, extra course (if necessary) or elective minor
6. _______________________ _______________________
7. _______________________ _______________________

- 59 -
ON-LINE ELECTRONIC COURSE CATALOG

An electronic copy of the Course Catalog has been posted on The Bronx Science World Wide Web page, www.bxscience.edu.

Questions related to the Course Catalog on the Internet should be directed to the appropriate department or Ms. Chang, Coordinator of Pupil Personnel Services via surface mail or via E-Mail to chang1@bxscience.edu.

This guide was paid for by a grant from:

<table>
<thead>
<tr>
<th>The Parents Association</th>
</tr>
</thead>
<tbody>
<tr>
<td>Of</td>
</tr>
<tr>
<td>The Bronx High School of Science</td>
</tr>
<tr>
<td>75West 205th Street</td>
</tr>
<tr>
<td>Bronx, NY 10468</td>
</tr>
<tr>
<td>718-817-7739</td>
</tr>
</tbody>
</table>