

SCHOOL OF SCIENCE COURSE THE BRONX HIGH SCHOOL  
OF SCIENCE THE BRONX HIGH SCHOOL OF SCIENCE COURSE CATALOG 2004

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The Bronx High School of Science  
75 West 205 Street  
Bronx, New York 10468

Valerie Reidy  
Principal

Course Guide  
for  
School Year 2004-05

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## **DIRECTORY OF ADMINISTRATORS**

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<b><u>ASSISTANT PRINCIPALS ADMINISTRATION</u></b>		
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Stephen Kalin	Assistant Principal Management Information Systems	Room 134
Linda Weissman	Assistant Principal Organization	Room 135
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Jean Donahue	Coordinator Biological Science Department	Room 329D
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Annelisse Falzone	Coordinator Physical Science Department	Room 231D
Fred Levy	Assistant Principal Technology, Music and Art Departments	Room 315D
Harold Rattien	Assistant Principal I.A. Mathematics Department	Room 107D
Lisa Rocchio	Assistant Principal I.A. Foreign Language	Room 214D
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# **THE ENGLISH DEPARTMENT**

## **FRESHMAN ENGLISH CLASSES**

Open To Incoming Freshmen

### **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**

Open to Current Freshman

### **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 provides instruction from the Sophomore English curriculum as well as instruction in debate and public speaking. Students read Shakespeare's *The Tempest*, Charles Dickens' *A Tale of Two Cities*, George Orwell's *1984*, Toni Morrison's *The Bluest Eye*, and Aldous Huxley's *Brave New World*. 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. Students study vocabulary, grammar, and test-taking techniques for the PSAT and SAT. 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.

### **E3OH – Advanced 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.

## **JUNIOR ENGLISH CLASSES**

Current sophomores must take one of the E5 classes listed below in their junior year.

### **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.

## **Junior Honors English Classes**

### **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. It includes training in critical reading, thinking, and expository writing. Opportunities to do creative writing are 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, etc. 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 newsrooms 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**

Current juniors and sophomores who have completed E5 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 \$82 Per exam.

## **SENIOR SELECTIVES IN ENGLISH**

**What is a Selective Course?** Selective courses satisfy a requirement (such as the senior English requirement below) but emphasize a particular aspect of the subject area. All Selectives cover the same English 7 curriculum. The following courses fulfill the Senior English Requirement.

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)

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 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)

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 includes preparation for the college essay, and 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.

## **COURSES OPEN TO ACCELERATED STUDENTS ONLY**

Students who are currently in E8 must take E9 in the senior year.

**The following three options are available to students who took E7/E8 in the Junior year:**

### **E9L – INTRODUCTION TO COLLEGE-LEVEL ENGLISH SKILLS**

(5 periods per week for 1 year – - Not a Special Permission Course, OPEN TO ACCELERATED STUDENTS ONLY)

This course will explore the habits and skills of writing about literature and of analyzing literature that will help students succeed on the college level. The study of composition will also be emphasized. Classical and modern literature will be read. It will encompass texts that are not a part of the required senior level English syllabus. Masterpieces of British, American and World literature (including poetry, plays, novels and fiction) from the Anglo-Saxon period through the twentieth century will be read. Texts may include *Beowulf*, Sei Shonagon's *The Pillow Book*, Sir Gawain and the Green Knight, Miguel Cervantes' *Don Quixote*, Jorge Luis Borges' *Ficciones*, and Gabriel Garcia Marquez's *One Hundred Years of Solitude*. The class

will also explore literary theory, cultural history and literary criticism. This course will provide students with the kind of challenging college-level reading, writing, and research skills that broaden and develop critical thinking.

### **E9P – Inner Visions: Poetry and the Creative Process**

(5 periods per week for 1 year - Not a Special Permission Course OPEN TO ACCELERATED STUDENTS ONLY)  
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 poems 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 students' appreciation of poetry through exposure to Canonical poets, and to strengthen critical skills necessary to understand and evaluate poetry on the college level.

### **E9S – SHAKESPEARE: BEHIND THE SCENES**

(5 periods per week for 1 year - Not a Special Permission Course, OPEN TO ACCELERATED STUDENTS ONLY)  
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.

### **THE FOLLOWING COURSES MAY BE TAKEN AS 5th or 6<sup>th</sup> 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 poems 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 students' 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, OPEN TO ACCELERATED STUDENTS ONLY )

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**

**What is a Sixth Major Course?** SIXTH MAJORS, in addition to regularly required English, are courses with their own especially designed workshop type of setting. If you wish to take a sixth major, you must also take a regular English class. Sixth majors are offered by the English Department but do not take the place of the required English course.

THE FOLLOWING COURSES MAY BE TAKEN IN ADDITION TO REQUIRED ENGLISH

### **EC1\* – Bronx Science Forensics Team Workshop**

(5 periods per week for 1 year - Special Permission Required - 6<sup>th</sup> 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 and Debate**

(5 periods per week for 1 year - Special Permission Required - 6<sup>th</sup> major only)

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 – 6<sup>th</sup> 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 – 6<sup>th</sup> 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 – 6<sup>th</sup> 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 – (Offered 9<sup>th</sup> and 10<sup>th</sup> Period)- Special Permission Required – 6<sup>th</sup> 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 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.**

#### **H1X Advanced Placement World History**

(5 periods per week for 1 year – Not a Special Permission Course – may be substituted for H\$1)

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 materials. 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 - Special Permission Required)

This is the continuation of the two-year Advanced Placement World History course. All freshmen currently in Advanced Placement World History must take the second year of the course.

### **HBD\* - INTRODUCTION TO SOCIAL SCIENCE PROBLEM SOLVING**

(5 periods per week for 1 year – Special Permission Required - *6<sup>th</sup> major only*)

This sophomore level elective course is designed to identify specific social science problems and to make use of computer technology in developing approaches to resolving these problems. Computer data analysis software is used in the problem solving process. Students collect data, graph it appropriately and conduct statistical analysis. Both on-line and hard copy scientific library research techniques are used. The history of groundbreaking research and the techniques of great social scientists will be explored. Students work in small groups to perform model experiments and to design and carry out their own research. Students who successfully complete this course fulfill the requirement for TTD1 – Basic Technical Drawing.

## **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.

## **JUNIOR ADVANCED PLACEMENT COURSES**

### **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. 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.

### **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 A.P. 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.

### **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 alot To tell you the truth, I never worked so hard on something in my life, and I neverenjoyed something that I worked hard at so much."*

## **SENIOR SOCIAL STUDIES COURSES**

Any of the following H7classes will fulfill the senior Social Studies requirement.

### **ADVANCED PLACEMENT CLASSES**

#### **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 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.

#### **H7X7 – ADVANCED PLACEMENT MACROECONOMICS**

(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.

### **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

### **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 20<sup>th</sup> 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.

### **H7C – INTRODUCTION TO CONSTITUTIONAL LAW**

(5 periods per week for 1 year – Not a Special Permission Course)

This senior course satisfies the H7/H8 graduation requirement. The Constitution and its Bill of Rights have guided our nation for over two centuries. This course offers the student who is willing to do serious college level work, a lively opportunity to better understand our basic rights and the Supreme Court which interprets them. By analyzing and debating both historic and recent major court decisions, the student will better understand the controversies surrounding freedoms of speech, press, religion, privacy and abortion, as well as questions of racial equality, affirmative action, student rights and the power of the state in general.

The course will incorporate a unit on Economics. The highlight of the class is a three-day, two-night trip to Washington, D.C. On this trip the student will come to understand first hand how the Court works by attending oral arguments in the Supreme Court as well as by meeting with attorneys, reporters, law clerks, and a Supreme Court Justice.

### **H7E –THE PRINCIPLES OF ECONOMICS & FINANCE**

(5 periods per week for 1 year – Not a Special Permission Course)

This senior course satisfies the H7/H8 graduation requirement. The course is designed for students whose interest is in business, finance, or the social sciences. The course telescopes

the Participation in Government section and expands the economics section. The emphasis of this course is an introduction to various forms of applied economics, for students who expect to study economics or business in college. This course provides more freedom than the Advanced Placement course, so that the individual interests of the class may be explored, and the focus of the course can be responsive to current economic and political events. The goal is to provide enrichment in economics for serious students and to go beyond simple economic literacy. The public policy inquiry will reflect upon contemporary issues and will focus on the political aspects of the formation of fiscal and monetary policy.

A major component of this selective will be participation in the Stock Market Game, a group-based, citywide stock market simulation. Each student will complete an individual project or paper related to the Stock Market Game, for his or her term project.

### **H7L -- MOOT COURT**

(5 periods per week for 1 year – Not a Special Permission Course)

This senior course satisfies the H7/H8 graduation requirement. Moot Court will be integrated into the Participation in Government curriculum. Specifically, students will learn legal research, how to read Supreme Court cases and will prepare and give a legal argument before a panel of judges. Students will then be selected to compete in a court competition by giving their oral presentation first to a panel at Fordham Law and, if successful, will compete before Federal Judges in Manhattan.

### **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 (5<sup>th</sup> or 6<sup>th</sup> 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.

- HRX5 -Advanced Placement European History
- HRX3-Advanced Placement World History
- HRF1-Introduction to Film Studies

### **HRX3 - ADVANCED PLACEMENT WORLD HISTORY**

(5 periods per week for 1 year - Special Permission Required – May be taken as a 5<sup>th</sup> or 6<sup>th</sup> Major).

This course goes beyond regents-level Global History. Advanced Placement World History will cover key historical developments with a particular emphasis on overarching themes including the impact of interaction among major societies, the relationship of change and continuity, the impact of technology and demography, systems of social structure and gender structure, cultural and intellectual developments, and changes in functions and structures of states. All students accepted into the course are required to take the Advanced Placement Examination in May.

### **HRX5 – ADVANCED PLACEMENT EUROPEAN HISTORY for JUNIORS AND SENIORS**

(5 periods per week for 1 year - Special Permission Required – May be taken as a 5<sup>th</sup> or 6<sup>th</sup> Major).

This course will survey Western civilization from the Renaissance through the collapse of Communism and the rise of the European Union. The course will emphasize Western intellectual history and be conducted as a seminar (emphasis on discussion). Requirements for

admission: Minimum 85 average in Social Studies. Students must complete an application form and submit copies of their latest transcript. All students accepted into the course are required to take the Advanced Placement Examination in May.

### **HRF1 – HISTORY OF AMERICAN CINEMA**

(5 periods per week for 1 year – Not a Special Permission Course)

Modeled on introductory college film courses, this course traces the development of American film from its inception to the present. Students will study the technical elements of film and how they contribute to a complete work. Emphasis is placed on the relationship between film and social, economic, political and cultural developments. Attempts will be made to determine the relationship between the Hollywood dream and America's reality and the impact of film in issues of race, gender, violence, crime, education and government policy. The impact of "celebrity" and star system will also be examined. The first semester will cover American films through 1945. The second semester will cover the period 1945 to the present with an emphasis on the films of the 1960s and 1970s. Among the films considered for viewing as clips or in their entirety: *Public Enemy*; *Scarface* (the original), *Bringing Up Baby*; *Casablanca*; *On the Waterfront*; *Godfather I and II*; *Bonnie and Clyde*; *Psycho*; *Full Metal Jacket*; and *Dr. Strangelove*

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

THE FOLLOWING COURSES MAY BE TAKEN:

- As a 5<sup>th</sup> or 6<sup>th</sup> 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, HRX3, & 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.

## **SOCIAL STUDIES ELECTIVE MINORS:**

### **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.

### **HUP1 – SOCIAL SCIENCE RESEARCH PROJECTS**

(5 periods per week for 1 year - Special Permission Required. – Not a 5<sup>th</sup> or 6<sup>th</sup> Major, this course is an Elective minor and must be taken with another Social Studies course.)

This class offers students the opportunity to do independent behavioral research in political science, behavioral science, economics, sociology, or psychology. Students explore contemporary problems involving the structure of society, the patterns of human behavior, and the forces that bring about social change. Students will have the opportunity to work with outside professional researchers. Admission to this course is based on the student's interest in social problems, intellectual curiosity and ability and willingness to do organized and sustained research. Papers will be submitted to the Intel National Science Talent Search. This class is open to juniors and may only be taken as a second social studies course.

#### **NOTE:**

STUDENTS WHO TAKE ADVANCED PLACEMENT COURSES *ARE REQUIRED TO TAKE* CORRESPONDING AP EXAMS IN MAY.

The ADVANCED PLACEMENT Exam Fee is \$82 Per exam.

## **THE MATHEMATICS DEPARTMENT**

Mathematics is important to every student. It teaches logic, inference, critical thinking, techniques of analysis, and abstract reasoning. Our Math program is designed to help students not only to expand their computational skills but also to 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: .....MQ7, MQ8 (for students with advanced standing)

## **ELECTIVE COURSES IN MATH**

### **MQ7 – ADVANCED MATHEMATICAL CONCEPTS**

(5 periods per week for 1 year – Not a Special Permission Course)

This course may be 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**

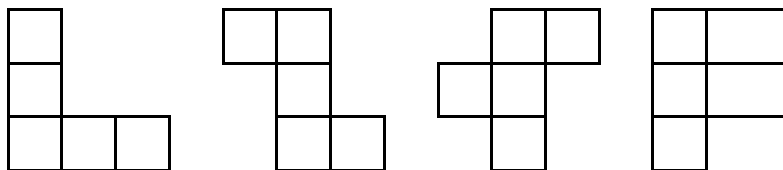
(5 periods per week for 1 year – Not a Special Permission Course)

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.

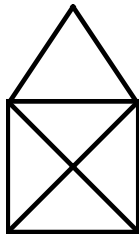
### **MEA1 - INVESTIGATION IN COLLEGE TOPICS IN MATHEMATICS**

(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 rhomb octahedron? 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. Prior computer experience is helpful. 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)

This 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. It is a college-level course, for which students can 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 \$82 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.

## **ELECTIVE MINORS**

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### **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.

### **MER1 - PROJECTS**

(5 periods per week for 1 year – Elective Minor - Not a Special Permission Course - taken in lieu of lunch)

Students who are interested in doing independent research in mathematics are encouraged to enroll in the projects class. These classes stimulate students to think in creative ways. Students explore interesting topics outside of 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, the Intel Science Talent Search, and other contests. These teams meet during a lunch period and students are permitted to eat lunch in class.

## **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 every day 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)*

## **THE BIOLOGICAL SCIENCES DEPARTMENT RESEARCH PROGRAM**

***The Biological Sciences Department at the Bronx High School of Science promotes the use of the scientific method as a mode of problem solving not only in our core curriculum, but also in our diverse elective courses and research opportunities that we offer our students.***

The goal of our research program and all of the electives in the Biology Department is the application of the scientific method to problem analysis and solving. We feel that this type of approach will not only develop skilled scientists, but also produce critically thinking citizens who are equipped to analyze tough questions in a world of rapid technological and social change.

Freshman are required to take a one semester Research Literacy Course in which they will learn how to follow the scientific method, to use computers as a tool for research and to write a scientific paper. Teachers from the Biology, English, Math, and Physical Science departments collaborate in teaching the course. Becoming literate in research will help Bronx Science students in subsequent science courses and will prepare them to take advantage of the many opportunities to do research that are available to them in upperclassmen.

Sophomores and juniors are provided with a unique science learning opportunity through our Junior Biology Research elective. This course is designed to maximize the bench experience of our students and expose them to “cutting edge” research methods. Students enrolled in this course are required to work in a professional laboratory under the supervision of an experienced researcher on a project of mutual interest. Research is conducted after school hours, during the school year, and full time during the summer months. The final product is a research paper, which submitted to the Intel Science Talent Search and other competitions during the student’s senior year. Full participation in the research program satisfies the Technical Drawing (Technology Department) and STL (Technology Department) requirement for graduation.

## **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.

### **SB1J – FRESHMAN (AND 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.

## **SOPHOMORE BIOLOGY COURSES**

**Students may enter the Biological Research Program as a Sophomore.**

### **SBP1, SBP3, SBP5 - BIOLOGY RESEARCH PROGRAM**

(5 periods per week for 1 year – Special Permission Required – 6th Major or elective minor)

Sophomores and Juniors with demonstrated ability and interest in Biology and research are invited to apply. Imagine working at the forefront of discovery. The Biology Research Program offers this unique opportunity to students. Investigations in all areas of the biological sciences are available; from the impact of global changes on living things in our environment to the impact of molecular changes on the functioning of cells. Students work side-by-side with researchers at the most prestigious university and medical school laboratories attempting to solve some of the most perplexing problems in biological science. In the process, students develop many academic and personal skills that will be of lifelong benefit. The product of the project work is a research paper. This paper may be entered into the Intel Science Talent Search, as well as other science competitions. In addition, students will do classroom science project-based work. Students who successfully complete this course fulfill the Technical Drawing and STL requirement for graduation and are awarded three course credits in science.

## **BIOLOGY ELECTIVES**

The following electives:

- Do not fulfill the “Lab Science” (3<sup>rd</sup> major) requirement for seniors.
- May be taken as a 4<sup>th</sup>, 5<sup>th</sup>, or 6<sup>th</sup> major.

### **SBX5-ADVANCED PLACEMENT PSYCHOLOGY**

(5 periods a week for 1 year – Special Permission Required – 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> 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 – Special Permission Required – 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> major but NOT A LAB SCIENCE- 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, reproductives 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 (3<sup>rd</sup> Major). THEY MAY ALSO BE TAKEN AS A ELECTIVE 1 (4<sup>th</sup> major), ELECTIVE 2 (5<sup>th</sup> major) or 6<sup>th</sup> 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 – 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> 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 – 3 single periods and 1 triple period field experience – Special Permission Required – Fills the Lab Science Requirement for seniors – 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, or 6<sup>th</sup> 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 – 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> 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.

### **SB37 – PLANT PHYSIOLOGY AND HORTICULTURE**

(5 periods per week for 1 year: 2 double period labs, 1 period recitation; or 5 periods per week depending on scheduling constraints and lab availability – Not a Special Permission Course - Fills the Lab Science Requirement for Seniors – 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> 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 – 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> major).

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.

## **SBM1 - 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 – 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, or 6<sup>th</sup> 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 by examination through Excelsior College at a Prometric Testing Center (\$120) or 3 college credits from The State University of New York at Albany may be available pending approval of the syllabus. SUNY Albany will charge a fee (TBD).

## **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 – 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, or 6<sup>th</sup> major).

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! ;-)

## **SBF5 - FORENSIC BIOLOGY (SCIENTIFIC SLEUTHING)**

(5 periods per week for 1 year: 3 single recitation periods, 1 double laboratory period - Fills the Lab Science Requirement for seniors – 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, or 6<sup>th</sup> major). LIMITED TO SENIORS ONLY

This course in forensic science focuses on the activities of a crime lab. Both laboratory and recitation sections deal with the methods used to link suspect, victim, and crime scene. These include laboratory exercises in fingerprinting, document and handwriting analysis, ballistics, serology, hair and fiber examination, anthropology, botany, and other analytical procedures. The use of DNA analysis for typing and profiling is investigated. A case study and current events approach will be used extensively during recitation periods. Guest speakers, videotapes, and field trips are used when appropriate. A shadow program is in place at the Albany Crime Lab for students interested in career opportunities in the field.

### **NOTE:**

STUDENTS WHO TAKE ADVANCED PLACEMENT COURSES *ARE REQUIRED TO TAKE* CORRESPONDING AP EXAMS IN MAY.

The ADVANCED PLACEMENT Exam Fee is \$82 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.

## **THE PHYSICAL SCIENCES DEPARTMENT RESEARCH PROGRAM**

***The Physical Sciences Department at the Bronx High School of Science promotes the use of the scientific method as a mode of problem solving not only in our core curriculum, but also in our diverse elective courses and research opportunities that we offer our students.***

The goal of our research program and all of the electives in the Physical Science Department is the application of the scientific method to problem analysis and solving. We feel that this type of approach will not only develop skilled scientists, but also produce critically thinking citizens who are equipped to analyze tough questions in a world of rapid technological and social change.

Freshman are required to take a one semester Research Literacy Course in which they will learn how to follow the scientific method, to use computers as a tool for research and to write a scientific paper. Teachers from the Biology, English, Math, and Physical Science departments collaborate in teaching the course. Becoming literate in research will help Bronx Science students in subsequent science courses and will prepare them to take advantage of the many opportunities to do research that are available to them in upperclassmen.

Sophomores and juniors are provided with a unique science learning opportunity through our Junior Physical Science Research elective. This course is designed to maximize the experience of our students and expose them to “cutting edge” research methods. Students enrolled in this course are required to work in a professional laboratory under the supervision of an experienced researcher on a project of mutual interest. Research is conducted after school hours, during the school year, and full time during the summer months. The final product is a research paper, which submitted to the Intel Science Talent Search and other competitions during the student’s senior year. Full participation in the research program satisfies the Technical Drawing (Technology Department) and STL (Technology Department) requirement for graduation.

## **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.

### **SP1 – 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:

### **SC1H – 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.

## **JUNIOR ELECTIVES IN PHYSICAL SCIENCE**

### **SPP1 - PHYSICAL SCIENCE RESEARCH- (Elective minor)**

(5 periods per week 1 year – Special Permission Required – Elective Minor - This course does not fill the Lab Science Requirement - Not 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> Major)

Experience the joy, exhilaration, and tremendous sense of accomplishment one gets from doing independent research in physics or chemistry. Each participant will be linked with a scientist at a university or private lab who will serve as a mentor/advisor. Students will work on an individual project, which involves designing an experiment to test the hypothesis for a particular problem and writing a paper on the results of the research. (Flexible hours are arranged. Student programs may include early dismissal to allow for travel to research sites.) The research paper may be entered in competitions such as the Intel Science Talent Search.

The first term hones your research skills, and involves team and individual projects and contests such as Duracell Design and Invention Competition, Space Science Involvement Program, DuPont Essay Challenge, Wonders of Plastics Essay, or the International Bridge Design Competition. Win money, gifts, and trips to Florida, Epcot Center, NASA Internships, fame, and fortune. The second term develop interests in a particular research field such as Materials Science, engineering, computer science, Earth and Environmental Science, Chemistry, Physics, Astrophysics, and other applied sciences. Open only to juniors with strong academic records. *Students who compete in the project may use this course to fulfill the “STL” requirement for graduation.*

## **SENIOR ELECTIVES IN PHYSICAL SCIENCE**

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

### **SPG1- EARTH SYSTEMS SCIENCE: (Atmospheric Science, Oceanography, Geology)**

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

The first term introduces the student to the basic factors of weather through activities, projects and labs. In the Weather-Watch Project, weather data is collected and analyzed for the current season and compared to a 10-year average for the vicinity. Weekly and monthly statistics are calculated and then compared to the 10-year climatology to discover anomalies. Time series graphs and scatter graphs are plotted for analysis. Regression lines and

correlation coefficients are calculated.

Students investigate the application of the principles of basic physics and chemistry to the interaction of the atmosphere, oceans and land. The composition, temperature structure, radiative balance, origin and evolution of the atmosphere are considered. Focus is placed on the major environmental issues of current concern such as global climate change (global warming) ozone depletion, and sea-level change, as well as techniques of modern weather forecasting and climate simulation. Computer technology is used learn the art and science of weather prediction.

Students use high tech NASA equipment and computers in long-term climate and weather data studies. The course emphasizes "hands on" studies, field trips, data analysis, research techniques and group activities. (Text: *The Atmosphere*, 7th Ed Prentice Hall, 1998, Lutgens and Tarbuck, Lab Manual: Exercises for Weather and Climate, 4th Ed. Greg Carbone, Prentice Hall 2001).

The second term covers the oceanography and geology portion of the course. It deals with the rocks and minerals that make up the earth's crust, as well as volcanoes, glaciers, the ice-ages, earthquakes, and continent building. Oceanography will include the history and formation of the oceans, currents, tides, beach erosion and shoreline development.

Learning activities developed in conjunction with scientists at NASA GISS, Columbia University, the Bronx High School of Science and the Weather Channel, will be incorporated. Field trips will include a Geology Walk in the New York Botanical Gardens. Tours and lectures on weather and climate at the Goddard Institute for Space Studies, and the American Museum of Natural History.

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 the course 3 college credits may be granted from the New York State University at Albany (SUNY) for the course ATMOSPHERIC SCIENCE ATM 100. A fee is required for college credit.

### **SCM1-MODERN FRONTIERS IN CHEMISTRY**

(5 periods per week, including lab – fulfills the "Lab Science" requirement for Seniors – May be taken as a 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> Major – Not a Special Permission Course)

This is a course in the chemical basis of everyday life. The format is recitation, reading, and analysis of current articles, and imaginative student presentations. The topics covered include food and nutrition, soaps and household chemicals, cosmetics, air and air pollution, water and water pollution, soil and solid waste, energy, plastics, and drugs and poisons.

Upon satisfactory completion of the course, 3 college credits may be granted from the New York State University at Albany. Their equivalent course is CHEM 100N. A fee is required for college credit.

Prerequisite: Regents Chemistry

### **SCR1-INTRODUCTION TO ORGANIC CHEMISTRY**

(5 periods per week, including lab – fulfills the "Lab Science" requirement for Seniors – May be taken as a 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>

or 6<sup>th</sup> 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. Classical wet methods for structure determination of an unknown organic compound will be coupled with instrumentation techniques. The course touches upon important organic topics like mechanisms and stereoisomerism that will certainly enhance the level of preparation for any college freshman entering a pre-medical program. The course provides 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 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> 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.

Labs are held once a week at Lehman College and are integrated with the course content. 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 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> 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

## **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 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> 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 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> 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 85 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 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> 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 \$82 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.

- 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 5<sup>th</sup> (elective 2) or 6<sup>th</sup> 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 COURSES**

Chinese	First Year through Regents
French	First Year through Fourth Year Honors, AP Language and AP Literature
Modern Greek	First Year through Fourth Year Honors Literature and College Level Modern Greek Language and Literature
Italian	First Year through Third Year Regents and Fourth Year Language and Literature, AP Language and Culture
Japanese	First Year through Fourth Year
Korean	Second and Third year offered as a foreign second language. Students must have completed the regents requirement in another language.
Latin	First Year through Regents and AP Literature, both Virgil or Catullus/Horace
Russian	First Year through Third Year and College Level Language and Literature
Spanish	First Year through Fourth Year Honors, AP Language and AP Literature

Students, who have successfully COMPLETED a 3-Year Regents Sequence in one language, have the option to choose 4th and 5th year courses in the same language or begin a new language.

## **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 5<sup>th</sup> or 6<sup>th</sup> 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.

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.

### **FFX7 - ADVANCED PLACEMENT FRENCH LANGUAGE**

### **FSX7 - ADVANCED PLACEMENT SPANISH LANGUAGE**

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

The Advanced Placement Spanish and French Language courses are open to juniors and

seniors who have earned a grade of at least 90 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.

### **FF7H - FRENCH - HONORS LITERATURE**

### **FS7H - SPANISH - HONORS LITERATURE**

(5 single periods per week for one year - May be taken as a 5<sup>th</sup> or 6<sup>th</sup> 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.

### **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 5<sup>th</sup> or 6<sup>th</sup> Major – Not a 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.

### **FUR7/ FUR9 - COLLEGE RUSSIAN**

(5 single periods per week for one year - May be taken as a 5<sup>th</sup> or 6<sup>th</sup> 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/HORACE**

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

This course is designed for juniors and seniors who wish to complete a college-level course in Latin poetry. They will receive college credit or advanced standing if they earn the appropriate score on the Advanced Placement examination. This course is based on readings from Virgil, Catullus and Horace and, enables students to:

- appreciate Latin poetry
- translate accurately
- interpret each passage critically
- read aloud with attention to pauses and phrasing
- scan the Latin hexameter verse

NOTE:

STUDENTS WHO TAKE ADVANCED PLACEMENT COURSES *ARE REQUIRED TO TAKE* CORRESPONDING AP EXAMS IN MAY.

The ADVANCED PLACEMENT Exam Fee is \$82 Per exam.

### **FJ7 – ADVANCED FOURTH YEAR JAPANESE LANGUAGE & CULTURE**

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

This course is intended for responsible, highly motivated students who wish to advance their study of the Japanese language and culture. Extensive training in aural/oral skills, reading comprehension, grammar, advanced vocabulary, organization and writing of compositions is an integral part of the course. Students will also have an opportunity to study the Japanese language and culture through literature and the arts, and to create projects based on Japanese history and culture.

### **FT7 - ADVANCED FOURTH YEAR ITALIAN CONVERSATION**

(5 single periods per week for one year - May be taken as a 5<sup>th</sup> or 6<sup>th</sup> 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 *America Oggi* - Italian/American daily newspaper).

Award-winning Italian films will be shown to provide the basis for lively class discussions (*Cinema Paradiso*, etc.) 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 - COLLEGE LEVEL GREEK -**

(5 single periods per week for one year - May be taken as a 5<sup>th</sup> or 6<sup>th</sup> 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 - ΝΕΑ ΕΛΛΗΝΙΚΑ: INTENSIVE MODERN GREEK FOR BEGINNERS**

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

This intensive introductory course is a continuation for students who have already taken beginning Modern Greek (FE1H/2H) or have a background in the Greek language. It can also be a 5<sup>th</sup> or 6<sup>th</sup> 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 5<sup>th</sup> or 6<sup>th</sup> Major – Special Permission Required)

This intermediate level course is designed for students with written, spoken and aural proficiency on the Korean language. Students who have already completed a Regents sequence in another foreign language are able to take these courses as fifth or sixth majors. Students will study the language, culture and literature of Korea.

## **THE TECHNOLOGY DEPARTMENT**

All students will benefit from the application of science, math problem solving skills and the understanding of the principles of design and construction as taught in Technology Education. The offerings of the department provide guided experiences in the preparation of projects that support the focus of our school and develop the technological literacy necessary for competition and success in our world.

In the sophomore year, all students learn Technical Drawing, the universal language of science and industry. Technical Drawing instruction includes the use of basic drafting instruments and progresses to Computer-Assisted Drafting (CAD).

In Science Technology Laboratory (STL), taken for one term in the junior year, students select coursework from a broad range of enticing options providing experimental or project work in specialized areas of interest. Opportunities for construction in wood, metal, glass, plastics, electronics and any other suitable materials are presented with proper instruction on the use of related tools and equipment. The STL Selectives and descriptions are provided to help you select the area of study that best meets your needs.

Technology Education Electives open to sophomores, juniors, and seniors are described below.

### **REQUIRED TECHNOLOGY COURSES**

#### **TTD1 - TECHNICAL DRAWING**

(5 periods per week for 1 year – Required Sophomore Minor – Not a Special Permission Course – Not a 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> major)

Technical drawing is the universal language of science and industry. Students learn the elements of orthographic projection, draw sectional views, and develop the surface shapes of basic mathematical and irregular solids. Students prepare working drawings of objects and machines, practice scientific illustration and learn presentation graphics. Student drawings are prepared using a combination of manual and computer assisted drafting skills and techniques. Extraordinary work may be exhibited and entered in contests.

#### **SCIENCE TECHNIQUES LAB (STL)**

**The STL Graduation Requirement:** All students are required to take a “Hands-on” course during the junior year. The requirement may be satisfied by any of the STL selectives below or through participation in the Research Program. Research courses may be taken in Biological Science, Physical Science, Mathematics and Social Science. A commitment to the research program satisfies the STL requirement. Students who select research a must complete a year-long 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 courses listed below.

**Science Techniques Lab (STL)** provides a unique opportunity for students to design, construct, test and experiment with scientific, electronic, mechanical and other projects using tools and equipment that are specific to the discipline selected. *Students are able to choose specific STL options from the “STL Selectives” list.* All juniors must successfully complete a one-term STL course or equivalent research course. NOTE: Selectives have limited enrollment and are subject to availability.

**IMPORTANT NOTE ABOUT SELECTIVE COURSES:** The Program Committee will try to honor student requests for selective courses however another selective course may be substituted for a selective due to scheduling difficulties or class size limitations.

## **STL SELECTIVES**

### **TCM - ROBOTICS TECHNOLOGY**

(5 periods per week for 1 term – satisfies STL Requirement for Graduation)

This course will encourage and support creativity, innovation and ingenious solutions to mechanical problems through the programming and use of computer controlled robotic equipment and student-designed, purpose built devices. Science and Engineering are partnered with design and construction enabling students to realize and experience the satisfaction of solving challenging, practical problems.

### **TEC – TELEVISION PRODUCTION TECHNOLOGY**

(5 periods per week for 1 term– satisfies STL Requirement for Graduation)

Students will prepare original video projects using the advanced 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 - ALTERNATIVE STRUCTURE TECHNOLOGY**

(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 is designed to excite students in the application of math and physics to solve engineering problems through the design and construction of various structures. Instruction include understanding tension and compression, truss design and alternate construction techniques.

### **TSM - SCIENCE TECHNOLOGY PROJECTS**

(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 projects such as models illustrating scientific and engineering principles and they have entered their experimental devices in Intel, science fair, and citywide technology contests.

## **TTS – 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 and 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 by all students as 5<sup>th</sup> major (elective 2), or 6th majors. These courses do not fulfill the STL requirement.

### **TDA1 - ARCHITECTURAL DRAFTING**

(5 periods per week for 1 year - May be taken as either a 5th or a 6<sup>th</sup> major – Prerequisite - Technical Drawing)

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 public service systems. Students will prepare models and design solutions for the various problems encountered when planning private houses, apartments, hospitals, libraries, schools, municipal buildings. The class uses manual drawing and CAD for the preparation of plans, elevations and specifications, solar orientation, and energy conservation.

Prerequisite: Technical Drawing

### **TFP1 - PHOTOGRAPHY**

(5 periods per week for 1 year- May be taken as either a 5th or a 6<sup>th</sup> major)

This course teaches and applies three important approaches to the elements of photography art, technology and science. Students will learn to use cameras intelligently and creatively. They will become familiar with the various concepts, reactions, physical phenomena, processes, and techniques used in producing the black-and-white image. They will learn to shoot, print, and manipulate photos as well as explore photography as a powerful tool for documentation of occurrences and events. Instruction includes advanced techniques such as special effects, photo silkscreen, mixed media, hand-made slides and prints, photo essay, halftones and alternative photo processes. Digital imaging, scanning, image software manipulation and printed output of a finished product will be included. The use of computers in image editing and special effects will be explored. Students will need access to an advanced, adjustable 35mm camera and be responsible for material costs..

### **TCA1 - COMPUTER TECHNOLOGY**

(5 single periods for 1 year- May be taken as either a 5th or a 6<sup>th</sup> major)

"Build your own Personal Computer clone" 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. There will be opportunities for the original prototyping of sensors, voice input modules or other data acquisition devices. 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 5<sup>th</sup> or a 6<sup>th</sup> 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.

## **TPE1 - PRINCIPLES OF ENGINEERING**

(5 single periods per week for 1 year- May be taken as either a 5<sup>th</sup> or a 6<sup>th</sup> major)

This New York State curriculum was developed in response to national studies that suggest implementation of pre- college courses that survey and stimulate interest in and access to careers in engineering and technology. The course will be taught in a laboratory setting providing access to tools and materials for individual, small-group, and large-group projects. Tools may include hand and machine tools, computer data acquisition and control devices and electronics trainers. Computers may be used for design, problem solving, and process control. The major engineering concepts to be developed are systems, modeling, the responsible interaction of technology and society, design, and ethics. This exciting and innovative course will surely be an asset to all those who participate and particularly to those who intend to major in the field of engineering in college.

## **TCG1 - COMPUTER GRAPHICS**

(5 periods per week for 1 year- May be taken as either a 5<sup>th</sup> or a 6<sup>th</sup> 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. The school owns top commercial software as is used in industry. This innovative elective course will develop student skills in using the computer as a creative art tool. It will also make students aware of the growing career potential of computer graphics through readings, and demonstrations. Students will have hands-on experience with the IBM PC in our modern graphics lab, to create, capture, modify, and print their assignments. Outstanding work will form the basis for exhibits and shows. Students may produce web pages to display their work.

## **TEC1 – CISCO NETWORKING**

(5 periods per week for 1 year- May be taken as either a 5<sup>th</sup> or a 6<sup>th</sup> major)

The course is appropriate for students who have a strong interest in computing and who wish to pursue computer science in college. The course involves learning about computer networks, how and why they work and how to design and maintain them. Instruction includes, but is not limited to safety, networking, network terminology and protocols, network standards, LANs, WANs, the OSI model, Ethernet, Token Ring, Fiber Distributed Data Interface, TCP/IP Addressing Protocol, dynamic routing, subnets, and the network administrator's role and function. Particular emphasis is given to the use of decision-making and problem solving techniques to solve networking problems.

## **ELECTIVE MINORS IN TECHNOLOGY**

### **NOT A 5<sup>TH</sup> OR 6<sup>TH</sup> MAJOR**

#### **TCA7-ADVANCED INTERNETWORKING**

(5 single periods per week for 1 year – Special Permission Required - Elective Minor Only – May NOT be taken as a 5<sup>th</sup> or 6<sup>th</sup> 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 meet regularly with the teacher to discuss the project. Independent research is often required. Team projects may be considered.

#### **TJS1 – THEATRE TECHNOLOGY**

((5 single periods per week for 1 year – Special Permission Required - Elective Minor Only – May NOT be taken as a 5<sup>th</sup> or 6<sup>th</sup> Major)

This course is recommended for students who are interested in the design and construction of props and scenery for school plays and musical performances. A study of the sound systems, lighting and set construction and arrangement will be made. Students will have an opportunity to work on behind the scenes technical support for one of the plays or musical performances.

## **THE FINE ARTS DEPARTMENT**

### **COURSE OFFERINGS**

Our program of fine arts and visual communication is designed to help students develop their creative powers and, at the same time, understand those factors in our culture that add beauty, stimulation, and enrichment to living. The arts are as much a body of subject matter, as they are a creative way of doing and perceiving things. The arts enlist students' imagination, ideas, and abilities, and impel them to learn more about and appreciate the world around them.

### **REQUIRED ART COURSE**

#### **A10 – STUDIO IN ART (ART APPRECIATION)**

(5 periods per week for 1 term – Required Freshman Minor – Not a Special Permission Course – Not a 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> major)

Studio in Art is required of all students. In this school, it is usually taken in the freshman year for one term. The Studio in Art course teaches the students to their great art heritage from prehistoric times to the present. They develop an appreciation of this heritage through experimentation with a variety of media, both two- and three-dimensional, thus relating themselves in a basic way to the technical problems of the artist. They are introduced to the possibilities of creation and to the delight of seeing the elements and principles of art evolve into personal visual creative ideas and emotions rendered in a wide variety of media.

### **ELECTIVE ART COURSES**

(One year)- Fifth or 6<sup>th</sup> Majors

#### **ADD1 – STUDIO IN DRAWING AND DESIGN**

(5 periods per week for 1 year – Not a Special Permission Course – Prerequisite: Art Appreciation or 8<sup>th</sup> grade accelerated art - May be taken as a 5<sup>th</sup> or 6<sup>th</sup> major)

Students will work on projects to acquire fundamental drawing skills, which will allow them to communicate their ideas visually. Drawing styles and techniques will be investigated using a variety of drawing materials. 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 problem-solving skills. Through this process of discovery, students will not only build confidence and discipline, but will also further their intellectual, emotional, and physical involvement in the process of making art.

#### **APP1 – STUDIO IN PAINTING**

(5 periods per week for 1 year – Not a Special Permission Course – Prerequisite: Art Appreciation or 8<sup>th</sup> grade accelerated art. May be taken as a 5<sup>th</sup> or 6<sup>th</sup> major)

This course will help students find their own unique approach for artistic expression through the manipulation of paint. Students will also develop a vocabulary for intelligently discussing and critiquing art. This vocabulary will address issues of content, form, and material. 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, paint from life and from imagination and experiment with different painting techniques. This course will also assist in the development of the art portfolio which is necessary for

acceptance to the Advanced Placement Studio Art Course.

### **ADS1 – STUDIO IN SCULPTURE**

(5 periods per week for 1 year. Not a Special Permission Course – Prerequisite: Art Appreciation or 8<sup>th</sup> grade accelerated art. May be taken as a 5<sup>th</sup> or 6<sup>th</sup> major)

This course offers the students an outlet for self-expression in three-dimensional design using a variety of materials. 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. Sculpture demands the development of skills gained by the synthesis of training, knowledge, and experience. This course will develop these skills through practice and exercises resulting in good craftsmanship and creativity. The objectives of this course are to develop perceptual and aesthetic sensitivity and an appreciation and understanding of three-dimensional form.

## **ADVANCED PLACEMENT COURSES in ART**

### **AUX1 – ADVANCED PLACEMENT STUDIO ART**

(5 periods per week for 1 year – Special Permission Required – May be taken as a 5<sup>th</sup> or 6<sup>th</sup> 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 outside study. 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.

PREREQUISITES: Studio in Art (Art Appreciation) and one (1) of the following art elective courses:

- Studio in Drawing and Design
- Studio in Painting
- Studio in Sculpture
- Computer Graphics or Photography.

### **AUX3 - ADVANCED PLACEMENT ART HISTORY**

(5 periods per week for 1 year – Special Permission Required – May be taken as a 5<sup>th</sup> or 6<sup>th</sup> major)

The Advanced Placement program in the history of art is designed for students interested in extending their knowledge and understanding of works of art. Students will study fine works of art in relation to the period in which the works were produced as well as examine the artwork as lasting universal aesthetic statements. It is important that students be interested in college-level study and be 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 in relationship to scholarly work, will be required. 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.

NOTE:

STUDENTS WHO TAKE ADVANCED PLACEMENT COURSES *ARE REQUIRED TO TAKE* CORRESPONDING AP EXAMS IN MAY.

The ADVANCED PLACEMENT Exam Fee is \$82 Per exam.

## **THE MUSIC DEPARTMENT**

Students are offered musical experiences designed to increase their appreciation of music as both art and science. The required course in Music Appreciation, taken in the freshman year, surveys the history of music and teaches how to listen to musical styles, periods, and composers.

Performance is an integral part of school life in assemblies, ceremonies, concerts, and recitals, providing rewarding performance opportunities not generally available outside of school. Students at all grade levels may audition for regularly scheduled classes in orchestra, concert band, stage band, ensemble, and chorus. Outstanding students perform in All-City groups and after-school programs. A performance commitment is required.

### **REQUIRED MUSIC COURSE**

All students must take either Music Appreciation (5 periods per week for 1 term) or they may be eligible for a performing music class based upon an audition. Performing music classes meet 5 periods per week for one year.

#### **U1R - MUSIC APPRECIATION**

(5 periods per week for 1 term – Not a Special Permission Course – This is a “Minor” course - May Not be taken as a 5<sup>th</sup> or 6<sup>th</sup> Major)

The required course in MUSIC APPRECIATION, usually taken in the freshman year, explores the values of music for the individual as an educated member of society. Students survey the history of music and learn how to listen to the outstanding musical styles, periods, and composers. They are encouraged to comment on and analyze various works both objectively and subjectively, while common threads and interrelationships are developed. Coursework also includes music theory.

### **PERFORMING MUSIC COURSES**

All students may apply for admission to the following courses (auditions required).

- These courses satisfy the music requirement for graduation.
- Students may remain in performing music for four years.
- The following courses are elective minors. They may be taken as an extra class.
- They may not be taken as a 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup> or 6<sup>th</sup> major.

#### **UGB1 – INTRODUCTORY INSTRUMENTAL MUSIC**

(5 periods a week for 1 year – Audition Required - Elective Minor Only – May NOT be taken as a 5<sup>th</sup> or 6<sup>th</sup> Major)

This is the beginning Instrumental Class for students who wish to learn how to play a band instrument. It is possible to move up to a performing class based on student progress. Students may study wind, string or percussion instruments.

#### **UDC1 - CONCERT BAND**

(5 periods per week for 1 year – Audition Required – Elective Minor Only – May NOT be taken as a 5<sup>th</sup> or 6<sup>th</sup> 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. Performance commitments are required.

### **UDC3 - INTERMEDIATE BAND**

(5 periods a week for 1 year – Audition Required – Elective Minor Only – May NOT be taken as a 5<sup>th</sup> or 6<sup>th</sup> Major)  
This performing group features full band instrumentation and a full repertoire. Performances are scheduled for many forms of music for the intermediate player. Advanced students may be chosen to join the concert band for the following school year.

### **UDT1 - STAGE BAND**

(5 periods per week for 1 year – Audition Required – Elective Minor Only – May NOT be taken as a 5<sup>th</sup> or 6<sup>th</sup> Major)  
Jazz, the distinctly American musical idiom, in its many forms and varieties, is the essential element in Stage Band performance. The 18-piece "swing" instrumentation will play selections from the 30s, 40s and 50s "Big Band" era right through the 90s. Audition and performance commitment required.

### **UMN1 - SMALL ENSEMBLE**

(5 periods per week for 1 year – Audition Required – Elective Minor Only – May NOT be taken as a 5<sup>th</sup> or 6<sup>th</sup> 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 single periods per week for 1 year – Audition Required – Elective Minor Only – May NOT be taken as a 5<sup>th</sup> or 6<sup>th</sup> 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. Performances include music assemblies, winter and spring concerts, graduation and festival appearances.

### **UVE1 – CHORUS**

(5 single periods per week for 1 year – Audition Required – Elective Minor Only – May NOT be taken as a 5<sup>th</sup> or 6<sup>th</sup> 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. 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:

Aerobics	Gymnastics	Weight Training
Basketball	In-Line Skating	Whiffle Ball
Baseball	Soccer	Yoga
Fitness	Speed ball    Ultimate	
Flag Football	Volleyball	

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	Gymnastics Boys & Girls
Basketball Varsity & Jr. Varsity (Boys & Girls)	Handball Boys & Girls
Bowling Coed	Indoor Track Boys & Girls
Crew Coed	Soccer Boys and Girls
Cross Country Boys and Girls	Swimming Boys and Girls
Fencing Coed	Tennis Boys and Girls
Golf Boys & Girls	Volleyball Varsity Boys
	Volleyball Varsity and Jr. Varsity Girls
	Softball Girls Varsity & Jr. Varsity

## **GRADUATION REQUIREMENTS**

STUDENTS MUST TAKE AND PASS 5 MAJORS EACH TERM.

English	4 years - (5 years if accelerated)
Social Studies	4 years - (5 years if accelerated)
Laboratory Science	4 years - (Biology, Chemistry, Physics, Lab. Science)
Mathematics	3 years (Advanced Mathematical Concepts required if accelerated)
Foreign Language	2-3 years 2yrs @ Bronx Science Regents Sequence Required
Technical Drawing or Sophomore Research	1 year
Art Appreciation	1 term
Music Appreciation	1 term - (or 1 year performing music)
STL	1 term - (or 1 year of Intel projects)
Health	1 term
Physical Education	8 terms
Elective 1	1 year - (Science or Math)
Elective 2	1 year - (Any class except those listed below**)

Regents must be passed in English, Global History, U.S. History, Biology, Chemistry, Physics, Math A and Math B and Foreign Language. Please check that exams and appropriate course credit are recorded on your transcript.

Students, who fail History 7, History 8 or any term of English must repeat each term failed. Students who fail the second term of any subject are advised to attend summer school to repeat the second term only. Credit for TERM ONE cannot be granted for a course already passed i.e. students may not receive credit for the same academic course twice.

## **COURSE SELECTION INFORMATION**

### **For**

## **STUDENTS ENTERING THE SENIOR CLASS**

**Every Student entering the senior class must enroll in the following 5 courses for their senior year:**

- English
- History
- Lab Science
- Another science or a math course (elective 1)
- \*\*Another major (a fifth major) (elective 2) or complete your three-year language sequence

Any MAJOR course EXCEPT the following elective minors:

- Debate
- Yearbook
- Journalism
- Theatre Workshop
- TV Production
- Advanced Acting and Play Production
- Drama Workshop
- Advanced Internetworking
- Musical Group
- any other course listed as a "sixth major only" course

## **PROGRAM PLANNING GUIDELINES**

	<b><u>Freshman Program</u></b>	
	<b><u>Fall</u></b>	<b><u>Spring</u></b>
1	English	English
2	Social Studies	Social Studies
3	Mathematics	Mathematics
4	Science	Science
5	Foreign Language	Foreign Language
6	Art Appreciation, Music Appreciation or Performing Music*	Art Appreciation, Music Appreciation or Performing Music*
7	Physical Education	Physical Education
8	Research Literacy either fall or spring term*	Research Literacy either fall or spring term*
9	Lunch	Lunch

\* Students who are scheduled for Art Appreciation in the fall term will be scheduled for Music Appreciation in the spring term; students who are scheduled for Music Appreciation in the fall will be scheduled for Art Appreciation in the spring term.

Students who participate in Performing Music (Band, Chorus, Orchestra etc...) postpone Art Appreciation until the Sophomore or Junior Year. It is 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. Research Literacy skills are embedded into the Honors Science syllabus.

	<b><u>Sophomore Program</u></b>	
	<b><u>Fall</u></b>	<b><u>Spring</u></b>
1	English	English
2	Social Studies	Social Studies
3	Mathematics	Mathematics
4	Science	Science
5	Foreign Language	Foreign Language
6	Technical Drawing or Sophomore Research	Technical Drawing or Sophomore Research
7	Physical Education	Physical Education
8	Lunch	Lunch
9	6 <sup>TH</sup> Major (optional)	6 <sup>TH</sup> Major (optional)

	<b><u>Junior Program</u></b>	
	<b><u>Fall</u></b>	<b><u>Spring</u></b>
1	English	English
2	Social Studies	Social Studies
3	Mathematics	Mathematics
4	Science	Science
5	Foreign Language or any Elective	Foreign Language or Elective
6	STL * or Projects **	Health *
7	Physical Education	Physical Education
8	Lunch	Lunch
9	6 <sup>TH</sup> Major (optional)	6 <sup>TH</sup> Major (optional)

	<b><u>Senior Program</u></b>	
	<b><u>Fall</u></b>	<b><u>Spring</u></b>
1	English	English
2	Social Studies	Social Studies
3	Lab Science	Lab Science
4	Science or Mathematics (Elective 1),	Science or Mathematics (Elective 1)
5	Fifth Major (Elective 2)	Fifth Major (Elective 2)
6	Physical Education	Physical Education
7	Lunch	Lunch
8	6 <sup>TH</sup> Major (optional)	6 <sup>TH</sup> Major (optional)
9		

\* Health and STL may be reversed fall to spring for administrative scheduling reasons without notice.

\*\*Project classes are year long classes. STL classes are 1 term.

The following courses should have been completed by the end of your sophomore year:

English-1,2,3,4

History- 1,2,3,4

Biology -1,2

Chemistry-1,2 or

Physics 1,2

Foreign Language-1,2,3,4Mathematics 1,2,3,4

Art Appreciation or Music Appreciation & Technical Drawing

Research Literacy (this requirement is waived for students who enter Bronx Science as 10<sup>th</sup> graders)

**NOTE:**

1. Students who do not pass E1, 2, 3, & 4 AND H1, 2, 3, & 4 may not be promoted into grade 11.
2. You may not advance in major subjects in summer school
3. All courses you have not passed MUST be completed in summer school THIS SUMMER. Failures in major subjects must be made up at Bronx Science summer school, unless the department supervisor grants written permission in June.
4. Students may advance in Art, Music, STL, and Health in summer school. If you are “making-up” a course it is wise to fill in required minors during the summer.
5. Requests for a sixth major it will be added to your program only if the budget permits.
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. All students must take English, History and a laboratory science every year
8. Seniors' 1st elective choice (4<sup>th</sup> course) must be a science or math course
9. Seniors' 2<sup>nd</sup> elective choice (5<sup>th</sup> course) may be any academic course including but not limited to Advanced Placement courses and any others that are NOT designated as a sixth major only or elective minor [If you have not completed a 3-year Regents course in language, you must take that class as an additional major, in addition to elective 1].
10. 6<sup>th</sup> majors in any department may be taken in addition to the 5 majors.
11. There are many eligible sixth majors in all subjects: English, history, math, science, technology, art and language. Students who entered Science as a sophomore and did not take a basic science (Bio, Chemistry or Physics) as a freshman must take this class in the senior year. This science will fulfill both the 2<sup>nd</sup> 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.
12. All students must take and pass Physical Education (Gym) every term.

## **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 those courses that do not apply to you. Make sure that all graduation requirements will be met by the end of your senior year. 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. For example, only students who accelerated in English in grade eight need to take English 9/10. 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.

Courses needed to Graduate	Already Passed	Freshman Year	Sophomore Year	Junior Year	Senior Year	Summer School
English 1 / 2		+				
English 3 / 4			+			
English 5 / 6				+		
English 7 / 8					+	
English 9 / 10 (Can Be Used As Elective 2 If Not Accelerated)					+	
Global History 1 / 2		+				
Global History 3 / 4			+			
History 5 / 6				+		
History 7					+	
Economics 8					+	
History 4 <sup>th</sup> Year					+	
Biology		+				
Chemistry			+			
Physics			+	+		
Senior LAB SCIENCE				+	+	
Language 1 / 2		+				
Language 3 / 4			+			
Language 5/6				+	+	
Advanced Language (May Be Used As Elective 2)				+	+	
Math 1 / 2		+				
Math 3 / 4		+	+			
Math 5 / 6			+	+		
Math 7 / 8				+	+	
Elective 1					+	
Elective 2					+	
Technical                      Drawing Or Sips			+			
STL Or Intel Projects				+		
Music		+		+		++
Art		+				++
Research Literacy		+				
Physical                      Education (Gym)1/2		+				
Physical                      Education (Gym)3/4			+			
Physical                      Education (Gym)5/6				+		++
Physical                      Education (Gym)7/8					+	
Health Education					+	

Fill in the form below to prepare for elective day and Course Selection Day

Name \_\_\_\_\_ Official Class \_\_\_\_\_

ID# \_\_\_\_\_ Counselor \_\_\_\_\_

College Mentor \_\_\_\_\_

## **NOTES**

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

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Courses to visit on Elective Day (Note room numbers)

_____	_____
_____	_____
_____	_____
_____	_____

My Five majors (1st choice)

My Five majors (1<sup>st</sup> Alternate)

1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____

My Five majors (2<sup>nd</sup> Alternate)

My Five majors (3rd Alternate)

1. _____	_____
2. _____	_____
3. _____	_____
4. _____	_____
5. _____	_____

Sixth major, extra course (if necessary) or elective minor

6. _____	_____
7. _____	_____

**NOTES:**

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## **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](http://www.bxscience.edu).

Questions related to the Course Catalog on the Internet should be directed to the appropriate department or Mr. Borer, Assistant Principal / Pupil Personnel Services via surface mail or via E-Mail to [borer@bxscience.edu](mailto:borer@bxscience.edu).

This guide was paid for by a grant from:

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