



**JOHN D. O'BRYANT  
SCHOOL OF  
MATHEMATICS AND  
SCIENCE**

**COURSE DESCRIPTIONS**

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# **COMPUTER TECHNOLOGY**

## **C 51 TECHNOLOGY LITERACY**

### **Semester/Half-Year Course**

Technology Literacy is an introductory computer course. It is designed to give all students the skills they need to support their learning in core curriculum areas. This project-based course provides an overview of basic technology skills in a Windows or Mac environment. Microsoft Office, including Word, Excel, and PowerPoint, is the primary instructional software used. In addition, Inspiration, and Internet research techniques will give students the opportunity to apply their skills to their own academic and personal research, personal problem solving, and communication. Students will also develop an understanding of the responsible use of technology and an understanding of ethics and safety issues in the use of electronic media. Students will use these skills to develop unit-based mini-projects as well as one major final project to demonstrate their understanding of the use of technology to support their curriculum work.

## **C61 IT Foundations**

### **Spring 2010 Semester/Half-Year Course/3 Credits from UMass/Boston**

The IT Foundations course will provide students with the skills they need to use computers as an effective information technology tool. The course will provide an introduction to programming and animation and provide instruction in how to resolve numerous technology glitches/issues. No prior technology course is required.

## **C84 Java Programming**

### **Fall 2009 Semester /Half-Year Course/3 Credits from UMass/Boston**

The Java Programming course will provide an introduction to the fundamental concepts of computer programming. This course will provide the basic skills for computational problem solving that are applicable in many modern computing environments. The course is presented in an interdisciplinary manner and emphasizes how computing is used in mathematics, science and engineering. No prior programming experience is required

## **C5C CISCO NETWORK 1**

### **Full-Year Course**

Computer Technology is a growing field and offers numerous opportunities. The Cisco Networking 1 course emphasizes decision-making and problem-solving techniques in the application of science, mathematics, communication and social studies concepts to solve computer-networking problems. Students will learn how to install and configure Cisco switches and routers in multi-protocol networks using local and wide-area networks (LANs and WANs), provide Level 1 troubleshooting service, and improve network performance and security. Additionally, instruction and training are provided in the proper care, maintenance, and use of networking software tools and equipment, as well as all local, state, and federal safety, building, and environmental codes and regulations.

#### **Specific Learning Objectives:**

- Computer hardware and software, electricity, networking terminology, and protocols
- LANs and WANs, Open Systems Interconnection (OSI) model, Ethernet, and Internet Protocol (IP) addressing
- Design and documentation of a basic network and structured cabling
- Network-to-network communications
- Router user interfaces, components and configurations
- Basics of IOS versions, naming and software backup
- TCP/IP Protocol Suite and IP addressing and submitting
- Interior routing protocols—RIP, IGRP

# ENGLISH

## 137 ENGLISH LANGUAGE ARTS

Grade 7

This foundation course uses literature to guide students in understanding the author's role as both a storyteller and a communicator of universal truths. Students are encouraged to connect fictional protagonists to concepts of courage, perseverance, justice, reconciliation and morality. This objective is met through discussion, formal written assignments, oral presentations and cooperative learning activities.

At the same time, this study informs students in analysis of the basic elements of literature and language, as well as the acquisition of new vocabulary through context, isolation of root words, and direct instruction. Students are introduced to poetry with an emphasis on the sonnet form. Grammar usage and syntax are taught in the context of writing as well as through separate units. A major comprehension objective is the ability to infer an author's intent based on tone and rhetoric.

During the year, students begin to develop research skills and will produce a research paper in which they develop a thesis and cite sources.

## 138 ENGLISH LANGUAGE ARTS

Grade 8

This course uses its core literature to teach students a variety of strategies that, when applied to the reading enhances understanding, enjoyment and appreciation of literature in a variety of genres and prepares them for transition to grade nine. Students apply the basic elements of different literary genres to interpret, analyze, and evaluate the structure, language, and ideas of the literature they read. Students make connections between the readings and their own experiences to further enhance the meaning of the literature on a personal level, which enables them to develop as critical and reflective thinkers. Students learn to express what they have learned and to share ideas and perspectives on important issues in formal and informal situations in oral discussions and presentations, and in written essays.

New vocabulary is learned through context, isolation of root words, and direct instruction. Grammar is taught in the context of writing as well as through separate units.

A major comprehension objective is the ability to infer an author's intent based on tone and rhetoric. Media and technology are integrated into curriculum and instruction and students' work may include guided Internet research and PowerPoint presentations. During the year, students continue to develop research skills and will produce a research paper in which they develop a thesis and cite sources

## **151 COLLEGE ENGLISH**

Grade 9

The ninth grade curriculum uses various literature selections to explore the idea of facing and overcoming adversity, challenges, and other obstacles in one's attempt to achieve greater self awareness. The course teaches students a variety of reading strategies to enhance their understanding, exploration, enjoyment, and appreciation of literature in a variety of genres. They make personal connections, and use the elements of literature to interpret, analyze and evaluate the structure, language and ideas in the literature they read. They learn the characteristics of effective expository writing as they respond to literature and share their ideas and perspectives on issues in formal and informal situations. Students improve vocabulary through contextual reading, the isolation of root words, and direct instruction. Grammar is taught in the context of student writing as well as through separate units of study. Students continue to develop inference skills and understanding of tone in order to interpret author's purpose and understand theme. Media and technology are integrated into the curriculum and student work may include guided Internet research and PowerPoint presentations. The literary analysis research paper is a promotion requirement.

## **152 COLLEGE ENGLISH**

Grade 10

Through the instruction of the grade ten English curriculum students analyze characterization techniques as well as the authors' use of figurative language, imagery, and other literary techniques in a variety of genres. The curriculum explores the themes of injustice, from the Nazi concentration camps of Europe to the impact of racism in the Jim Crow South. Students learn to compare and contrast, to draw connections, and to apply what they have learned to their own world. Students learn to delve beyond the superficialities of mere plot details, to grapple with the deeper moral and spiritual meanings of the works and finally express their ideas in a variety of ways, including writing, presentations, and cooperative learning scenarios. Vocabulary is taught in the context of the literature they read, as well as through word study units. Grammar, is taught through student writing, as well as through separate units of study. Media and technology are integrated with the study of the literature. The literary analysis research paper is a promotion requirement.

## **162 HONORS ENGLISH**

Grade 10

The Honors grade ten English curriculum covers the College English ten course of study but goes beyond it through depth and inclusion of additional texts. The literary analysis research paper is a promotion requirement.

## **153 COLLEGE ENGLISH**

Grade 11

The English 11 course strives to prepare students for college by surveying literature that addresses the American struggle, the need to create a just society versus the need for individual freedom and personal integrity. The literature also addresses the optimism engendered by the belief in man's basic goodness versus the pessimism engendered by the reality of evil. Writing in grade eleven focuses first on the applications of the ideas found in the literature to students' own lives and thoughts. Writing at this level is persuasive and focuses on learning and perfecting skills necessary to produce a substantial research paper following MLA guidelines. These skills include reading independently, locating and using critical texts on line and in the library, note taking, developing a thesis, outlining, organizing, revising, proofreading and word processing a research paper. Vocabulary is taught in the context of the literature as well as through word study units. Media and technology are integrated with the study of literature. The eleventh grade final writing product, a persuasive argument research paper, is a promotion requirement.

## **163 HONORS ENGLISH**

Grade 11

The Honors grade eleven English curriculum covers the College English eleven course of study but goes beyond it through depth and inclusion of additional texts. The eleventh grade final writing product, a persuasive argument research paper, is a promotion requirement.

## **171 ADVANCED PLACEMENT LANGUAGE & COMPOSITION**

Grade 11

Prerequisite: See AP Protocol

The AP English Language and Composition course engages students to write in a variety of forms-narrative, exploratory, argumentative and on a variety of subjects, from personal experiences to public policies, from imaginative literature to popular culture. Expository analytical and argumentative writing form the basis of academic and professional communication: personal and reflective writing foster the development of writing facility in any context. The final writing project for the eleventh grade, a persuasive argument research paper, is a promotion requirement. Students are required to attend the scheduled Saturday AP test preparation workshops. **All students are required to take the AP Exam in May.**

## 154 COLLEGE ENGLISH

Grade 12

The grade twelve English curriculum focuses on the literary analysis of great literature, going beyond previously learned concepts to deeper levels of meaning and advanced literary techniques used by writers. Students use literature to explore concepts of tragedy, responsibility, growth, and decision making. Attention is paid to “close reading,” focusing on diction, figurative language and philosophical assertions. They draw parallels between texts and make connections to their own lives. Vocabulary is taught in context as well as through word study units. Media and technology are integrated with the study of literature. The literary analysis research paper is a graduation requirement.

### College English 12 Courses:

- British and World Literature
  - Students read classic texts such as Chaucer’s *Beowulf* as well as modern works such as Hussein’s *The Kite Runner* as they achieve the objectives of College English 12.
- African American Literature
  - Students survey a variety of texts from narratives of former slaves such as Harriet Jacobs to the works of current African American writers such as *Beloved* by Toni Morrison, as they achieve the objectives of College English 12.
- The Mono-Myth: The Heroes’ Journey
  - Students will study the mono-myth as delineated in Joseph Campbell’s *Hero with a Thousand Faces* and apply the archetype to classic texts such as Homer’s *Odyssey* as well as modern graphic novels.

## 164 HONORS ENGLISH

Grade 12

The Honors grade twelve English curriculum covers the College English twelve course of study but goes beyond it through depth and inclusion of additional texts. The literary analysis research paper is a graduation requirement.

## 172 ADVANCED PLACEMENT LITERATURE & COMPOSITION

Grade 12

Prerequisite: See AP Protocol

The Advanced Placement English Literature and Composition course emphasizes interpretation through analysis and the formulation of ideas in writing. This course aims to enhance students’ abilities to interpret, analyze and appreciate the complexities of the English/American canon, through “close readings” of great literature. Students will participate in in-depth analyses of works by such authors as: Shakespeare, Swift, Conrad, Shelley, Ibsen, and Achebe, and major poets of British and American literature, as they study the techniques used by authors to achieve their literary purposes.

The literary analysis research paper is a graduation requirement. Students are required to attend scheduled Saturday AP test preparation workshops. **All students are required to take the AP Exam in May.**

# MATHEMATICS

## **438 MIDDLE SCHOOL ALGEBRA** **Grade 7**

Grade 7 Mathematics classes at the O’Bryant will follow the Boston Public Schools Grade 8 curriculum by which students develop an understanding of important concepts, skills, procedures and ways of thinking and reasoning in number and operations, geometry, measurement, data analysis and probability and algebra. Students learn to link mathematics with other subject areas and to recognize similarities between problems and activities and their own aptitudes and interests. In the seven units of Number Sense students will learn to recognize and represent linear relationships in tables, graphs, words and symbols and solve one step linear equations, ordering and operations with fractions, decimals, integers and exponents (including order of operations) using *Thinking with Mathematical Models* as well as. In *Growing, Growing, Growing* students will learn to recognize and represent exponential growth and decay in tables, graphs, words and symbols. In *Looking for Pythagoras*, students will learn the Pythagorean Theorem, irrational numbers, connect coordinates, and about slope, distance and areas. In *Frogs, Fleas, and Painted Cubes* students will recognize and represent quadratic relationships in tables, graphs, and words. In *Say It with Symbols* students will learn equivalent expressions, solve linear equations and simple quadratic equations. In *Shapes of Algebra* students will learn how to solve linear systems and inequalities.

## **451 ALGEBRA 1** **Grades 8 and 9**

Algebra 1 is a first year course in algebra. It is designed for students who are entering high school with a substantial background in pre-algebra. Teachers design classroom experiences using an inquiry/ problem solving model of instruction that allows students to explore concepts from a variety of perspectives and representations. In each topic students learn to analyze and represent concepts numerically, algebraically, graphically, and linguistically. Students develop understanding of major topics in Algebra through a process that emphasizes communication, reasoning, and building connections between important algebraic concepts, additional strands of mathematics, and real world applications.

## **454 GEOMETRY** **Grades 9 and 10**

This is a full year, standards-based course of study in geometry with additional course work in probability. Teachers design classroom experiences using an inquiry/problem solving model of instruction that allows students to explore concepts from a variety of perspectives and representations. In each topic students learn to analyze and represent concepts numerically, algebraically, graphically, and linguistically. Students develop understanding of major topics in Geometry through a process that emphasizes communication, reasoning, and building connections between important geometric concepts, additional strands of mathematics, and real world applications.

**462 GEOMETRY HONORS**  
**Grades 9 and 10**

This is a full year, standards-based course of study in geometry. Teachers design classroom experiences using an inquiry/problem solving model of instruction that allows students to explore concepts from a variety of perspectives and representations. In each topic students learn to analyze and represent concepts numerically, algebraically, graphically, and linguistically. Students develop understanding of major topics in Geometry through a process that emphasizes communication, reasoning, and building connections between important geometric concepts, additional strands of mathematics, and real world applications. As this course is an HONORS level course, the pace will be accelerated and concepts will be explored in greater depth.

**456 ADVANCED ALGEBRA**  
**Grades 10 and 11**

Advanced Algebra is a standards based course in advanced algebraic reasoning, applications, and problem solving. The course is designed to prepare students for college algebra and/or precalculus. In this course, teachers design classroom experiences using an inquiry/problem solving model of instruction that allows students to explore concepts from a variety of perspectives and representations. In each topic students learn to analyze and represent concepts numerically, algebraically, graphically, and linguistically. Students develop understanding of major topics in Algebra through a process that emphasizes communication, reasoning, and building connections between important algebraic concepts, additional strands of mathematics, and real world applications.

**463 ADVANCED ALGEBRA HONORS**  
**Grades 10 and 11**

Advanced Algebra Honors is a challenging, standards based course in advanced algebraic reasoning, applications, and problem solving. The course is designed to prepare highly skilled mathematics students for calculus or precalculus honors. In this course, teachers design classroom experiences using an inquiry/problem solving model of instruction that allows students to explore concepts from a variety of perspectives and representations. In each topic students learn to analyze and represent concepts numerically, algebraically, graphically, and linguistically. Students develop understanding of major topics in algebra through a process that emphasizes communication, reasoning, and building connections between important algebraic concepts, additional strands of mathematics, and real world applications. As this course is an HONORS level course, the pace will be accelerated and concepts will be explored in greater depth.

## **458 PRE-CALCULUS**

**Grades 11 and 12**

Precalculus is a challenging, standards based course in reasoning, applications, and problem solving associated with algebraic functions. The course introduces students to topics in calculus that are associated with these functions. The course is designed to prepare students for calculus and includes with an introduction to limits and continuity. In this course, teachers design classroom experiences using an inquiry/problem solving model of instruction that allows students to explore concepts from a variety of perspectives and representations. In each topic students learn to analyze and represent concepts numerically, algebraically, graphically, and linguistically. Students develop understanding of major topics in algebra through a process that emphasizes communication, reasoning, and building connections between important algebraic concepts, additional strands of mathematics, and real world applications.

## **464 PRE-CALCULUS HONORS**

**Grades 11 and 12**

As this course is an HONORS level course, the concepts described in the regular Pre-Calculus course will be explored in greater depth and the pace will be accelerated.

## **45C DISCRETE MATHEMATICS**

**GRADE 12**

**Prerequisite: Precalculus**

Discrete Mathematics is a course designed for students who have made a commitment to become skilled in the ‘real life’ applications of the mathematics they have learned and will approach all topics with the view of their usefulness in the world. Discrete mathematics promotes a curiosity about the mathematics used in our daily lives. There is much logic-based application and a depth of understanding without the dependence of a formula based direction. The applications of calculus will be experienced using the graphing calculator. The course has a very strong emphasis problem solving, modeling, and data analysis. Throughout the course, students develop a firm grasp of the underlying mathematical concepts while using algebra as a tool for solving real-life problems.

## **459 CALCULUS**

**Grade 12**

**Prerequisite: Precalculus**

Calculus is a standards based course in the calculus of functions of one independent variable. The course is designed to assist students in completing a course of study addressing the four major concepts of calculus: limit, derivative, definite integral and indefinite integral. It is intended to prepare students for a university level calculus course. In this course, teachers design classroom experiences using an inquiry/problem solving model of instruction that allows students to explore concepts from a variety of perspectives and presentations. In each topic students learn to analyze and represent concepts numerically, algebraically, graphically, and linguistically. Students develop understanding of major topics in calculus through a process that emphasizes communication, reasoning, and building connections between important concepts in calculus and real world applications.

## **471 ADVANCED PLACEMENT STATISTICS**

**Prerequisite: See AP Protocol Sheet**

Statistics is the study of data emphasizing four major themes: exploratory analysis of data, planning and conducting a study, probability and distributions, and statistical inference. This course develops students' problem solving skills, enables them to be active and critical users of statistical information in daily life, improves their mathematical understanding as it relates to statistics, and facilitates students' use of technology (both graphing calculators and computer software) as a tool to explore statistical relationships. This course will cover the content of a one-semester introductory college course in statistics. **All students are required to take the AP Statistics Exam in May. This course is an elective. Students must also take the required math course for their grade.**

## **472 ADVANCED PLACEMENT CALCULUS AB**

### **Grade 12**

Advanced Placement Calculus AB is a standard based course in the calculus of functions of one independent variable. The class is designed to assist students in completing a course of study addressing the major concepts of calculus: limits, derivatives, and integrals. Using an inquiry/problem solving model of instruction, the classroom is designed to allow students to explore concepts from a variety of perspectives and representations. In each topic, students learn to analyze and represent concepts numerically, algebraically, graphically, and verbally. Students develop understanding of major topics in calculus through a process that emphasizes communication, reasoning, and building connections between important concepts in calculus and real world applications. This course is intended to prepare students for the Advanced Placement Calculus AB Examination in May. This class meets daily for one period. This course is equivalent to one semester of college calculus. **All students must take the Advanced Placement Calculus AB test in May given by the College Board.**

## **473 ADVANCED PLACEMENT CALCULUS BC**

### **Grade 12**

Advanced Placement Calculus BC is standards based course in the calculus of functions of one independent variable. The course is designed to assist students in completing a course of study addressing the major concepts of calculus: limits, derivatives, integrals, and series. This course covers all of the same concepts as AB Calculus plus additional topics within each concept. Using an inquiry/problem solving model of instruction, the classroom is designed to allow students to explore concepts from a variety of perspectives and representations. In each topic, students learn to analyze and represent concepts numerically, algebraically, graphically, and verbally. Students develop understanding of major topics in calculus through a process that emphasizes communication, reasoning, and building connections between important concepts in calculus and real world applications. This course is intended to prepare students for the Advanced Placement Calculus BC Examination in May. This class meets daily for two periods. This course is equivalent to two semesters of college calculus. **All students must take the Advanced Placement Calculus BC test in May given by the College Board.**

## **Roland Hayes School of Music Course Offerings:**

### **Band 1:**

This class will introduce the flute, clarinet, trombone, trumpet, and percussion instruments to students who have no prior experience studying a musical instrument. Students will learn technique, note reading, theory, and musicianship skills associated with the instrument of their choice. Material selected for the class will be based on the students playing ability.

### **Band 2:**

This is a performing ensemble class comprised of flute, clarinet, trombone, trumpet, and percussion. Students will improve their musical skills on their chosen instrument in preparation for numerous public performances throughout the school year. Individual and group instruction will be utilized. Material selected for the class will be based on the students playing ability. Prior experience on their musical instrument is required.

### **Guitar 1:**

This course is designed for students that have had no prior instruction in guitar playing. Students will learn basic reading and chord playing skills. An introduction to various guitar styles will be covered.

### **Guitar 2:**

This course is designed for students who have had one year of study on the guitar. Students will get more in depth instruction in various styles of guitar playing including blues, rock, rhythm and blues, reggae, jazz, and classical. There will also be more in depth study of music theory as it applies to guitar.

### **Guitar Ensemble:**

This class is designed for students with one or two years of study on the guitar. Students will learn pieces that involve each student or pairs of playing different parts. This group can also be referred to as a guitar orchestra.

### **Piano 1:**

An overall introduction to beginner piano playing with a concentration on reading music notation, understanding and executing basic rhythms, and playing familiar melodies. Students will start off by using one hand at a time and eventually move up to using both hands simultaneously.

## **Piano 2:**

A more advanced continuation of piano 1 which will include more intricate music reading, understanding of complex rhythms, and playing music that is more involved requiring both hands to play simultaneously. This will bring the student closer to selecting exactly what kind of pianist they would like to be; such as classical, jazz, pop rock etc.

## **Chorus 1:**

This course is designed to train beginning seventh grade students in the art of choral singing. Emphasis is placed on the development of tone production, posture, and articulation, breathing techniques and unison or two part repertoire acquisitions. An introduction to sight singing and music fundamentals will be presented. Attendance at concerts not during school hours may be required which will affect the grade given. Ample notice of such performances will be provided.

## **Chorus 2:**

This course is designed to train beginning and advanced eighth grade students in the art of choral singing. Emphasis is placed on the development of tone production, posture, articulation, breathing techniques and two or three part repertoire acquisition. An introduction to sight singing and music fundamentals will be presented. Attendance at concerts not during school hours may be required which will affect the grade given. Ample notice of such performances will be provided.

## **Music Technology:**

The music technology course is an introduction to computer-based music technology as used in the professional music world. Students will be assigned projects that they will create on industry-standard music software, while learning music fundamentals.

# NAVAL SCIENCE

The NJROTC program is a jointly sponsored Navy and secondary school program for students in grades 9 through 12. It is an accredited course of study taught at hundreds of public and private high schools nationwide by retired officers and enlisted personnel. The program is designed especially to assist the student in becoming a better-informed citizen, to encourage patriotism, and to develop self-discipline emphasizing a high degree of personal honor. NJROTC is open to all students and there is no military service obligation. Appointments to the Naval Academy and NJROTC college scholarships are available to outstanding NJROTC cadets. After successfully completing the three-year high school NJROTC Program, cadets desiring to enlist in the Navy can do so at the advanced pay grade of E-3 (Seaman), a head start toward future advancements and pay raises.

## **NAVAL SCIENCE 1**

### **Full Year Course**

The purpose of this course is to introduce cadets to the precepts of citizenship, the principles of good health and fitness, the elements of leadership, and the value of scholarship in attaining life goals. This course is also designed to engender a sound appreciation for the heritage and traditions of America, with recognition that the role of sea power will be important in America's future, and develop in each cadet a sense of pride in his/her organization, associates, and self. These elements are pursued at fundamental level.

## **NAVAL SCIENCE 2**

### **Prerequisite: Naval Science 1**

### **Full Year Course**

This course of instruction is designed to engender a sound appreciation for the heritage and traditions of America, with recognition that the historically significant role of sea power will be important in America's future, and develop in each cadet a growing sense of pride in his/her organization, associates, and self. The second portion of the course is an introduction to the sciences of maritime geography, oceanography, and meteorology.

## **NAVAL SCIENCE 3**

### **Prerequisite: Naval Science 2**

### **Full Year Course**

This course of instruction is designed to further develop the trait of leadership in NJROTC students and to introduce the cadets to the subjects of international law, sea power and national security, and naval operations and support functions.

## **NAVAL SCIENCE 4**

**Prerequisite: Naval Science 3**

**Full Year Course**

This course provides practical training with students applying previously learned leadership and management skills through hands-on experience in the administration and operations of the NJROTC corps of cadets. Students investigate naval officer commissioning programs and evaluate ethics for the junior officer in a leadership position.

## SCIENCE

### **55I PRINCIPLES OF ENGINEERING**

**Grade 9: – Engineering Pathway Students**

**Prerequisite: Acceptance into the Engineering Pathway Program**

**Full-Year Course**

Principles of Engineering is the first in a sequence of high-school, engineering courses that will prepare students for entry into a university/college engineering program. This *9<sup>th</sup> grade* course is only open to students participating in the Engineering Pathway program. This course will engage students in a series of hands-on, project-based experiences and will be coupled with Physics to form a double-period class. Students will learn Physics concepts and apply them to real-life, engineering projects. Students will be engaged in designing and building the following: robots, model bridges, underwater submersibles, water bottle rockets, science exhibits/artwork, and several digital electronic devices.

### **55A ADVANCED TOPICS IN SCIENCE - ROBOTICS**

**Grade 10 – Engineering Pathway students**

**Prerequisite: Principles of Engineering Course**

**Full-Year Course**

This is the second course in a sequence of high-school, engineering courses that will prepare students for entry into a university/college engineering program. This *10<sup>th</sup> grade* course is currently only open to students participating in the Engineering Pathway program. This course will engage students in the theory and practice of building robots. Students will be engaged in designing and building many different robots and will learn electronics, computer programming in C, and Computer Aided Design skills.

### **55C PRE-ENGINEERING**

**Grade 11 and 12**

This course provides students with an introduction to engineering design principles and exposes students to various engineering career opportunities. Students will design and build numerous projects during the course and will also learn how to use Computer Aided Design (CAD) software.

### **566 BIOLOGY 2**

**Grade: 11 and 12**

**Prerequisite: Biology 1**

This course provides an introduction to the biology of animals, the tissues and organ systems of humans, the theory of evolution and the types and classifications of animals. Students will be prepared to devise controlled multivariable experiments as well as apply biology principals and procedures to real life.

## **567 CHEMISTRY 2**

**Grade: 11 and 12**

**Prerequisite: Chemistry 1**

This is an accelerated course in Chemistry that explores the laws of matter including chemical and physical properties and changes. Matter is further viewed as solutions with densities, acids and bases relative to PH and atomic molecular structure. Relationships existing within the periodic table are used to explain this interaction via types of bonding. Using a variety of instructional tools, students will be prepared to devise controlled experiments as well as to appreciate and apply the principles of chemistry to real life situations.

## **571 ADVANCED PLACEMENT BIOLOGY**

**Grade: 11 and 12**

**Prerequisite: See AP Protocol Sheet**

This course follows the standards set by the College Board for Advanced Placement Biology. It is designed for those students who wish a challenging college level of biology class. Students will cover, in depth, all the major concepts and processes of biology with an emphasis on problem solving strategies and college level experiments. **All students are required to take the AP Exam in May.**

## **572 ADVANCED PLACEMENT CHEMISTRY**

**Grade: 11 and 12**

**Prerequisite: See AP Protocol Sheet**

**Full-Year Course**

This course follows the standards set by the College Boards for Advanced Placement courses. It introduces topics similar to those in a chemistry I college level program. Students are expected to spend extensive time studying in groups and doing extensive lab work. The course aims to provide students with the framework, factual knowledge, and analytical skills necessary to deal critically with the theoretical aspects of chemistry. Students will develop facility in dealing with chemical problems and develop their ability to express their ideas clearly, with clarity and logic.

The course will include the study of atomic theory and atomic structure, chemical bonding, nuclear chemistry, laws of ideal gases, kinetic molecular theory, liquids and solids, solutions, reaction types, stoichiometry, equilibrium, kinetics, thermodynamics and several descriptive aspects of chemistry. **All students must take the AP Exam in May.**

### **573 ADVANCED PLACEMENT PHYSICS B**

**Grade: 11 and 12**

**Prerequisite: See AP Protocol Sheet**

**Full-Year Course**

This course will develop the student's abilities to read, understand, and interpret physical information – verbal, mathematical, and graphical. To describe and explain the sequence of step in the analysis of a particular physical phenomenon or problem; that is, to describe the idealized model to be used in the analysis, including simplifying assumptions where necessary; state the principles or definitions that are applicable; specify relevant limitations on applications of these principles' carry out and describe the steps of the analysis, verbally or mathematically; and interpret the results or conclusions, including discussion of particular cases of special interest. Use basic mathematical reasoning – arithmetic, algebraic, geometric, trigonometric, or calculus, where appropriate – in a physical situation or problem. Perform experiments and interpret the results of observations, including making an assessment of experimental uncertainties.

**All students are required to take the AP Exam in May.**

### **574 ADVANCED PLACEMENT ENVIRONMENTAL SCIENCE**

**Grade: 11 and 12**

**Prerequisite: See AP Protocol Sheet**

The goal of the AP Environmental Science course is to provide 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 human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving and/or preventing them.

**All students are required to take the AP Exam in May.**

### **557 ANATOMY&PHYSIOLOGY (formerly Med Tech)**

**Grade: 11 and 12**

**Prerequisite: Biology and Chemistry**

This course applies the principles students learned in biology, health, and chemistry towards the function of the body in normal and abnormal conditions. The course explores the relationship between anatomy and physiology and the disease process.

**This is a laboratory-based course.**

### **55E BOITECHNOLOGY 1**

**Grade 11 and 12**

**Prerequisite: B- or better in Biology and Chemistry**

This course applies the general principles from cell biology and molecular biology to solve problems in the natural world. This course explores the basic relationships between living organisms and their uses. Molecular biology and cell structure will be emphasized.

**This is a laboratory-based course.**

# **SOCIAL STUDIES**

## **237 World Geography Grade 7**

Students will study the physical geography of the world outside of the United States and North America and its impact on the lives of people throughout the world. Students will acquire the skills and utilize the tools of geographers as they learn how to conduct geographic inquiry. In doing so, they will learn how to ask geographic questions, acquire geographic information, organize geographic information, analyze geographic information...and then answer the geographic questions they have posed, always supporting their answers with substantial geographic evidence.

The following concepts are at the heart of each section of the World Geography course:

- The World in Spatial Terms
- Places and Regions
- Physical Systems
- Human Systems
- Environment and Society
- The Uses of Geography
- 

## **238 Civics in Action Grade 8**

The focus of the course is on:

- building students' mastery of challenging subject matter in civics and government
- preparing students for responsible citizenship; and
- involving students in civic action projects that promote and demonstrate good citizenship, community service, and personal responsibility.

The content is focused on developing and practicing essential citizenship skills (e.g., critical reading, discussion, debate, writing, collaboration, and decision-making) through the active exploration of a range of issues and ideas that are important to our local and national community and interesting to students.

## **251 United States & World History I Grade 9**

United States and World History I is a study of key aspects of state building, the development of technology, and globalization, as well as the creation of the United States in the 18<sup>th</sup> century. Comparisons of the early United States and other nation-states in Africa, Asia, and Europe in the early 19<sup>th</sup> century are examined as well as the development and increased significance of the United States on the world stage. Examples from various regions of the world will be used to illustrate themes from different historical periods and illustrate connections, comparisons, and conflicts in the world. In each case students will examine and understand events from multiple perspectives using both primary and secondary source materials.

## **252 United States & World History II**

### **Grade 10**

In addition to investigating key aspects of the 19<sup>th</sup> century world of industrialization and imperialism, an underlying theme of this course will be the creation of the United States, its similarities and differences with other nation-states, and the role of the United States in the world by the turn of the 20<sup>th</sup> century. The course will use central themes in United States and world history as organizing principles: development of states and/or empires, expansion of technology, extension of constitutional theories, and globalization of exchange and contact. Different regions of the world will be used to illustrate themes in different historical periods to demonstrate connections, comparisons, and conflicts in the world. In each case students will examine and understand events from multiple perspectives using both primary and secondary source materials.

## **253 United States & World History III**

### **Grade 11**

U.S. and World History III focuses on the development of the United States in the 20<sup>th</sup> century and its similarities and differences with other nation-states in Africa, Asia, Europe and the Americas. Major topics of study will include, but are not limited to: the World Wars and the Cold War, the Russian and Chinese Revolutions, the 1920's and the Great Depression, post WWII social and economic trends, civil rights and student movements, the technological revolution, globalization and the world since the fall of communism and 9/11. In each case students will examine and understand events from multiple perspectives using both primary and secondary source materials.

## **271 ADVANCED PLACEMENT UNITED STATES HISTORY**

**Prerequisite: See AP Protocol Sheet**

Advanced Placement United States History is a college level survey of U.S. History from European colonization to the present. The course uses both a chronological and thematic approach to the study of United States history with emphasis on both political and social history. Goals of the class include familiarizing student with all aspects of United States history, developing their analytical, organizational and writing skills and preparing the class for variety of instruction is employed including lecture and discussion, primary source reading and analysis, group work, projects and presentations. In addition, technology is infused throughout the curriculum through use of software prepared specifically for the course and the College Board web site. **All students are required to take the AP Exam in May.**

## **272 ADVANCED PLACEMENT EUROPEAN HISTORY**

**Prerequisite:** See AP Protocol Sheet

Advanced Placement European History is a college level survey of European History from 1450 to the present. The course uses both a chronological and thematic approach to the study of European history from the Renaissance to the European Union with emphasis on intellectual, cultural, political, social and economic history.

Goals of the class include familiarizing students with all aspects of European history, developing their analytical, organizational, writing and technology.

A variety of instruction is employed including lecture and discussion, primary source reading, observations and analysis, group work, projects and presentations. In addition, art, media and technology are infused throughout the curriculum. Students interested in enrolling in the course should have a strong background in United States and world history, good reading and writing skills and an interest in art and using technology to support teaching and learning. **All students are required to take AP Exam in May.**

## **273 ADVANCED PLACEMENT AMERICAN GOVERNMENT**

**Prerequisite:** See AP Protocol Sheet

Advanced Placement American Government course will give students an analytical perspective of government and politics in the United States. Topics include the constitutional underpinnings of United States government, political beliefs and behaviors as the foundation of United States political culture, the mechanisms that allow citizens to organize and communicate their interests public policy, and the study of the development of individual rights and liberties and how these impact United States citizens. Student goals include: to learn important facts, concepts, and theories pertaining to U.S. government and politics; to understand typical patterns of political processes and behavior and their consequences; to analyze and interpret basic data relevant to U.S. government and politics. **All students are required to take AP the Exam in May.**

## **274 ADVANCED PLACEMENT ECONOMICS**

**Prerequisite:** AP Protocol Sheet

Advanced Placement Microeconomics is a college level survey course of the principal concepts and theories of microeconomics. Students will learn about inflation, the stock market and how businesses and consumers make decisions. Major topics covered will include supply and demand, consumer choice, production, competition, labor markets and the role of the government. Students will be assessed using a range of approaches including the creation, interpretation and analysis of graphical sketches. Mathematics will play an important role in economic analysis and interpretation. A goal of the class will be preparing students to perform well on the Advanced Placement exam as well as develop a strong understanding of economic principals. Students interested in studying business are encouraged to apply. **All students are required to take the AP Exam in May.**

## **25K ECONOMICS**

**Prerequisite:** Grade 11 and 12

**Semester/Half-Year Course**

In this course, students will examine the basic concepts in the economic process with special emphasis on the American economy and its financial institutions. Students will investigate the workings of the market system, banking, supply and demand, pricing, employment, unionism, the stock market, and international trade. Special emphasis will be placed on the role of government and the consumer in securing economic growth and stability.

### **257 AFRICAN-AMERICAN HISTORY**

**Prerequisite: Grade 11 and 12**

**Semester/Half-Year Course**

In this course, students will examine the history of African-Americans from the earliest beginnings in Africa to the current status of African Americans in the United States. Emphasis will be placed on the political, economic and cultural contributions of African-Americans in America. Topics will include Africa's history, geography and culture, tribalism, the slave trade, slave revolts and abolitionism, the Civil War and its aftermath, Reconstruction, segregation, the struggle for a "dream", and the legacies of African-American leaders politics, society, and culture.

### **25N SOCIOLOGY**

**GRADE 11 and 12**

**Semester/Half-Year Course**

In this course, students will examine the principles concepts and methods that comprise the scientific study of sociology. Topics will include the various forms of social structure, the role of cultural diversity in a society; the role of the economy and politics in society; the role of education and religion in society; the changing family structure, and the importance of how the individual works within societal groupings.

### **29P CONTEMPORARY GLOBAL ISSUES, 1968-PRESENT**

**Grade 11 and 12**

**Semester/Half-Year Course**

In this course students will investigate contemporary issues by looking at cases in Africa, the Americas, Asia, and Europe and focus on peoples' attempts to have control in their communities. Students will consider changing definition of communities as people see to solve problems relating to access to adequate food, health care and other life's necessities and to overcome unfair systems that have led to injustice, overpopulations, and political corruption. Major topics include: the revolutions of 1968 and the creation of both local and global communities, the globalization of the economy, revolutions of 1989, a comparison of life in capitalist and post-communist societies, the mal distribution of resources at the beginning of the 21<sup>st</sup> century, and the relationship between Christian and Islamic societies. Students will participate in a Model United Nations simulation as a culminating activity.

## **259 LATIN AMERICAN HISTORY**

**Grade 11 and 12**

**Semester/Half-Year Course**

In this course students will investigate Latin American history, from ancient civilizations to the present. Students will decide on topics to be studied in a global context, with a strong focus on research, analysis and writing skills. Discussions, debates, and simulations will be major learning methods in this class. Major topics: the growth, evolution and collapse of indigenous civilizations; the arrival of European explorers and the notion of “discovery”; European conquest and colonization; slavery; world economics; revolutions, independence and nation building; imperialism; the “Banana” Republics, Latin American culture and society, and contemporary issues and challenges in the 21<sup>st</sup> century.

# WORLD LANGUAGES

## **35A CHINESE I GRADES 9 and 10**

This beginning Chinese class will cover topics in the following areas: Pinyin (phonetic system), tone marks (pitch of sound), pictographs (picture writing), radicals (basic elements of Chinese writing), dictionary skills (number and order of strokes), characters (reading and writing), grammar (basic structures), communicative competence (application of knowledge in listening, speaking, reading, and writing), and art and culture (exploring and appreciating the Chinese way).

## **35B CHINESE II GRADES 10 and 11**

This second year Chinese will continue develop student's communicative skills in listening, speaking, reading and writing. Extensive practice will ensure student's fluent pronunciation and accurate tone pitch. The time for reading and writing Chinese in characters is increased. Additional studies of history and culture will also be implemented in order to bring the language and culture alive.

## **35C CHINESE III GRADES 11 and 12**

This third-year Chinese course will continue to develop the student's communicative skills in listening, speaking, reading and writing. More complicated sentence patterns and grammar will be included. Students will be expected to write short compositions in characters. Classroom instructions will be in the target language. Additional studies of the history and culture will also be implemented in order to bring the language and culture alive

## **35 F FRENCH I GRADES 9 and 10**

In alignment with the Massachusetts World Languages Framework and the City of Boston World Languages Learning Standards, the French 1 course is designed to allow students to complete stage 1 strands in the six areas of culture, connecting, listening, speaking, reading and writing. Students will explore the fascinating world of Francophone countries through the acquisition of its language. Students will learn to communicate in order to survive and thrive in a non-English environment. An atmosphere of risk-taking will be evident and encouraged as students develop language expression. Technology will play an intricate part as a learning tool in accessing the real world of Spanish- speaking countries. Students entering the course with previous exposure to the French language, as well as novice learners will benefit from each other and expand their knowledge of the French language and culture.

**35G FRENCH II**  
**GRADES 10 and 11**

In alignment with the Massachusetts World Languages Framework and the City of Boston World Languages Learning Standards, the French 2 course is designed to allow students to complete stage 2 strands in the six areas of culture, connecting, listening, speaking, reading and writing. Students will explore the fascinating world of Francophone countries through the acquisition of its language. Students will learn to communicate in order to survive and thrive in a non-English environment. An atmosphere of risk-taking will be evident and encouraged as students develop language expression. Technology will play an intricate part as a learning tool in accessing the real world of French - speaking countries.

**35H FRENCH III**  
**GRADES 11 and 12**

This course is a proficiency-assessed, communicative-based class designed for students who are studying French for the third year. In alignment with the Massachusetts World Languages Framework and the City of Boston World Languages Learning Standards, the French 3 course is designed to allow students to complete stage 3 strands in the six areas of culture, connecting, listening, speaking, reading and writing. Advanced vocabulary and syntax are taught and the cultures of various groups of French speakers are explored in depth. The emphasis is on communicative competency

**35I SPANISH I**  
**GRADES 9 and 10**

In alignment with the Massachusetts World Languages Framework and the city of Boston World Languages Learning Standards, the Spanish 1 course is designed to allow students to complete stage 1 strands in the six areas of culture, connecting, listening, speaking, reading and writing. Students will explore the fascinating world of Spanish speaking countries through the acquisition of its language. Students will communicate in order to survive and thrive in a non-English environment. An atmosphere of risk-taking will be evident and encouraged as students develop language expression. Technology will play an intricate part as a learning tool in accessing the real world of Spanish-speaking countries. Students entering the course with previous exposure to the Spanish language, as well as novice learners will benefit from each other and expand their knowledge of the Spanish language and culture.

### **352 SPANISH II GRADES 10 and 11**

In alignment with the Massachusetts World Languages Framework and the city of Boston World Languages Learning Standards, the Spanish 2 course is designed to allow students to complete stage 2 strands in the six areas of culture, connecting, listening, speaking, reading and writing. Students will explore the fascinating world of Spanish speaking countries through the acquisition of its language. Students will communicate in order to survive and thrive in a non-English environment. An atmosphere of risk-taking will be evident and encouraged as students develop language expression. Technology will play an intricate part as a learning tool in accessing the real world of Spanish-speaking countries. Students entering the course with previous exposure to the Spanish language, as well as novice learners will benefit from each other and expand their knowledge of the Spanish language and culture.

### **353 SPANISH III GRADES 11 and 12**

This course is a proficiency-assessed, communicative-based class designed for students who are studying Spanish for the third year. In alignment with the Massachusetts World Languages Framework and the city of Boston World Languages Learning Standards, the Spanish 3 course is designed to allow students to complete stage 3 strands in the six areas of culture, connecting, listening, speaking, reading and writing. Advanced vocabulary and syntax are taught and the cultures of various groups of Spanish speakers are explored in depth. The emphasis is on communicative competency.

### **366 SPANISH II HONORS GRADES 10 and 11**

As these courses are Honors courses, the instruction is at a greater pace and intensity than regular Spanish 2 and 3. The emphasis is on speaking, reading and writing competencies.

### **356 SPANISH FOR NATIVE SPEAKERS 1**

These courses are content-based programs for students who are native speakers of Spanish. Typically, these students' strengths lie in listening and speaking, but they need reinforcement in grammar, writing and reading. This course will use the content areas – Social Studies, Latin American History, and Literature – to build on those skills. Our curriculum will comply with the City of Boston Learning Standards as well as the Massachusetts Foreign Languages Frameworks.

### **357 SPANISH FOR NATIVE SPEAKERS 2**

These courses are content-based programs for students who are native speakers of Spanish. Typically, these students' strengths lie in listening and speaking, but they need reinforcement in grammar, writing and reading. This course will use the content areas – Social Studies, Latin American History, and Literature – to build on those skills. Our curriculum will comply with the City of Boston Learning Standards as well as the Massachusetts Foreign Languages Frameworks.

### **373 ADVANCED PLACEMENT SPANISH LANGUAGE**

Advanced Placement Spanish Language is an intensive course in which students are highly motivated and have already learned grammar and developed their proficiency in all four language skills: writing, reading, speaking and understanding Spanish. It is designed to help the learner perfect and enhance these skills. Students will continue to increase their understanding of the Hispanic culture and will be encouraged to pursue the study of Spanish in college. Our curriculum will comply with the City of Boston Learning Standards as well as the Massachusetts Foreign Languages Frameworks. **All students are required to take the AP Exam in May.**