



CATS ACADEMY BOSTON

CURRICULUM GUIDE 2019/20



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Our Mission Statement CATS Boston Academy

CATS Academy Boston offers an American co-educational college preparatory boarding and day program (grades 9-12) for a predominantly international cohort of students who are linguistically, culturally, and academically diverse.

Focusing on the needs of each individual, CATS helps students realize their full potential and attain admission to the college choice that is right for them. CATS provides a supportive learning community where all students receive the necessary guidance to achieve their goals, aided by a personalized learning plan.

CATS also helps students to develop by nurturing strong English language skills along with creative and critical thinking skills, which they often have not experienced in their previous educational systems. The school's strong academic, social development, and extracurricular programs – delivered by highly talented and committed staff – provide for the needs of the whole student body.

This holistic approach enables the international student body not only to gain entry to, but also to succeed in, American colleges and universities and to become well-informed, ethical global citizens and leaders.



GRADUATION REQUIREMENTS

CATS Academy's academic program is arranged around required core courses and a range of electives. To graduate, students will be expected to have completed the following at minimum:

- English Literature- 4 years
- ESL (English as a Second Language)- up to 4 years
- Arts - 1 year
- World Languages - 3 years for all native English speakers
- Mathematics - (Algebra I, Geometry, Algebra II) - 4 years
- Science - 3 years (including 2 years of a lab science)
- Social Sciences/History - 3 years (including one year of US History)

HONORS AND ADVANCED PLACEMENT (AP) COURSES

Honors courses offer highly motivated students an opportunity to study a specific course in greater depth and at a faster pace. Students in Honors courses are expected to produce more work and to develop higher level critical thinking skills.

Advanced Placement courses are college level courses that prepare students to take College Board exams in May to establish advanced placement in college courses or credit toward a college degree. Department approval is required for enrollment in Advanced Placement courses. Most American universities take AP results into consideration in the admissions process.

CATS Academy offers the following Advanced Placement courses:

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|---|-----------------------------------|
| AP Studio Art: 2-D Design | AP Statistics |
| AP Studio Art: 3-D Design | AP Computer Science A |
| AP Studio Art: Drawing | AP United States History |
| AP Art History | AP European History |
| AP English Language and Composition | AP Human Geography |
| AP Biology | AP Macroeconomics |
| AP Chemistry | AP Microeconomics |
| AP Environmental Science | AP Spanish Language and Culture |
| AP Physics C: Electricity and Magnetism | AP Spanish Literature and Culture |
| AP Physics C: Mechanics | AP French Language and Culture |
| AP Calculus AB | |



CREATIVE ARTS

Performing Arts

Drama

Actors' Studio (one or two semester course)

Students develop their dramatic, expressive skills while exploring themselves as actors, writers, and communicators. Through improvisational theater exercises, students explore their creative expression and movement. Through reading, examining, and performing monologues and short scenes from a wide range of theatrical work, students experience the full range of human emotions from comedy to tragedy. Throughout the rehearsal process, students develop theater technique and understanding of blocking and staging. Their work culminates with a performance presentation of work studied in class.

Theatre Production (year-long course; also a CATS Innovation course)

In this course, students develop the necessary skills needed to operate all technical aspects of theater. This includes but is not limited to set design and construction, lighting design and operation, props design and construction, sound, and stage management. Students learn how to safely use the tools necessary for set construction. Students apply their skills by aiding in the design and construction of the fall and spring productions. This project-based course gives students a greater understanding of the scope of talents and skills needed to produce a theatrical production. Students see tangible and concrete results through the application of their work, problem solving, and collaboration with the class and the performers in the capstone events of final performances for the CATS community.

Acting for Film (one semester course)

In this course, the students develop skills needed for film and TV. They learn about the industry and the expectations and standards of casting and performance. Students critically assess the performances of fellow and celebrity actors. They develop and create their own acting video audition piece. Students leave the class with a solid repertoire built on their acting skills and have an audition reel that they will be able to send to colleges.

Music

Chorus (year-long course)

Students learn to sing music of all styles (pop, rock, jazz, musical theater, classical) with others in unison and in harmony. The chorus performs at least two times per year with repertoire they rehearse each semester. Throughout this course, students develop an understanding of their voice, healthy vocal technique, sight-singing and music notation reading skills, exercises to develop the voice, and an overall sense of musicianship. This course is open to students of all ability levels, and students who have never sung in an ensemble before are encouraged to join!



Piano 1 (semester course)

Students learn the basics of playing piano and develop their musicianship. Reading music notation, ear training, music theory, piano exercises, and sight reading at an introductory level are all important elements of the Piano 1 course. Students play from repertoire of varying styles and eras. Class sizes are small to maximize individual instruction, and students play in both an individual and group setting. Performance is optional, but encouraged, for Piano 1 students.

Piano 2 (semester course)

Prerequisite: Piano 1 or Audition by the Instructor

Students build on their pre-existing piano skills and continue to develop their musicianship. Reading music notation, ear training, music theory, piano exercises, and sight reading at an intermediate level are all important elements of the Piano 2 course. Repertoire for this course is partially based on student interest, including pieces from varying styles and eras. Class sizes are small to maximize individual instruction, and students play in both an individual and group setting. Performance is optional, but encouraged, for Piano 2 students.

Piano 3 (semester course)

Prerequisite: Piano 2 or Audition by the Instructor

Students work towards an advanced level of proficiency on piano and become well-rounded musicians. Piano 3 is heavily theory, exercise, and sight-reading focused to foster well-rounded musicians capable of using their piano abilities in various settings. Repertoire for this course is mostly based on student interest, including pieces from varying styles and eras. Class sizes are small to maximize individual instruction, and students play in both an individual and group setting. Performance is required for Piano 3 students.

Piano 4 (semester course)

Prerequisite: Piano 3 or Audition by the Instructor

Students play advanced repertoire of their choosing and begin composing their own music, building on previous theory knowledge. Students will sight read and play keyboard exercises proficiently. This course is designed around the interests of each student and includes a high level of one-to-one instruction. Performance is required for Piano 4 students.

Business of Music (one semester course; also a CATS Innovation course)

Prerequisites: ESL Level 3 or higher

Students explore the backbone of the music industry, learning about copyright law, band deals, and music promotion. They look at music icons and how artists rise to fame. The class utilizes social media to promote art and music in our student body and manages a Facebook page, CATS Café.

**Music Technology and Production (year-long course; also a CATS Innovation course)****Prerequisites:** ESL Level 3 or higher

Students learn to compose and produce music using the same programs that are used in the music industry. From EDM, to jazz, to rock and roll, we pick apart many different genres and learn how to recreate some of the greatest hits of all time. The class also teaches composition skills. Prior piano experience is a plus, as much of this class is based around the keyboard.

Instrumental Ensemble (year-long course)**Prerequisites:** Instrumental Audition and Instructor approval

Student instrumentalists play in groups to study some of the greatest composers in history and enhance their musicality. This course explores the music spanning the past 300 years, covering music icons from Bach, to Mozart, to Gershwin, and more. There are multiple opportunities for the students to share their work to the school with performances throughout the year.

Visual Arts**AP Art History (year-long course)****Prerequisite:** ESL Level 5

AP Art History students probe art's formal and cultural past from prehistoric times through the present day. The class is organized into chronological themes, such as Art and Spirituality, Converging Cultures, Realism vs. Idealism, and Creating Identities. Participants learn to critically analyze a variety of media- from painting to photography to performance art. Students not only learn to write about art but in addition keep a sketchbook and explore different styles and techniques through hands-on assignments. The class makes frequent visits to art museums and galleries in the area. Students leave with a new understanding of the importance of art as a universal human phenomenon.

AP Studio Art: 2-D Design**AP Studio Art: 3-D Design (year-long course)****AP Studio Art: Drawing****Prerequisite:** Instructor approval**AP 2-D Art and Design, AP 3-D Art and Design and AP Drawing**

Through studio practice, application of design concepts, and informed decision-making, students assemble a body of artwork that demonstrates a high level of quality and growth of content, technique, and process. Students develop mastery in concept, composition, and execution. All students enrolled in these AP art courses are required to submit their portfolio to the College Board for grading and possible college credit. The AP Art portfolios will each consist of two sections: 1. **Sustained Investigation:** Students will submit 15 digital images of art and design projects that exhibit a persistent exploration of concept, technique and execution. 2. **Selected Works:** *AP 2-D and Design and AP Drawing* students will submit 5 works which demonstrate



skilful synthesis of materials, processes, and ideas. *AP 3-D Art and Design* students will send 10 digital images of five works (two views of each) that demonstrate skilful synthesis of materials, process, and ideas. This course is rigorous and students must be willing to make a commitment to the completion of a strong portfolio.

Graphic Design (one semester course offered both semesters; also a CATS Innovation course)

The purpose of this course is to introduce students to elements of graphic design. Students utilize computer programs from the Adobe Creative Cloud such as Photoshop and Illustrator. Class projects include poster design, photo manipulation, logo design, and creating a business identity. Students learn valuable skills in color, composition, and typography and the importance these have on creating eye-catching design.

Digital Photography and Video Production (one semester course offered Fall 2019; also a CATS Innovation course)

Students learn about photographic composition, light manipulation, and elements of design, and they develop skills in digital imaging using the *Adobe Suite* in the Innovation lab. In addition, students learn how to develop a storyline, record an event, or promote an idea using the media of film. Skills in editing are learned on *Final Cut Pro* and other digital programs. In addition, students learn about the history of film. Student produced films are presented to the school community in an end of the term Film Festival as a capstone project and viewed on social media.

Creating Comics 1! - Introductory Level (one semester course offered both semesters; also a CATS Innovation course)

This course is an introduction to creating comics. Students learn effective visual storytelling techniques, how to compose a comic page, and how to create a visually entertaining story. Traditional materials such as pencil and ink are used to develop comic illustrations. Students work from assigned scripts as well as write and draw their own five-page comic. Creative writing, composition, anatomy, and fine art drawing skills are developed as students explore the art of creating comics.

Creating Comics 2! – Advanced level. (one semester course; also a CATS Innovation course)

Pre-requisite: Comics1

In this advanced-level course, students learn effective visual storytelling techniques, how to compose a comic page, and how to create a visually entertaining story. In addition to traditional materials like pencil and ink, students also use Adobe Photoshop in the innovation lab to digitally color their work. The capstone project for this course is a fifteen-page comic that is uploaded online. Creative writing, composition, anatomy, and advanced drawing skills are developed as students explore the art of creating comics. Student works will be viewed on the internet.

Introduction to Fashion Design: Reclaimed Materials (year-long course; also a CATS Innovation course)

In this project-based course, students learn the basics of sewing, garment construction, and inspiration-based design. Units include learning both machine and hand sewing; an introduction to pattern-making and garment creation; and designing a mini collection from which students will select one design to make for an end-of-term fashion show. Second



semester, students create a garment from reclaimed materials, utilizing the skills they learned first semester, and then develop a second garment based on a theme chosen by the class. Integrated in the garment curriculum, students learn about fashion history, including notable designers of the past.

Advanced Fashion I: Sustainability (one semester course Fall 2019; also a CATS Innovation course)

Pre-requisites: Intro to Fashion Design or Instructor Approval) Fall Part 1

Through a crash course students will be re-introduced to sewing, pattern-drafting, and design, before embarking on a semester long project designing, developing, and executing a class collection comprised entirely from recycled and unconventional materials. Expectations include two garments: one created from recycled textiles and one created from unconventional materials.

Advanced Fashion II: Marketing and Technology (one semester course Spring 2020; also a CATS Innovation Course)

Prerequisites: Advanced Fashion I or Instructor Approval

In this class, students experience working at a fashion school level to learn brand development and what it is like to collaborate within a team in the fashion industry to develop a collection. Students begin the semester by producing two sketchbook design/inspiration projects. They then break into groups to design and develop cohesive collections. Students assume responsibility for creating a brand name, logo, and collection title, as well as design and construct one look per groupmate. Students interact with the music production class to create music for the runway show and the photography class to stage both an editorial shoot and marketing campaign for their collections. Lastly, students are responsible for generating one 3-D printed accessory to go with their collection.

Advanced Fashion: Construction (one semester course)

Prerequisites: Introduction to Fashion Design or Instructor approval

This course gives students who have taken *Introduction to Fashion Design* the opportunity to develop their sewing skills and learn new techniques. Students learn French draping, how to alter patterns, when to use a wide range of fabrics, and how to improve their fashion drawing skills. Key projects include developing a portfolio of fashion designs and creating a mini-line for a photo shoot and runway show.

Costume Design and Construction (one semester course offered both semesters; also a CATS Innovation course)

This is a course where students design and create costumes for the Fall Play or Spring Musical. Students collaborate with the Theatre Production class, the actors, and the director to create costumes, which function well for the actors, complement the set design, and enhance the production. Be inspired to invent fabulous, imaginative costumes for our CATS theatre.



Textile Design (one semester course offered Spring 2020)

Students learn various textile development and modification techniques, as well as textile properties. Textile development includes knitting, dyeing, and printing as well as various fabric modifications. Students utilize their skills to create an end of the term garment.

Studio Art: Introduction to Drawing (one or two semester course)

Introduction to Drawing is a studio course that introduces students to the comprehensive visual language of drawing. Various projects and presentations expose students to numerous drawing approaches, including ways of structuring the picture plane, creating believable space with linear perspective, and modelling form with shading. Students apply these skills to idea generation, form development, experimental variations on a design, investigative studies of creative problem-solving, and expressions of movement and spatial illusion. Using a variety of media, students draw from observation and are introduced to the processes involved in planning, researching, and actualizing a major drawing project. Critiques and lectures help students develop an understanding of the critical issues of drawing and of its context within the history of art. PowerPoint presentations, the Internet, and field trips to museums and galleries further students' understanding of historic and contemporary art. Each student submits a final portfolio of work developed throughout the semester to fulfill the course requirements. Suggested readings include *The Language of Drawing* by Edward Hill, *Drawing on the Right Side of the Brain* and *Color* by Betty Edwards, *The Natural Way to Draw* by Kimon Nicolaides, and *The Art of Drawing* by Bernard Chaet.

Studio Art: Introduction to Painting (one or two semester course)

The purpose of the course is for students to explore, experiment, and become familiar with the medium of paint; to build skills of observation; and to learn to create form and materiality of simple and complex objects through paint. Students build an understanding of the properties of color, composition, and perspective and develop an understanding of basic design terminology used to express visual ideas and concepts. Students are introduced to examples of historic and contemporary painting through PowerPoint, reproductions in books, the Internet, and visits to art museums and galleries. Midterm and final portfolios of work produced throughout the semester are required of all students to successfully fulfill course requirements. The portfolio is evaluated on the effort and the quality of the work completed. Suggested readings include *The Language of Drawing* by Edward Hill, *Drawing on the Right Side of the Brain* and *Color* by Betty Edwards, *The Natural Way to Draw* by Kimon Nicolaides, and *The Art of Drawing* by Bernard Chaet.

Studio Art: Advanced Drawing and Painting (year-long course)

Prerequisite: Instructor approval

Advanced Drawing and Painting is a studio course which gives advanced art students an opportunity to explore the combined visual languages of drawing and painting. Students develop their skills of self-expression through assigned, independent, self-directed, and collaborative projects. Students further their understanding of how to structure the picture plan, create believable space with linear perspective, model form, and understand the properties and materiality of paint. Students apply these skills to idea generation, form development, experimental variations on a design, investigative studies of creative problem solving, and expressions of movement and spatial illusion. Using a variety of media, students draw and paint from observation and are encouraged to develop their personal voice. Critiques and



lectures help students develop an understanding of the critical issues of drawing and painting and of its context within the history of art. PowerPoint presentations, the Internet, and field trips to museums and galleries further students' understanding of historic and contemporary art. Each student submits a mid-year and final portfolio of work to fulfill the course requirements. Suggested readings include *The Language of Drawing* by Edward Hill, *Drawing on the Right Side of the Brain* and *Color* by Betty Edwards, *The Natural Way to Draw* by Kimon Nicolaides, and *The Art of Drawing* by Bernard Chaet.

Computer-Aided Design (CAD) (one semester course offered both semesters; also a CATS Innovation course)

In this course students learn introductory CAD skills to aid them in the drafting, designing, and engineering process. They learn basic concepts, processes, and skills required of architectural and industrial design professionals. Students design virtual objects and print them on a 3D printer. They begin by designing a piece of furniture. Students are introduced to set design for theatre, and by the end of the class, students will have all of the skills necessary to digitally design their "dream house."

Printmaking Survey (one semester course)

In this survey of printmaking techniques, students learn a variety of print methods, including monotype, collagraph, relief, screen-printing, and photo-etching. From painterly prints to linocuts to original designs on tee shirts, students gain a well-rounded understanding of some of the most popular methods of making prints. Through these studio processes, they learn how to combine techniques, use studio equipment, and develop new, original creative content. Independent final projects demonstrate these skills, with which students will create a suite of prints suitable for inclusion in college application portfolios.

English Literature

English Skills

The English Skills course introduces students to literary terms and practices, enabling them to succeed in their future study of English Literature. The class builds a foundation for approaching academic writing and the close reading of texts. Texts may include *Brown Girl*

Dreaming and *Cyrano de Bergerac*, as well as fables, folktales, various short stories and poetry from authors such as Neil Gaiman, Richard Connell, Annie Proulx, Ethel Rohan, Raymond Carver, and Shel Silverstein.

Society and the Individual, Journeys, Independence, and Critical Lenses are offered at both the College Prep and Honors levels. Honors sections assume more background knowledge, move at a quicker pace, cover additional material, and expect students to work at a higher level relative to College Prep sections.

Literature 1: Society and the Individual

The course provides freshmen students with a comprehensive introduction to academic writing and literary analysis, beginning with a full review of syntax and grammar rules. The literary component of the class examines texts and identifies themes, which address the role of individual responsibility, and teaches students how to use literature as a lens through



which they may better understand society and their roles within the global community. Possible texts may include *The Curious Incident of the Dog in the Nighttime*, *Lord of the Flies*, *The House on Mango Street*, and *A Streetcar Named Desire*.

Literature 2: Journeys

This course examines characters' physical, emotional, and spiritual journeys in literature. The course begins with essential vocabulary and a review of grammatical rules, then progresses to comprehension and textual analysis. Public speaking assignments give students the opportunity to practice their English speaking skills and develop confidence in their ability to engage a crowd of peers. Texts for this course include *Romeo and Juliet*, the *Odyssey*, *Things Fall Apart*, *Chronicle of a Death Foretold*, *Persepolis*, and various short stories and poems.

Literature 3: Independence

This course examines the theme of independence by looking at universal ideas which incited The American Revolution or inspired Transcendentalism. Students work to create their own independence in writing projects, while developing critical thinking and analytical skills. Texts studied in this course may include *The Narrative of the Life of Frederick Douglass*, *The Great Gatsby*, *The Crucible*, and a variety of shorter works by authors such as Dickinson, Thoreau, Emerson, and Poe.

Literature 4: Critical Lenses

This course focuses on analyzing literature through the critical lenses of feminism, Marxism, and psychoanalysis. Students work on identifying and analyzing the reasons for an author's choices and the effectiveness of various means of persuasion and on understanding how critical lenses are employed to interpret texts. Students work towards mastering the critical reading and writing skills necessary for university. Texts studied in this course may include *Sir Gawain and the Green Knight*, *The Canterbury Tales*, *A Midsummer Night's Dream*, *The Strange Case of Dr. Jekyll and Mr. Hyde*, and shorter works by authors such as Keats, Shelley, Blake, and Orwell.

AP Language and Composition

Prerequisites: Returning students: A- or higher in previous Honors British or Honors American Literature; a sample of analytical writing submitted to the English Department Chair; completion of significant summer assignment; approval of the previous instructor. New students: approval of English Department Chair based upon placement test scores and previous English grades.

The Advanced Placement (AP) course in English Language and Composition teaches students to become skilled readers of prose and skilled writers, who compose literature for a variety of purposes. They develop an awareness of a writer's purpose, audience expectations, and genre conventions.

**Creative Writing (one or two semester course)****Prerequisites:** Grade 10 or above; ESL Level 4 or higher

We read poems and stories to find something in them that startles us, makes us more aware of the world we live in, makes us more aware of who we are, makes us more alive. In Creative Writing, we read notable poems and stories from the 20th and 21st Centuries so we can learn from great writers' examples and so we can enter this conversation with the world around us that has been going on for hundreds, even thousands of years. We learn how to craft deeper poems than we have been able to write before by learning elements of form, image, voice, line, music, and mystery. By learning such elements of fiction as character development, plot arc, conflict, and symbolism, we will shape stories that move us, surprise us, and transform us into different people than we were before we read them. By the end of the course, students will have built a good-sized portfolio of works that shows their progress as writers, thinkers, and creators—works they're proud of—so they can see where they're going as artists and where they've been. We will write poems and stories that shape the way we and others see the world.

Social Justice Literature – A Look at Critical Issues and Current Events through a Discussion of Young Adult Novels (one or two semester course offered both semesters: also a CATS Innovation Course)**Prerequisite:** ESL 4

Literature has long been used as a way of exploring and discussing issues of injustice and inequality. From the classic *Of Mice and Men* to the more modern *The Hate U Give*, literature gives voice to the voiceless and forces the reader to confront challenging issues of racism, sexism, classism, and how the issues that divide us are, all too frequently, the issues that matter most. In this class, students explore specific issues of social justice and diversity linked to Young Adult Novels that *explore* those topics in a meaningful way. Texts may include *The Hate U Give*, *Turtles All the Way Down*, and *All American Boys*. This course should leave students with the language to discuss these issues and the tools to question and confront their own preconceived notions and prejudices.

English as a Second Language (ESL)**ESL Level 2****Prerequisites:** Test results for ESL Level 2 using a secure placement test administered by CATS Academy Boston (new students only) or successful completion of CATS Extra course at CATS

The English as a Second Language (ESL) Level 2 course is specifically designed for international students who are at a *HIGH BEGINNING* comprehension level of the English Language and who plan to continue with their education in a US/UK university/college, where English is the medium of instruction. Using the latest technology, the students focus on work in vocabulary, grammar, pronunciation, reading and listening comprehension, writing, and speaking. The course introduces students to American idiomatic expressions and helps them understand spelling rules. Students are introduced to new vocabulary and practice using new vocabulary in writing and speaking, while interacting in the class or working on individual or group research projects. The course also helps students to learn about and better understand American culture. The course is built on *Pathways 1: Listening and Speaking* and *Pathways 1: Reading and Writing* with an on-line workbook (Cengage). The course is based on using the latest technology and may include various individual and group activities, original streaming news, authentic audio and video materials, and publications that



relate to topics covered in the textbook and reflect everyday life and cultural events in the US and worldwide. There is required reading and writing homework, including work on-line, and there are tests and quizzes in class to work on test-taking strategies.

ESL Level 3

Prerequisites: Test results for ESL Level 3 using a secure placement test administered by CATS Academy Boston (new students only) or successful completion of the ESL Level 2 course at CATS

The English as a Second Language (ESL) Level 3 course is specifically designed for international students who are at an *INTERMEDIATE* comprehension level of the English Language and who plan to continue with their education in a US/UK university/college where English is the medium of instruction. It focuses on improving and further developing students' ability in English for Academic Purposes (EAP), with the emphasis on grammar, reading, writing, speaking, listening comprehension skills, academic English vocabulary, researching, and applying those skills to students' own subjects. Students work on understanding spoken and written English and on developing the ability to speak and write clearly and effectively. Students learn vocabulary and presentation skills, increase writing and thinking skills developed in English, and apply critical thinking and writing skills to a variety of academic assignments, including analyzing texts. They work on grammar and academic vocabulary development. In addition, the course includes extended work on academic English and TOEFL vocabulary, pronunciation skills, conversational English, and the use of idiomatic expressions. There is required reading and writing homework, including work on-line, and there are tests and quizzes in class to work on test-taking strategies. The course is built on the *Focus on Grammar* (FOG) Level 3 Student Book textbook (Pearson) and an on-line application, Membean, to address students' individual learning needs in expanding their vocabulary. It prepares students for future TOEFL examination and is based on using the latest technology. It may include various individual and group activities, original streaming news, authentic audio and video materials, and publications that relate to topics covered in the textbook and reflect everyday life and cultural events in the US and worldwide. There is required reading and writing homework, including work on-line, and there are tests and quizzes in class to work on test-taking strategies.

ESL Level 4

Prerequisites: Test results for ESL Level 4 using a secure placement test administered by CATS Academy Boston (new students only) or successful completion of ESL Level 3 course at CATS

The English as a Second Language (ESL) Level 4 course is specifically designed for international students who are at the *HIGH INTERMEDIATE* comprehension level of the English Language and who plan to continue with their education in a US/UK university/college where English is the medium of instruction. It helps students to build confidence in proper use of academic English grammar, enrich their academic English vocabulary, and practice the command of academic English. While the main focus of the ESL Level 4 course is to work on English grammar and vocabulary, the course is also aimed at further developing and mastering students' advanced skills in English for Academic Purposes (EAP): writing, reading, speaking, listening comprehension, researching, and applying those skills to the students' own subjects. Students continue working on understanding spoken and written English and the ability to speak and write clearly and effectively. Students acquire more sophisticated academic English vocabulary and presentation skills, improve writing and thinking skills developed in English, and apply critical thinking and writing skills to a variety of academic assignments, including analyzing complex texts. In addition, the course prepares for the TOEFL examination, includes extended work on academic English and TOEFL vocabulary, pronunciation skills, conversational English, and the use of idiomatic expressions. There is required reading and writing homework, including work on-line, and there are tests and quizzes in class to work on testing-taking strategies. The course is built on *Focus on Grammar* (FOG) Level 4 with *My English Lab* textbook (Pearson) and an on-line application, Membean, to address students' individual learning needs in mastering their vocabulary and NoRedInk to



improve grammar use. It further prepares students for future TOEFL examination and may include various individual and group activities, original streaming news, authentic audio and video materials, and publications that relate to topics in the textbook and reflect everyday life and cultural events in the US and worldwide.

ESL Level 5

Prerequisites: Test results for ESL Level 5 using a secure placement test administered by CATS Academy Boston (new students only) or successful completion of ESL Level 4 course at CATS

The English as a Second Language (ESL) Level 5 course is specifically designed for international students who are at an *ADVANCED* comprehension level of the English language and who plan in the future to continue with their education in a university or college where English is the medium of instruction. It helps students to build confidence in academic writing and master the command of academic English. While the main focus of the ESL Level 5 course is mastering academic writing using proper English grammar along with academic English vocabulary, the course is also aimed at developing and enhancing other skills in English for Academic Purposes (EAP): writing, reading, speaking, listening comprehension, researching skills, and applying those skills to students' own subjects. Students master their understanding of spoken and written English and ability to speak and write clearly and effectively. Students enrich their academic vocabulary and presentation skills, increase critical thinking skills developed in English, and apply critical thinking and writing skills to a variety of academic assignments, including analyzing complex texts. In addition, the course prepares for the TOEFL examination including extended work on academic English and TOEFL vocabulary, pronunciation skills, conversational English, and the use of idiomatic expressions. There is required reading and writing homework, including work on-line, and there are tests and quizzes in class to work on test-taking strategies. The course is built on the *Elements of Success 4 (Grammar for Writing)* textbook (Oxford University Press) and on-line applications, Membean to address students' individual learning needs in mastering their vocabulary and NoRedInk to improve grammar use. The course prepares students for future TOEFL examination and may include various individual and group activities, original streaming news, authentic audio and video materials, and publications that relate to topics in the textbook and reflect everyday life and cultural events in the US and worldwide. There is required reading and writing homework, including work on-line, and there are tests and quizzes in class to work on test-taking strategies.

CATS Extra

Prerequisites: Test results using a secure placement test administered by CATS Academy

CATS Extra is an academic year-long program offered to rising 9th and 10th graders whose English language proficiency is below the minimum requirements necessary for admission into CATS Academy Boston. This program is for highly motivated students who consistently work hard and have high expectations of being successfully mainstreamed into CATS Academy Boston during the following academic year.

CATS Extra Communication

In this course, students build language, critical thinking, and writing skills by developing their English language ability in the areas of speaking, pronunciation, listening, note-taking, reading, writing, and grammar. This class prepares students to succeed in future mainstream courses. Course content includes a range of activities that helps students feel comfortable



communicating in academic and social situations. Activities include presentations and speeches, persuasive speaking and writing, storytelling, role-plays, and the study of history and culture. Lessons develop the language skills, critical thinking, and learning strategies required for academic success. Using authentic and relevant content, the course prepares students to work effectively and confidently in an academic environment. Class materials include blended learning resources from Oxford University Press and National Geographic Learning/Cengage.

CATS Extra Academic English

CATS Extra Academic English is designed for international students at beginning comprehension levels of English who plan to take the TOEFL examination in order to study in a US college. The course includes instruction and practice in reading, writing, listening, speaking, grammar, academic vocabulary, critical thinking, and idioms. Students develop language skills in reading comprehension and reading strategies, spelling ability, vocabulary expansion, the writing of various sentence types and paragraphs, and the use of appropriate grammar in real life contexts. Additionally, students become familiar with the academic writing process. Lessons develop the language skills, critical thinking, and learning strategies required for academic success. Using authentic and relevant content, the class prepares students to work effectively and confidently in an academic environment. Class materials include blended learning resources from Oxford University Press and National Geographic Learning/Cengage.

CATS Extra Literature 101

CATS Extra Literature 101 is an introductory literature course that utilizes ESL skills and strategies such as predicting, skimming, making inferences, and understanding text references in order to aid students in their English language acquisition. Student-centered activities incorporate speaking, listening, reading, writing, and grammar exercises throughout the course. The most frequently used literary terms are introduced, practiced, and reinforced throughout this course. As a result, students expand both their passive and active vocabulary knowledge. This enables them to retain more information, read faster, and understand and communicate more fully when they speak, listen, read, and write. In this class, students are introduced to literary terminology and literature. Often working in pairs and groups, students also demonstrate understanding of the course material by doing research, writing reports, making posters, and giving presentations. Course materials include adapted literature resources from Pearson Longman and Oxford University Press.

CATS Extra Social Science

CATS Extra Social Science prepares students for success in a social studies program with a broad overview of world and American history. The class focuses on developing strong reading and note-taking skills, and students are asked to undertake research, write reports, and give oral presentations. Activities are designed for students in the early stages of English language acquisition and help build content knowledge, skills, and learning strategies. Instruction includes material on reading strategies, interpreting maps, timelines, charts, and graphs, as well as vocabulary-building activities and glossaries. Course materials include adapted resources from Pearson Longman and Phoenix.

CATS Extra Integrated Mathematics

Building on the math knowledge that CATS Extra students already have, Integrated Mathematics advances students' math knowledge in the areas of geometry, algebra, trigonometry, discrete mathematics, and probability and statistics. The



theme of the course is patterns. Students create, model, analyze, and explain the different patterns that occur in each of the math disciplines. Connections are explored between the different areas of mathematics so that students understand how each can be represented as a data table, equation, picture, and description. Students complete projects throughout the year to demonstrate their understanding of the concepts. In this way, students expand their mathematical vocabulary and communication skills while furthering their study of mathematics.

CATS Extra Integrated Science

In CATS Extra Integrated Science, students learn how to think, investigate, and communicate as scientists. The goal is to be able to read, write, and speak well about science. To accomplish this, students read and discuss ideas from the textbook and also look at, listen to, and watch the world around them. Students ask questions about what they see and hear, make guesses about the answers to these questions, and design experiments to test their hypotheses. Finally, students share and communicate the results of their experiments with their fellow scientists through oral presentations and in writing.

Health and Wellness

In line with the School's Mission to educate the whole child, CATS Academy offers a Health and Wellness program that emphasizes the importance of knowledge, attitudes, and practices relating to personal health and wellness. The course is designed to expose students to a broad range of issues and information relating to various aspects of personal health including nutrition, physical fitness, drugs, tobacco, alcohol, and sexuality. Students also take CPR as part of the course. In addition to these topics, students participate in a Physical Education class once a week as a requirement of this course. All students in grades nine and ten take a one-semester Health and Wellness course.

Mathematics

CATS Extra Integrated Mathematics

Building on the math knowledge that CATS Extra students already have, Integrated Mathematics advances students' math knowledge in the areas of geometry, algebra, trigonometry, discrete mathematics, and probability and statistics. The theme of the course is patterns. Students create, model, analyze, and explain the different patterns that occur in each of the math disciplines. Connections are explored between the different areas of mathematics so that students understand how each can be represented as a data table, equation, picture, and description. Students complete projects throughout the year to demonstrate their understanding of the concepts. In this way, students expand their mathematical vocabulary and communication skills while furthering their study of mathematics.

Integrated Mathematics I

In this course, students study the foundations of Algebra and Geometry. Students build an understanding of variables, expressions, and equations. They learn to write and solve linear equations and then apply equations to angles, triangles,



and polygons in Geometry. Students learn to work with equations of lines and segments on the coordinate plane, as well as solve systems of equations using various methods. Students also explore basic statistics.

Integrated Mathematics II

Prerequisites: Integrated Math I or Placement Test

In this course, students continue their study of Algebra and Geometry, completing the second semester of each subject. Students study similarity, right triangles, trigonometry, area, and volume. They also study exponents, quadratic functions, and polynomials. Students continue their study of statistics, including probability, and explore patterns and sequences as well.

Geometry College Prep

In this course, students explore shapes and their relationships to the two and three-dimensional world. Topics include triangles, quadrilaterals, polygons, circles, area, volume, congruency, similarity, and trigonometry. Students pay particular attention to measurements and calculations of real world applications. This course also further develops students' algebraic skills as students apply their Algebra I knowledge to geometric concepts.

Geometry Honors

Prerequisites: B+ or better in Algebra I and recommendation of teacher. ESL Level 3 or higher.

The Geometry Honors course covers the same material as the Geometry CP course but moves at a faster pace and introduces additional topics. There is an increased emphasis on formal geometric proofs and logic. Theorems, postulates, and axioms are discovered and applied to proving why other concepts are true.

Algebra II College Prep

Prerequisites: Successful completion of Algebra I and Geometry

This course builds on what students have learned in Algebra I. Students in the course develop advanced algebra skills such as solving systems of equations, factoring advanced polynomials, and understanding imaginary and complex numbers. Students also study matrices, rational functions, and conic sections. The focus for all of the topics is on problem-solving and developing formal mathematical language in English. The mathematical training in this course is important as preparation for the ACT and SAT, as well as future courses in Pre-calculus and Calculus. The text for the course is *Big Ideas Math: Algebra II*, and the course makes use of the TI-84 graphing calculator.

Algebra II Honors

Prerequisite: Returning students: Recommendation of current math teacher; New students: Placement test results

The Honors Algebra II course covers the same material as the Algebra II CP class but moves at a faster pace and covers additional topics. Honors students also receive more challenging assignments and projects with the goal of developing their critical thinking skills and formal mathematical thought processes.

**Pre-Calculus CP**

Prerequisite: Successful completion of Algebra II

This course provides students with the skills they need to study calculus. It highlights the key methods from algebra, trigonometry, and geometry that are needed for further study. The central unifying concept is the mathematical function. The course focuses on both conceptual understanding and problem solving ability and provides students with a deep understanding of exponential, logarithmic, polynomial, rational, and inverse functions. It also offers an introduction to sequences and series. The textbook for the course is *Functions Modeling Change: A Preparation for Calculus 5th* ed. by Connally *et. al.*, and the course makes extensive use of the TI-84 graphing calculator.

Pre-Calculus Honors

Prerequisites: Returning students: A- or higher in Algebra II College Prep; B or higher in Algebra II Honors; ESL Level 3 or higher; recommendation of previous instructor. New students: ESL Level 3; successful completion of Algebra II; placement test results.

The Honors Pre-Calculus class covers the same material as the College Prep class but moves at a faster pace and covers additional material as a preview of calculus. Some additional topics include polar functions, sequences and series, and an introduction to limits and derivatives. Honors students also receive more challenging assignments and projects with the goal of further developing their critical thinking and logic skills and keeping them fully engaged.

Discrete Mathematics CP

Prerequisites: Successful completion of Algebra II or instructor approval

Discrete Math utilizes a first year college textbook and provides an introduction to a survey of topics in mathematics, including problem solving, set theory, logic, number theory, probability, statistics, and graph theory. Students have not previously had the opportunity to study this content in the Algebra, Geometry, and Algebra II sequence. This greatly enhances students' understanding of topics included in the broader field of mathematics. Students taking this course enhance their ability to make sense of problems and persevere in solving them, reason abstractly and quantitatively, construct viable arguments and critique the reasoning of others, model with mathematics, use appropriate tools strategically, and look for and express regularity in repeated reasoning.

History of Mathematics (also a CATS Innovation Course)

Pre-requisites: ESL 4 or higher; completed Algebra II with a B or higher

Through this course students gain a greater appreciation of mathematics as a human endeavor created by a diverse group of individuals whose life experiences and environments are integrally tied to the discoveries they made. An historical perspective is applied to analyze the conventions and norms of communication adopted by mathematicians, the messages these norms convey, and their implications for the role of mathematics in society. Students focus on the development of the number systems, the development of algebra, and math in modern society.



Introduction to Abstract Mathematical Thought Honors

Prerequisite: Recommendation of current math teacher

Introduction to Abstract Mathematical Thought provides an introduction to a survey of topics not previously covered in the traditional high school algebra to calculus sequence, including formal logic, set theory, number theory, and graph theory. This greatly enhances students' understanding of topics included in the broader field of mathematics. While the topics in this course have some overlap with those covered in Discrete Mathematics, there is a much greater focus on constructing formal mathematical proofs. Students will learn a variety of proof-writing techniques and approaches, including direct proof, proof by contradiction, proof by contrapositive, and proof by induction and disproof by counterexample. By viewing the mathematical world as a series of conjectures that must be proven or disproven, as opposed to theorems that are simply applied, students gain an insight into and appreciation for how the mathematics was developed. By the end of the course, students will have developed both the skills and mindset necessary for discovering new mathematics. Students use the textbook: *Chapter Zero: Fundamental Notions of Abstract Mathematics* by Carol Schumacher.

Calculus Honors

Prerequisites: Returning students: Recommendation of previous instructor. New students: ESL Level 3; placement test results

Calculus Honors is an introduction to differential and integral calculus with a single variable. Students are introduced to limits, derivatives, integrals, the fundamental theorem of calculus, the mean value theorem, differential equations, optimization problems, and a variety of other topics and their applications to real-world problems. The course includes most of the material in AP Calculus but at a more relaxed pace, and the AP exam is not a component of this course.

AP Calculus AB

Prerequisites: Returning students: ESL Level 4 or higher; A- or higher in previous course; recommendation of previous instructor. New students: ESL Level 4; placement test results

Students prepare for the Advanced Placement Test in order to gain college credit while learning topics in Single Variable Calculus. Students are introduced to limits, differential equations, the derivative, points of tangency, slope fields, optimization problems, the fundamental theorem of calculus, mean value theorem, integration, application of calculus, and a variety of other topics that will provide real world examples as to the importance of calculus. The textbook for the course is Rogawski's *Calculus for AP*. Taking the Advanced Placement test is a mandatory component of this course. Upon completing this course, students are eligible to take Multivariable Calculus or an independent study in mathematics.

Multivariable Calculus Honors

Prerequisite: Successful Completion of AP Calculus AB and recommendation of Calculus Instructor

Students in this course continue their study of calculus begun in AP Calculus AB and complete their preparation for the BC level of the Advanced Placement examination in calculus to be taken in the spring. Coverage includes integration by parts and by partial fractions, improper integrals, first order separable differential equations, infinite series and power series, and parametric and polar coordinates. Students continue their study of mathematics by extending their knowledge to the calculus of three-dimensional space. Partial differentiation and multiple integration are the main areas of study. Students must have a TI-84 Plus graphing calculator and must take the College Board BC Calculus exam at the end of the year.



Introduction to Statistics

Prerequisites: successful completion of Algebra II

This course provides a basic introduction to statistics. It is recommended for students who are interested in business, social science, human resources, and criminal justice, and it provides an excellent preparation for any career. Topics include descriptive statistics, probability, probability distribution, normal distribution, hypothesis testing, estimates and sample sizes, the chi square distribution, correlation, and regression. The course is a critical thinking course as well as an analytical one, where students do many short-term projects and a long-term project. This course also provides an overview on how to collect, analyze, interpret, and display data from various real life sources and topics, emphasizing pop culture, politics, and the sporting world.

Statistics Honors

Prerequisites: Returning students: A- or higher in CP Math course; B or higher in previous Honors Math course; ESL Level 3 or higher; recommendation of previous instructor. New students: ESL Level 3; placement test results

Students expand their understanding of data collection and the role of statistics in making inferences from data. Applications from many realistic contexts such as business and economics, the social and physical sciences, healthcare, education, engineering, and leisure activities are examined throughout the course. Students use realistic data that they collect and analyze for class assignments and projects. The course includes most of the material in AP Statistics but at a more relaxed pace, and the AP exam is not a component of this course.

AP Statistics

Prerequisites: Returning students: ESL Level 4 or higher; A- or higher in previous math course; recommendation of previous instructor. New students: ESL Level 4 and placement test results

The purpose of AP Statistics is to demonstrate a range of relevant everyday issues that can be addressed with the help of statistical analysis. This course is meant to expand the understanding of data collection and the role of statistics in making inferences from data. Applications from many realistic contexts such as business and economics, the social and physical sciences, healthcare, education, engineering, and leisure activities are examined throughout the course. Students use realistic data that they collect and analyze for class assignments and projects. Preparation towards the AP Examination highlights the four major disciplines within the Statistics class: Exploring Data, Sampling, Probability, and Inference. The primary textbook used is *The Practice of Statistics for AP*, 4th Ed. by WH Freeman. Students also use the following resources: www.collegeboard.com and www.apstatsmonkey.com and use TI-84 Plus C Silver Edition Calculators.

Game Theory (one semester course; also a CATS Innovation course)

Prerequisites: ESL Level 3 or higher; Algebra I; instructor approval

Game theory utilizes both popular and more contrived games as well as an accessible text to provide a fun and engaging introduction to the fundamentals of strategic decision-making. Through the analysis of games, students begin to understand the different roles that players can take, the behavior that constitutes the optimal strategy for playing these roles, and the behavior that constitutes the optimal strategy for assisting or countering these roles. Using this knowledge, students interpret the current behavior of teammates and/or opponents in an attempt to determine their roles, recall the



optimal strategy associated with these roles, predict the future behavior of other players based on their optimal strategy, formulate their own optimal strategy to best assist teammates and/or counter opponents, recall the role associated with this strategy, and implement the strategy by behaving in accordance with the calculated role. Furthermore, students gain an appreciation for how these concepts can be applied to fields including but not limited to business, economics, political science, computer science, logic, biology, and philosophy.

Applications of Game Theory: Traditional Game Design (also a CATS Innovation course)

Prerequisites: Game Theory or permission from instructor

Using concepts learned in Game Theory, students research popular board games with the aim to design, refine, and construct an original board game. Additionally, students learn how to sell a refined and marketable game to a publisher. This process is ultimately split into four major phases: research, development, refinement, and sale.

Science

ESL General Science

Prerequisite: Enrollment in ESL Level 2

This course is a broad survey of science topics. During the course of the year, students look at three broad units on the fundamental concepts and vocabulary of chemistry, physics, and biology. In addition to reading conducting exercises from our textbook, students are engaged in using and developing the skills of science. These include, but are not limited to, making observations, forming questions and hypotheses, conducting experiments and research, analyzing results, and presenting conclusions in both written and oral formats.

Biology College Prep

Prerequisites: Returning students: recommendation of previous instructor. New students: placement test

College Prep Biology gives a general overview of topics in biology as well as the practice of science in general. Through coursework students learn classical biology content as well as recent developments in the field. Instructors integrate hands-on/minds-on activities, seminar-style discussions, group work, and direct instruction to reach these goals. The course also focuses on questions of how science is performed and how scientists make discoveries by including topics in the history of biology and by encouraging students to develop a scientific mind frame and to continue on as lifelong science learners. Topics include Inquiry and the Scientific Method, Life Fundamentals and Biochemistry, Cell Structure and Function, Heredity, Molecular Genetics, The Human Body and Homeostasis, Human Reproduction and Development, Evolution, and Ecology.

Biology Honors

Prerequisites: ESL level 3 or higher. Returning students: recommendation of previous teacher. New students: placement test

In Honors Biology as a one-year course, we take a hands-on collaborative approach to doing projects and experiments in biology. Topics include, but are not limited to, cellular structure and functions, genetic materials and regulation, ecosystems, energy cycles and habitat conservation, and evolution of organisms and their physiology. Although we utilize a textbook as a primary source, current topics from scientific literature are used in research and discussions. By the



conclusion of this course, students should not only be able to understand processes of biology but to think like a scientist, design experiments, and problem solve as a group.

AP Biology

Prerequisites: ESL Level 3 or higher; A- or higher in CP Biology or Honors Biology at CATS or another American school. Returning students: recommendation of current or previous instructor. New Students: placement test

AP Biology is a one-year intensive course designed to mirror a college-level introductory biology course. Students learn a wide range of biological concepts, principles, and skills that prepare them for future learning in biology and the sciences in general. Students also prepare to take the AP Biology exam at the end of the year. The AP Biology curriculum is based on four big ideas called “enduring understandings.” These big ideas can be distilled down to evolution, energy flow, genetics and heredity, and interactions and ecology. Throughout the course, these big ideas permeate all topics and serve to connect all concepts. Students spend about 30 per cent of class time performing labs. There are 13 inquiry-based labs that are emphasized for AP Biology. Labs require a large amount of autonomy from students and are student-driven. These labs give students experience with everything from animal behavior to mathematical modelling to advanced biotechnology techniques and help to reinforce the four big ideas of the course. By the end of the year, students are not only equipped to perform well on the AP Biology exam but will have a very solid foundation in their biology and science education as they continue through high school and into college.

Chemistry College Prep

Prerequisites: ESL Level 2 or higher. Returning students: recommendation of previous instructor. New Students: placement test

This class is an introduction to chemistry and problem solving and is offered for students with rudimentary English. Students gain a good understanding of the methods and principles of modern chemistry and develop strong analytical problem-solving skills. Course topics include states of matter, atomic theory, periodicity of elements, chemical bonding, stoichiometry, intermolecular forces and physical changes in matter, gas laws, thermodynamics, kinetics and equilibrium, acids and bases, and oxidation-reduction.

Chemistry Honors

Prerequisites: ESL Level 3 or higher; previous Algebra experience. Returning students: recommendation of previous instructor. New Students: placement test

Chemistry Honors is a challenging college-preparatory course that studies the physical structure of matter, its interactions through chemical reactions, and the role of energy in these interactions. Classroom discussions, group activities, demonstrations, practice in analytical problem-solving, and laboratory investigations are emphasized throughout this course. Course topics include states of matter, atomic theory, periodicity of elements, chemical bonding, stoichiometry, intermolecular forces and physical changes in matter, gas laws, thermodynamics, kinetics and equilibrium, acids and bases, and oxidation-reduction. Students gain a good understanding of the methods and principles of modern chemistry and develop strong analytical problem-solving skills. In addition, students are eligible to take AP Chemistry or Biology and the SAT II subject test in Chemistry.

**AP Chemistry**

Prerequisites: ESL Level 3 or higher; A- or above in CP Chemistry or B+ or higher in Honors Chemistry; concurrent enrollment in Pre-Calculus or above. Returning students: recommendation of previous instructor. New students: placement test

AP Chemistry is the equivalent of a first year college level chemistry class. This course builds on concepts developed in Chemistry or Honors Chemistry by going into greater depth and detail in such areas as chemical reaction mechanisms, chemical equilibrium, reaction rates, acid-base chemistry, and electrochemistry. Class discussions, laboratory investigations, and analytical problem-solving are emphasized throughout the course. The laboratory portion of AP Chemistry introduces students to a variety of analytic chemistry techniques and makes use of the Vernier LabQuest Data collection system for plotting and analyzing data. All students are required to take the AP Chemistry exam in May.

Food and Medicine – An Organic Chemistry Approach (one semester course) CATS Innovation Course

Prerequisites: Previous Chemistry, ESL 3

This class is designed to familiarize students with the basic chemical principles of food and medicine and how they affect our body and overall health. This class will benefit students who are interested in health-care related fields. Students learn the basic organic chemistry of food and medicine. This includes the production, classification, transformation, preservation, and utilization of food stocks in the US and around the world. The chemistry and production of common medicine and pharmaceuticals is introduced, as well as the discovery of antibiotics, anti-cancer drugs, and other life-saving/changing medicines. This course also looks at the basic principles of pharmacology to show students how medicine interacts with our body.

Organic Chemistry (one semester course)

Pre-requisites: Chemistry, ESL 3

This class is designed to mimic a college level Organic Chemistry I class with an emphasis on students' understanding of the basic principles of organic molecules and their reactions, especially those involved in life process. Topics include basic nomenclature, functional groups and chemistry, structural, region- and optical isomerism, and basic organic synthesis and molecules that change our life. This class can also benefit students who want to pursue a career in medicine or health-care related fields.

Environmental Science College Prep (year-long course; also a CATS Innovation course)

Prerequisites: Returning students: Recommendation of previous instructor. New students: placement test

The goal of the Environmental Science course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world. Students' focus and work aim to identify and analyze environmental problems both natural and human-made and to examine alternative solutions for resolving or preventing them. Using an interdisciplinary approach, the course embraces a wide variety of topics from different areas of study. Several themes unite the learning including energy conversions; Earth as one interconnected system; human alterations of natural systems; environmental problems framed in a cultural and social context; and the development of practices aimed at achieving sustainable systems. With a focus on hands-on learning, the course aims to



encourage students to explore the natural world, create questions and ways for exploring those questions, develop possible solutions to problems, and implement these solutions in their local and global environment.

Environmental Science Honors (year-long course; also a CATS Innovation course)

Prerequisites: Returning Students: Recommendation of previous instructor. New Students: Placement test. All Students: ESL 3 or Higher, Minimum 2 of 3 of the following science courses (Biology, Chemistry and/or Physics).

Environmental Science Honors challenges students to investigate and understand the diverse scientific principles that underpin an understanding of *all* forces that interact to produce physical and biological patterns in the environment. This is a more difficult and intensive investigation than the College Prep course and is intended for strong students. Students work to identify and analyse both natural and anthropogenic environmental challenges and explore strategies to address them. Using an interdisciplinary approach, the course embraces several different themes including energy conversions; Earth as an interconnected system; human-altered natural systems; environmental problems in their social and cultural contexts; and sustainability. Beyond understanding and exploring these concepts, a key goal for the Honors is to propose and devise solutions that may be implemented to tackle environmental challenges facing human societies and Earth's biosphere as a whole.

AP Environmental Science

Prerequisites: Biology, ESL Level 4 or higher and permission of the Instructor

The AP Environmental Science course is designed to be the equivalent of a one-semester, introductory college course in environmental science. Unlike most other introductory science courses, Environmental Science includes geology, biology, environmental studies, chemistry, physics, and geography. AP Environmental is a rigorous science course that stresses scientific principles and analysis and includes a laboratory component. Topics include Climate Change, Agriculture, Biomes, Weather, and the interaction of humans with our planet. This is an Advanced Placement class, and students are required to take the AP exam at the end of the course.

Entomology: The Study of Bugs (one semester course; Fall and Spring) CATS Innovation Course

Prerequisites: ESL 2 or above

Insects are everywhere in our modern world and in the history of mankind. Bees pollinate crops and allow our food to grow while making "the food of the gods", honey, to sweeten our life. Mosquitoes, flies, and other insects which carry disease have changed the course of human history and have devastated civilizations. Termites bother us as they use our houses to build their own. Caterpillars and butterflies enchant our dreams and our stories. Ants, bees, and termites built their own complex societies millions of years before our earliest ancestors and their 'cities' still dominate the environment today.

In this course, students learn about the structure, biology, physics, and behavior of insects. Students learn what makes an insect and insect, how insects 'see' and interact with the world, the benefits and limits of being small, the amazing superpowers of individual insects, and the world changing power of insect societies. Students learn a little about each of the 12 major groups of insects and how to identify them. They learn a little about insects' cousins, the spiders, crabs, scorpions, and other arthropods, and also look at how insects have both helped and bothered human societies for thousands of years. There are opportunities to learn how to collect and keep insect specimens.

**Genetics Honors (one semester course)**

Prerequisites: ESL Level 3 or higher. Returning students: recommendation of previous instructor. New Students: placement test

In this honors level course, we introduce students to a more in-depth subfield of Biology and take a comprehensive approach to learn content and cutting edge technology that is often depicted on crime shows such as CSI. Students work together on projects and laboratory experiments to understand topics such as inheritance, DNA and RNA, mutations and disease, forensics, epigenetics and gene regulation, genome sequencing, evolution, bioinformatics, and population genetics. We use a variety of teaching techniques including lecture, discussion, reading primary literature and the textbook, and doing group projects or role playing. By the conclusion of this course, students have a greater understanding of both the general aspects of genetics and the specific skills and problem-solving required of genetic research in a laboratory.

Physics College Prep

Prerequisites: ESL Level 3 or higher and current enrollment in Algebra II or higher. Returning students: recommendation of previous instructor. New students: placement test

This class is an introductory physics course taught at the high school level for students at the Intermediate level of English as a Second Language. Physics College Prep includes kinematics, forces, work, energy, power, circular motion and orbits, momentum, torque, and possibly an introduction to advanced topics as well. By the end of this course, students are able to interpret word problems and real-life situations and make quantitative statements relating physical quantities like location, velocity, acceleration, energy, and force to each other. Students are able to exercise independent thought in carrying out and devising laboratory experiments that confirm these relationships. Skills to be learned include the ability to solve word-based problems involving physical quantities, using techniques from geometry, trigonometry, and algebra and the ability to infer from primary data in laboratory experiments various physical constants and experimental parameters. Students are assigned individual work to be completed outside of class, as well as quizzes and exams.

Physics Honors

Prerequisites: ESL Level 3 or higher; current enrollment in Pre-calculus or higher Returning students: recommendation of previous instructor. New students: placement test

Honors Physics is a challenging introduction to physical reasoning. In this course, students study concepts including momentum, energy, forces, simple harmonic motion, and waves, along with how these concepts are related to one another. Although these topics overlap with those in College Prep Physics, the Honors class goes at a faster pace and in greater depth, so that students take away a deeper understanding of the material. Students also have an opportunity to research notable scientists who contributed to the development of the field and, time permitting, are introduced to ideas from relativity and quantum physics. In the laboratory component of the class, students learn about experimental design and data analysis while studying physical systems.

**Physics II College Prep: Optics, Heat, Electricity, and Magnetism
(one or two semester course)**

Prerequisites: Geometry; ESL3 or higher; prior content knowledge of physics that includes forces.



High school students are often exposed to mechanics topics repeatedly - including kinematics, forces, energy, and momentum - but do not often have the opportunity to learn a number of other interesting topics, which specifically also appear on the SAT Physics exam. This class covers the science of light (optics), heat (thermodynamics), waves, and the fundamentals of electricity and magnetism. This course is recommended for students who are interested in learning about these fascinating topics and/or are interested in preparing for the SAT Physics exam.

AP Physics C: Mechanics

Prerequisites: ESL Level 3 or higher; A- or higher in CP Physics or B+ in Honors Physics at CATS or another American school; previously completed or currently enrolled in Calculus. Returning students: recommendation of previous instructor. New students: placement test

AP Physics C: Mechanics is an Advanced Placement course taught at a college level and includes the use of calculus to study topics of physics. The level and use of calculus in this class necessitates that students have already taken a year of physics and either have completed a year of calculus or are taking calculus at the same time as Physics AP C. This is a laboratory-based course, and students are expected to spend about a quarter of their time on laboratory experiments. Topics that are covered in Physics AP C include kinematics; Newton's laws of motion; work, energy and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. By the conclusion of this course, students are able to solve mathematical, word-based, and real-life problems in physics.

AP Physics C: Electricity and Magnetism

Prerequisites: AP Physics C: Mechanics. Exceptions allowed with approval of instructor if students have had calculus and Honors Physics or higher in the past

AP Physics C: Electricity and Magnetism is an Advanced Placement course taught at a college level and includes the use of calculus to study topics of physics. This course is meant to be the companion and successor course to AP Physics C: Mechanics, covering a similar level of difficulty but with completely new content. The level and use of calculus in this class necessitates that students have already taken a year of advanced level physics and have completed a year of calculus. This is a laboratory-based course, and students are expected to spend about a quarter of their time on laboratory experiments. Topics that are covered in Physics AP C: Electricity and Magnetism include electric fields; electrical potential; flux; Ohm's Law, current, resistance; Lorentz force resistance and capacitors in circuits; and electromagnetic induction and inductors. By the conclusion of this course, students are able to solve mathematical, word-based, and real-life problems in physics.

Modern Physics (one semester course)

Prerequisites :Honors or AP Physics

The purpose of the Modern Physics class is to provide students with an introduction to some of the scientific breakthroughs and discoveries that took place starting at the beginning of the 20th century. Such topics include special and general relativity, the structure of an atom, basic quantum mechanics, astrophysics, and cosmology. The class will not be lab based. Instead, it will focus on class activities and calculations. Students will observe and take part in various visual demonstrations that help define modern physics concepts. They will also practice using mathematical formulas to calculate values such as time dilation and rates of radioactive decay. We will also occasionally discuss how certain ideas are portrayed in fictional works such as books and movies. Students should have already taken a course in honors or AP physics.

**Astronomy: Understanding our Solar System (one semester course; Fall 2019; also a CATS Innovation course)****Pre-requisites:** Completed or concurrently enrolled in Algebra 1. ESL 3 or higher.

This first course in Astronomy deals with the objects comprising the Solar System: the sun, planets, comets, moons, and asteroids. The course is structured in three parts. The first part helps students understand the vast scales of distance in the Solar System and the history and importance of astronomy in different societies. In the second part, students examine the formation and characteristics of the objects in our Solar System as well as the exploration of these bodies. The third part covers the necessities for life generally and the search for life in the Solar System. The objective is for students to gain a quantitative and qualitative understanding of Astronomy. Their gained familiarity with mathematical concepts such as Orders of Magnitude, Dimensional Analysis, and the use of ratios to compare quantities can be used in the study of other scientific fields.

Biomechanics (one semester course; also a CATS Innovation course)**Prerequisites:** General Science and ESL 3 or higher

This Biomechanics course provides valuable information for athletes and animal lovers alike. If you are interested in the way animals and humans use their bodies to move, this course is for you. Topics studied include basic physics, muscles and skeletons, locomotion and exercise as well as how we move blood around our bodies. Students view videos and perform many fun and interesting demonstrations and activities as they learn about these subjects. The course ends with a final project on a Biomechanical challenge from our everyday world.

Social Science**World History College Prep****Prerequisites:** ESL Level 2 or higher; placement test results

World History is a one-year social science course for ninth graders at CATS Academy Boston. Over two semesters, it examines cultural and historical issues that are relevant in the world today. This course emphasizes academic skills, especially reading, writing, and note-taking. Students use statistics, maps, primary sources, images, and reference materials. Content includes an introduction to Judaism, Islam, Christianity, and the history of the Middle East. Activities include visits to local churches, mosques, and temples. This course helps students see how individuals like themselves shape history and community.

World History Honors**Prerequisites:** ESL Level 3 or higher; placement test results

World History Honors is a one-year social science course for ninth graders at CATS Academy Boston. Over two semesters, it examines cultural and historical issues that are relevant in the world today. This course emphasizes academic skills, especially reading, writing, and note-taking. Students explore the relationship between themes and details, relevance, sequence, and investigation. They use statistics, maps, primary sources, images, and reference materials. In addition, World History Honors students do more advanced reading and writing assignments. Content includes an introduction to



Judaism, Islam, Christianity, and the history of the Middle East. Activities include visits to local churches, mosques, and temples. This course helps students see how individuals like themselves shape history and community.

ESL United States History

ESL History is a one-year course in American history for students in tenth or eleventh grade who are at ESL Level 2. After one semester, students with an A in ESL US History may transfer to US History Survey CP. After passing two semesters of ESL United States History, students are not required to take US History Survey CP, but they must take a year of either Facing History CP or Economics CP in order to graduate. ESL United States History has a more basic text than the college prep courses, and its reading and writing assignments are not as advanced. Like the US History Survey courses, ESL United States History focuses on themes and relevance.

United States History Survey College Prep

Prerequisites: ESL Level 3 or higher

United States History Survey is a one-year social science course for tenth graders or new eleventh or twelfth graders. This course is required for all CATS Academy Boston students as part of their three-year social science requirement for graduation. It helps students be successful in college-level social science courses or AP United States History. US History Survey takes a thematic approach to US history, surveying topics like immigration, reform, civil rights, national government, race, and gender in United States history. Events are studied for relevance to today's issues. Excerpts from films, books, and primary sources present different perspectives on the past. United States History Survey students develop skills of note-taking, analytical reading, writing, and research.

United States History Survey Honors

Prerequisites: ESL Level 3 or higher; History and Human Behavior Honors with a grade of B or above; History and Human Behavior CP with a grade of A- or above; recommendation of instructor and Social Science department chair. New students must have these grades in history courses at previous school and recommendation of instructor and Social Science department chair.

United States History Survey Honors is a one-year honors social science course that meets the US history graduation requirement from CATS. It is open to qualified tenth graders and new eleventh or twelfth graders. This course helps students be successful in college-level social science courses or AP United States History. United States History Survey Honors takes a thematic approach to US history, examining topics like immigration, race, gender, reform, civil rights, national government, imperialism, and overseas commitments in US history. Events are studied for relevance to today's issues. Excerpts from films, books, and primary sources present different perspectives on the past. Students develop skills of note-taking, analytical reading, writing, and research. In addition, United States History Survey Honors students read more primary and secondary sources and make more presentations.

Contemporary Issues College Prep (one or two semester course offered both semesters; also a CATS Innovation course) The content will be different both semesters, so students may take it for one semester or two semesters.

Prerequisite: one year of U.S. History Survey CP or Honors



This course provides an introduction to the issues that dominate the news through the year. The focus is on current events and related debates in the United States and around the world. By studying social, political, and economic issues, students gain insight into their own place in history and the relevance of today's events to historical themes. In addition to raising students' awareness of world history, the course develops their skills of analysis, reading, writing, and speaking.

World History II: Global Conflicts (year-long course; semesters may be taken separately; offer both CP and Honors)

Prerequisites for CP: ESL Level 3 or higher; US History ESL, CP, or Honors

Prerequisites for Honors: ESL Level 4 or higher; US History ESL, CP, or Honors

Events throughout the history of humanity have shown us that there lies a dark side to human nature. This course examines specific case studies of events in Latin America, Asia, Africa, and Europe during the 20th Century. An examination of social and political history and geography provides students with a comprehensive understanding of the events that occurred in the regions of Latin America, Asia, Africa, and Europe. Students view events through a multicultural lens in an attempt to understand the unfolding of events through a multiplicity of cultural identities involved in those events. The skills of interpreting charts, primary sources, political cartoons, and other historical documents are also developed.

World History II Honors covers the same topics as the CP course but requires more academically rigorous assignments and readings.

Introduction to Law, Honors (one semester course offered both semesters)

Prerequisites: ESL Level 3 or higher; US History

The legal profession is practiced worldwide, and attorneys are valued for their ability to analyze and solve complex problems. This course is designed to provide students with the opportunity to learn and practice problem solving skills and legal analysis. Students utilize case studies, mock trial, projects, and activities to gain an understanding of the legal process, how attorneys analyze and litigate cases as well as how courts determine outcomes. Students practice what they learn by working with a team to prepare and present a legal case in a mock trial. In this course, students sharpen their critical thinking and oral presentation skills as well as gain an understanding about what it is like to practice law or work with lawyers in a corporate setting or law firm.

Introduction to Philosophy College Prep (one semester course offered both semesters)

Prerequisite: ESL Level 3 or higher; one year of U.S. History Survey CP or Honors

This course is a survey of Philosophy that challenges students to see how philosophy has been used in history as a way for humans to understand themselves and the nature of reality. It looks at both Eastern and Western philosophical traditions. Students also have the opportunity to examine their own philosophy and goals. This is a course that develops students' powers of analysis, reading, writing, and speaking.

Macroeconomics College Prep (one semester course; also a CATS Innovation course)

Prerequisite: ESL Level 3 or higher; grades 11 and 12

This one-semester Social Science elective (fall only) is paired with one semester of Microeconomics CP to make a one-year college prep course in Economics. These courses are part of the CATS Innovation Program and prepare students to succeed in college-level or AP Economics. In Macroeconomics CP, students learn how economic decisions are made at the national



and international level. They examine economic systems around the world and economic policy-making in the United States. Students learn about markets, industries, trade, banking, finance, economic indicators, economic policy, and the Federal Reserve. Students also learn about the new economy, management, and entrepreneurship.

AP Macroeconomics (year-long course offered in alternate years with AP Microeconomics)

Prerequisites: ESL Level 4 (ESL Level 5 preferred); B or higher in American History Survey Honors or A- or higher in American History Survey CP; recommendation of instructor and department chair; completion of Pre-Calculus and Algebra II with grades of B or higher.

AP Macroeconomics is a one-year Social Science elective that prepares students for the AP Macroeconomics exam. It is a college-level introductory course with potential for college credit. AP Macroeconomics focuses on national economic issues and policy. Topics include national income, inflation, unemployment, the economic cycle, economic growth, fiscal and monetary policy, the financial sector, and international trade. The textbook is by Paul Krugman, supplemented by articles from *The Economist*, *The New York Times*, and other sources.

Microeconomics College Prep (one semester course; also a CATS Innovation course)

Prerequisite: ESL Level 3 or higher; grades 11 and 12

This one-semester Social Science elective (spring only) is paired with one semester of Macroeconomics CP to make a one-year college prep course in Economics. These courses are part of the CATS Innovation Program and prepare students to succeed in college-level or AP Economics. Microeconomics CP focuses on industries and companies at the local and regional level. Students learn about start-ups and Boston's high-tech and R-and-D (research and development) fields. Each student presents a term project about a company from these or traditional New England industries like defense, paper and logging, fishing, food processing, farming, retail sales, wholesale distribution, transportation, tourism, education, and telecommunications. Students may also choose a company from the financial sector: banking, real estate, venture capital, investment banking, consulting, insurance, securities, and mutual funds. As part of Microeconomics CP, students visit companies and meet professionals from business and government.

AP Microeconomics (year-long course offered in alternate years with AP Macroeconomics; will be offered in 2020-2021)

Prerequisites: ESL Level 4 (ESL Level 5 preferred); B or higher in US History Honors or A- or higher in US History CP; recommendation of instructor and department chair; completion of Pre-Calculus and Algebra II with grades of B or higher.

AP Microeconomics is a one-year Social Science elective that prepares students for the AP Microeconomics exam. It is a college-level introductory course with potential for college credit.

AP Microeconomics focuses on supply and demand, elasticity, markets, and the economic gains or losses of households, firms, and industries. The textbook is by Paul Krugman, supplemented by articles from *The Economist*, *The New York Times*, and other sources.

AP United States History

Prerequisites: ESL Level 4 (ESL Level 5 preferred); B or higher in US History Survey Honors or A- or higher in US History Survey CP; and recommendation of instructor and department chair



This is a one-year Social Science elective that prepares students for the AP United States History exam. Students have usually had at least one year of American history before taking this course. AP United States History is a college-level course with potential for college credit. AP United States History helps prepare students for social science courses in college. Students examine historical documents and argue about social, political, and economic history from 1600 to the present. In order to manage the large number of facts, students must have a good grounding in the themes of American history. This class helps students understand evidence, relevance, cause and effect, and points of view. After the AP exam, students present an American history research project on a topic of their choice.

AP Human Geography

Prerequisite: ESL 4 or higher; B or better in US History Survey Honors or A- or better in US History Survey CP

AP Human Geography course is an introductory college-level course in Human Geography. As history is a study of time and events, human geography is a study of place and events. Students in this course focus on economic development and introduction to social science. The course includes topics like the environment, health care, religion, and education around the world and in history. Knowledge of geographers' methods and tools is also part of the course. AP Human Geography emphasizes acquisition of college-level vocabulary and concepts. Students are required to take the AP Human Geography exam.

AP World History

Prerequisites: ESL Level 4 (ESL Level 5 preferred); B or higher in American History Survey Honors or A- or higher in American History College Prep; and recommendation of instructor and department chair.

This is a one-year Social Science elective that prepares students for the AP World History exam. Students study ancient civilizations, world religions, the Renaissance, the Industrial Revolution, global imperialism, and world conflicts. AP World History is a college-level course with potential for college credit. AP World History helps prepare students for social science courses in college. Students are assessed through rigorous quizzes and tests, oral presentations, and midterm and final examinations. In addition, students write a ten-page research paper and present their findings in a public setting. The course requires seven hours of homework per week and is open to juniors and seniors.

Women in World History: (one semester course; Fall 2019)

Pre-requisites: ESL: Level 3 or higher

This course explores the role of women from the Modern Age through the end of the 20th century on six continents. It uses a thematic approach that surrounds the roles of gender and identity in case studies that tie into historical events. Background is be given on the event, and the role that women played to shape the event, sometimes in the primary position and sometimes in supporting roles. Topics include slavery, race, and gender in Africa and the Americas, the role of gender in the enlightenment and revolution, Muslim female teachers and writers, women's roles in the Cold War in Eastern Europe, and women in the digital age in Asia.

**Women in American History (one semester course; Spring 2020) Prerequisites:** ESL Level 3 or higher

This course explores the role of women from the 1600's through the end of the twentieth century with the goal of understanding not just what women have done but also how many fundamental moments and issues in US history – including the formation of the early republic, reform movements, slavery, war, and race relations – have hinged on certain notions of gender. Studying women's history also means being aware of the way women have been divided by class, race, ethnicity, and more, and that while the voices of white, elite women tend to predominate, the experiences of less privileged women and women of color have also had significant effects on shaping the American past.

Technology**AP Computer Science A**

Prerequisites: ESL Level 4 and completion of Algebra II or instructor approval

The Advanced Placement Computer Science A course is taught using the Java programming language. The course objectives are to understand object-oriented software design, to gain fluency in Java, to improve proficiency in selecting appropriate algorithms and data structures, to understand algorithm efficiency especially with regard to sorting, and perhaps most importantly to prepare for the AP Computer Science A exam. There are a variety of exercises, labs, and case studies in this course. The course textbook is *Java Methods*.

Coding for Visual and Interactive Media (one semester-Fall 2019; CATS Innovation course)

Pre-requisites: Completed or concurrently enrolled in Algebra 2; ESL 3 or above.

This course blends art and coding by giving students the skills and tools to easily write computer code with visual outcomes. Based on the Processing coding language (simplified Java), students learn the fundamentals of computer programming in a visual context. Students who are new to programming will find the experience intensely satisfying to make something appear on their screen within moments of writing introductory lines of code. The Processing language is used widely in educational settings as well as in interactive museum exhibitions and professional art shows. The textbook is *Processing: A Programming Handbook for Visual Designers and Artists*, 2nd edition, by Reas and Fry.

Computer-Aided Design (CAD) (one semester course; also an Arts and CATS Innovation course)

In this course students learn introductory CAD skills to aid them in the drafting, designing, and engineering process. They learn basic concepts, processes, and skills required of architectural and industrial design professionals. Students design virtual objects and print them on a 3D printer. They begin by designing a piece of furniture. Students are introduced to set design for theatre, and by the end of the class, students have all of the skills necessary to digitally design their "dream house."

Graphic Design (one semester course offered both semesters; also a CATS Innovation course)

The purpose of this course is to introduce students to elements of graphic design. Students utilize computer programs from the Adobe Creative Cloud such as Photoshop and Illustrator. Class projects include poster design, photo



manipulation, logo design, and creating a business identity. Students learn valuable skills in color, composition, and typography and the importance these have on creating eye-catching design.

Introduction to Programming (also a CATS Innovation course)

Prerequisites: Completed Algebra 1. ESL 3 or above

Introduction to Programming is an exciting course where students learn important concepts related to Computer Science. Students learn with hands-on projects how to go from creating simple programs in Python such as creating a wind chill calculator to more complicated programs including creating a chatbot or a graphics program for playing a game such as scrabble. Important topics include Object Oriented Programming, Standard Algorithms, and Data Structures such as arrays, lists, tuples, Iteration, Recursion, String manipulation, and creating GUIs (Graphical User Interfaces).

Open Source Engineering (one semester course; also a CATS Innovation course)

Prerequisites: ESL Level 3; completed or currently enrolled in Algebra 2. One of the following: completed Robotics; currently enrolled in Physics; or permission from instructor.

This course introduces students to the world of open source engineering, develops their love of technology and design, as well as improves their problem-solving skills. The lessons and activities are centered on Arduino, an internationally popular open-source software and hardware ecosystem. The course starts with case studies of engineering solutions to real-world problems and then moves on to more complex projects such as monitoring and controlling devices using software, sensors, and actuators. All students work in small groups, maintain engineering notebooks, generate CAD drawings, and write Arduino code. Extension projects include fabricating parts on the school's 3D printer, programming machines using Python, and participating in off-campus design competitions.

Robotics (one semester course; also a CATS Innovation course)

Prerequisites: ESL Level 2 or higher; instructor approval

This class introduces students to the exciting world of robots. Students learn to identify what a robot is and what it isn't. They study the myths that surround robots, examine how robots are used in popular media and stories, and consider applications of robotics in many aspects of technology and human experience. Through hands-on design and construction work, students explore how robots are constructed, how they operate, and what their limitations are. The class greatly benefits from lectures by experts in the field of robotics to expose students to the commercial uses of robots as well as future trends. There are field trips to local robotics companies as well as to robotics events and competitions. Students focus on the origins, applications, and latest trends in robotics and learn how robots are built and controlled. There are individual as well as team-based projects for students to test their ideas and compete with each other as well as with outside teams.

Software Engineering

Prerequisites: Completed Algebra I; ESL 3 or higher; or at the discretion of the teacher based on student's prior programming knowledge

The Software Engineering course is designed to let students experience the software development lifecycle. The objective of the course is to give students a real world use for the skills they have obtained through programming. Java will be the



main programming language that will be used, but others will be discussed, such as Javascript and C. In this course students learn how to design specifications, implement ideas, and finally release a finished software product. The course also covers Quality Assurance Testing, Fundamentals of Computing, Ethics, and Algorithms. Students complete a project comparing Greedy Algorithms to Dynamic Programming, which are both used for sorting and searching data.

Test Prep

SAT Prep

This course is recommended for all 11th graders who have not scored a combined 1250 or above on the SAT.

This class is designed to improve student performance on the SAT. Students practice the core skills to be tested on the SAT: reading comprehension, writing and grammar, and mathematics both with and without a calculator. The class also provides students with SAT-specific practice, including official SAT practice tests, allowing them to become more comfortable answering SAT-style questions and utilizing strategies that best fit the SAT. This course is recommended for all 11th graders who have not scored a combined 1250 or above on the SAT.

TOEFL Prep

This course is required in the fall for all non-native English speakers who are in ESL Level 3 or 4 as juniors or new seniors.

This class is designed to work in conjunction with ESL to best prepare students to take the TOEFL iBT test and generally improve their English proficiency. Students practice general core skills such as reading comprehension and grammar, as well as TOEFL-specific instruction to improve performance on the TOEFL reading, writing, listening, and speaking tests.

World Languages

French Level I

Prerequisite: ESL Level 3; instructor approval

French I is a year-long general introduction to the French language for beginning students and follows the rigor as well as the scope and sequence of a regular ACTFL-based high school language course. Students communicate across the four skills of reading, writing, speaking, and listening using basic French vocabulary and simple grammatical structures within the cultural norms of French-speaking societies. Some vocabulary themes are numbers, school, shopping, food, family, and the home. The major grammatical concepts are present tense verbs and gender. Activities and assignments utilize interpersonal, presentational, and interpretive modes of communication. Assessments include, but are not limited to, class participation, homework, comprehensive unit tests, short compositions, a variety of projects, and final exams. Students are frequently given assignments to be completed outside of class, as well as nightly homework. By the end of French I, students achieve a proficiency level of Novice High in all four communicative skills (reading, writing, speaking, listening) as described by the American Council of Teachers of Foreign Languages (ACTFL).



French Level II

Prerequisites: ESL Level 3; successful completion of French I or instructor approval

French II, a year-long course, is a continuation of French I. Students communicate across the four skills of reading, writing, speaking, and listening in the interpersonal, interpretive, and presentational communicative modes within the cultural context of French-speaking societies. This course is based on the American Council of Teachers of Foreign Language (ACTFL) standards and requires nightly homework and assignments to be completed outside of class. Topics to be studied include vocabulary related to health, hobbies, and travel and the past tenses. Assessments include class participation, homework, projects, compositions, and final exams. By the end of French II, students are expected to demonstrate a low-intermediate level of proficiency in all four skills as characterized by the ACTFL.

French Level III

Prerequisites: ESL Level 3; successful completion of French II or instructor approval

French III, a year-long course, is a continuation of French II. Students communicate across the four skills of reading, writing, speaking, and listening in the interpersonal, interpretive, and presentational communicative modes within the cultural contexts of France and the other Francophone countries. This course is based on the ACTFL standards and requires nightly homework and assignments to be completed outside of class. Topics studied include vocabulary related to health, technology, art and culture, and the environment, as well as the imperative and subjunctive modes. Assessments include class participation, homework, projects, compositions, and final exams. By the end of French III, students are expected to demonstrate an ACTFL Mid-Intermediate level of proficiency in all four skills.

French Level IV

Prerequisites: ESL Level 3; successful completion of French III or instructor approval

French IV, a year-long course, is a continuation of French III. Students communicate across the four skills of reading, writing, speaking, and listening in the interpersonal, interpretive, and presentational communicative modes within the cultural contexts of France and the other Francophone countries. This course is based on the ACTFL standards and requires nightly homework and assignments to be completed outside of class. Topics studied include vocabulary related to relationships, social issues, politics, government, history, and work, as well as the past subjunctive and conditional modes. This course also explores authentic literature, film, and the histories of French-speaking countries. Assessments include class participation, homework, projects, compositions, and final exams. By the end of French IV, students achieve an ACTFL Intermediate-High level of proficiency in all four skills.

AP French Language and Culture

Prerequisites: ESL Level 3; evidence of strong work habits, solid study skills, and self-motivation; high school French Level IV or a minimum of 3 years of study at a previous school or evidence of skills and knowledge as demonstrated on a CATS placement test; instructor approval

AP French Language and Culture is a college-level course intended for students in their fourth year of study of French. The three modes of communication (Interpersonal, Interpretive and Presentational) defined in the Standards for Foreign Language Learning in the 21st Century are foundational to the AP French Language and Culture course. Course work provides students with opportunities to demonstrate their proficiency in each of the three modes in the intermediate to pre-advanced range as described in the ACTFL Performance Guidelines for K–12 Learners. Students who enroll in this



course should already have a good command of the grammar and considerable competence in listening, reading, speaking and writing. When communicating, students in the AP French Language and Culture course demonstrate an understanding of the culture(s), incorporate interdisciplinary topics (connections), make comparisons between the native language and the target language and between cultures (comparisons), and use the target language in real-life settings (communities). Exclusive use of French by teacher and students for active communication is de rigueur in the classroom. Because this course is designed as a test preparation course, we follow the AP curriculum guide: students communicate about global challenges, beauty and aesthetics, science and technology, contemporary life, personal and public identities, and families and communities. These topics, as well as literature, film, and French and Francophone history and culture, are the contexts for analysis, comparison, conversation, translation, interpretation, and much of the vocabulary that students study during this course. Students use several primary textbooks and other authentic materials and resources that are in accordance with those suggested on the College Board website. Students are expected to take the AP French Language and Culture exam at the end of this course. Although CATS AP French students are expected to take the French AP test, students are also encouraged to take the SAT French Subject Test if they so choose. Assessments include exams, tests, compositions, presentations, and projects.

Spanish Level I

Prerequisite: ESL Level 3; instructor approval

Spanish I is a year-long general introduction to the Spanish language for beginning students and follows the rigor as well as the scope and sequence of a regular ACTFL-based high school language course. Students communicate across the four skills of reading, writing, speaking, and listening using basic Spanish vocabulary and simple grammatical structures within the cultural norms of Spanish or Latin American society. Some vocabulary themes are numbers, school, shopping, food, family, and the home. The major grammatical concepts are present tense verbs and gender. Activities and assignments utilize interpersonal, presentational, and interpretive modes of communication. Assessments include, but are not limited to, class participation, homework, comprehensive unit tests, short compositions, a variety of projects, and final exams. Students are frequently given assignments to be completed outside of class, as well as nightly homework. By the end of Spanish I, students should have achieved a proficiency level of High Beginning.

Spanish Level II

Prerequisites: ESL Level 3; successful completion of Spanish I or instructor approval

Spanish II, a year-long course, is a continuation of Spanish I. Students communicate across the four skills of reading, writing, speaking, and listening in the interpersonal, interpretive, and presentational communicative modes within the cultural context of Latin America or Spain. This course is based on the ACTFL standards and requires nightly homework and assignments to be completed outside of class. Topics to be studied include vocabulary related to health, hobbies, and travel and the past tenses. Assessments include class participation, homework, projects, compositions, and final exams. By the end of Spanish II, students are expected to demonstrate a Low-Intermediate level of proficiency in all four skills as characterized by the American Council of Foreign Language.

Spanish Level III

Prerequisites: ESL Level 3; Spanish II or instructor approval

Spanish III is designed for students who have successfully completed Spanish II or who can demonstrate that they have achieved the Intermediate-Low level of proficiency in all four skills (reading, writing, speaking, listening) according to the



American Council on the Teaching of Foreign Languages (ACTFL). Students communicate about topics that are meaningful to them such as friendship, relationships, life goals, jobs, finances, politics, social issues, and entertainment, as well as popular culture and the fine arts. These topics, as well as Latin American and Spanish history and culture, are the contexts for analysis, comparison, conversation, interpretation, and much of the vocabulary at this level. Students use a textbook and online video to participate in listening and practice activities. They begin to read literary fragments and watch and listen to native speakers from recordings and films. Students also research and present about the arts and social issues. Any major gaps in knowledge of thematic vocabulary and grammar study are addressed. Students are assessed through exams, tests, projects, compositions, homework, and skits.

Spanish Level IV

Prerequisites: ESL Level 3; Spanish III or instructor approval

Spanish IV is designed for students who have successfully completed Spanish III or can demonstrate that they have achieved the Mid-Intermediate level of proficiency in all four skills (reading, writing, speaking, listening) according to the American Council on the Teaching of Foreign Languages (ACTFL). Students improve their communication skills through the study of the cultures of Latin America and Spain. They read and analyse literature and films, as well as explore the histories of the Spanish-speaking countries beginning with the re-conquest of Spain from the Moors and the Spanish conquest of the Americas. Vocabulary is generated from the literature and films – both consisting of authentic resources - and the history textbook, while grammar study is generated according to and depending on student work. Students are assessed through exams, tests, projects, compositions, homework, and participation.

AP Spanish Literature and Culture

Prerequisites: ESL Level 3; evidence of strong work habits; solid study skills and self-motivation; high school Spanish IV or a minimum of 3 years study at a previous school or evidence of skills and knowledge as demonstrated on a CATS placement test; instructor approval

The AP Spanish Literature and Culture course is designed to provide students with a learning experience equivalent to that of an introductory college course in literature written in Spanish. The course introduces students to the formal study of a representative body of texts from Peninsular Spanish, Latin American, and U.S. Hispanic literature. The course provides opportunities for students to demonstrate their proficiency in Spanish across the three modes of communication (interpersonal, interpretive, and presentational) and the five goal areas (communication, cultures, connections, comparisons, and communities) outlined in the Standards for Foreign Language Learning in the 21st Century. The overarching aims of the course are to provide students with ongoing and varied opportunities to further develop their proficiencies across the full range of language skills — with special attention to critical reading and analytical writing — and to encourage them to reflect on the many voices and cultures included in a rich and diverse body of literature written in Spanish. The inclusion of “and Culture” in the title of the course reflects a purposeful alignment of the course to a standards-based Spanish curriculum. In particular, the course reflects a meaningful integration of the cultures, connections, and comparisons goal areas of the Standards. Emphasis is placed on approaching the study of literature through global, historical and contemporary cultural contexts. A key objective of the course is to encourage students not only to understand and retell the content of the texts they read but also to relate that content to literary, historical, socio-cultural, and geopolitical contexts in Spanish. CATS AP Spanish Literature students are expected to take the Spanish AP Literature and Culture test. Assessments include exams, tests, compositions, presentations, and projects.



AP Spanish Language and Culture

Prerequisites: ESL Level 3; evidence of strong work habits; solid study skills and self-motivation; high school Spanish IV or a minimum of 3 years study at a previous school or evidence of skills and knowledge as demonstrated on a CATS placement test; instructor approval

AP Spanish Language and Culture is designed for students who have successfully completed Spanish IV or who can demonstrate that they have achieved the Intermediate-High level of proficiency in all four skills (reading, writing, speaking, and listening) according to the American Council on the Teaching of Foreign Languages (ACTFL). The focus of this course is communication using these four skills within the cultural norms of the Spanish-speaking world. The AP Spanish Language and Culture course is approximately equivalent to an upper-intermediate college or university Spanish course. The AP Spanish Language and Culture course strives to promote both fluency and accuracy in language use and not to overemphasize grammatical accuracy at the expense of communication. However, students are expected to enter the course with a solid grasp of grammar, as well as an extensive vocabulary, enabling them to communicate at higher abstract levels. Major gaps in knowledge of thematic vocabulary and grammar study are addressed. Because this course is designed as a test preparation course, we follow the AP curriculum guide: students communicate about global challenges, beauty and aesthetics, science and technology, contemporary life, personal and public identities, and families and communities. These topics, as well as literature, film, and Latin American and Spanish history and culture in both contemporary and historical contexts, are the contexts for analysis, comparison, conversation, translation, interpretation, and much of the vocabulary that students study during this course. The three modes of communication (Interpersonal, Interpretive, and Presentational) defined in the *Standards for Foreign Language Learning in the 21st Century* are foundational to the AP Spanish Language and Culture course. Assessments include exams, tests, compositions, presentations, and projects. CATS AP Spanish students are expected to take the Spanish AP examination. Students who are successful in this course and exam may continue their study of college-level Spanish by also taking the AP Spanish Literature and Culture course and exam.

CATS Academy Boston is pleased to offer Mandarin Chinese online.

Online courses provide an innovative learning environment designed to give high school students the opportunity to develop the knowledge and skills needed to utilize technology to learn, communicate, access information, collaborate, and compete for advancement. Courses are taught by highly qualified instructors.

Course availability is subject to providers with whom we contract so while a course may be offered in the 2019-2020 school year, students should take note that continued course sequence (e.g., Chinese 2) may not be offered as one needs in subsequent years. If you are interested in taking an online course in Mandarin Chinese, please see Ms. Cruz-Fernandez.



CATS Innovation

An integral part of the curriculum is CATS Innovation, a STEAM program (Science, Technology, Engineering, Arts, and Mathematics) that prepares students to creatively find connections between areas of study. Electives in the program provide students with hands-on experience in technology, social justice, and environmental responsibility. Through CATS Innovation, students explore interdisciplinary areas of interest that give them insights into potential areas of study in college. These courses enhance students' college readiness by developing their communication, teamwork, leadership, and decision-making skills.

Students interested in completing the CATS Innovation Certificate must complete five CATS Innovation courses including Professional Communication* and earn a 3.0 average for those courses. Additionally, they should contact the Director of CATS Innovation for registration in the program.

CREATIVE ARTS

VISUAL ARTS

Digital Photography and Video Production (one semester course; also a Visual Arts course)

Introduction to Fashion Design (year-long course; also a Visual Arts Course)

Costume Design and Construction (one semester course offered both semesters; also a Visual Arts course)

Advanced Fashion: Sustainability (one semester course offered Fall 2019)

Advanced Fashion Technology and Marketing (one semester course offered Spring 2020; also a Fashion/Art course)

Prerequisites: Previous fashion class or permission of instructor

Computer Aided Design (CAD) (one semester course offered both semesters; also a Visual Arts course)

Creating Comics 1: introductory Level (one semester course offered both semesters; also a Visual Arts course)

Creating Comics 2: Advanced Level (one semester course, Spring 2020) also a Visual Arts course)

Graphic Design (one semester course offered both semesters; also a Visual Arts course)

Theatre

Theatre Production (year-long course; also a Theatre course)



MUSIC

Business of Music (one semester course; also a Music course)

Prerequisite: ESL Level 3 or higher

Music Technology and Production (year-long course; also a Music course)

Prerequisite: ESL Level 3 or higher

LITERATURE

Social Justice Literature – A Look at Critical Issues and Current Events through a Discussion of Young Adult Novels (one or two semester course offered both semesters; also an English Literature Course)

Prerequisite: ESL 4

MATHEMATICS

Game Theory (one semester course; also a Mathematics course)

Prerequisites: ESL Level 3 or higher; Algebra I; instructor approval

Applications of Game Theory: Traditional Game Design (also a Mathematics course)

Prerequisites: Game Theory or instructor approval

History of Mathematics (year-long course; also a Mathematics course)

Prerequisites: Completed Algebra II; ESL Level 4 or higher

SCIENCE

Astronomy: The Solar System (one semester course offered both semesters; also a Science course)

Pre-requisites: Completed or concurrently enrolled in Algebra 1; ESL Level 3 or higher.

Biomechanics (one semester course; also a Science course)

Prerequisites: General Science and ESL Level 3 or higher

Environmental Science College Prep (year-long course; also a Science course)

Prerequisites: Returning students: Recommendation of previous instructor. New students: placement test

Environmental Science Honors (year-long course; also a Science course)

Prerequisites: Returning Students: Recommendation of previous instructor. New Students: Placement test. All Students: ESL Level 3 or Higher; Minimum 2 of 3 of the following science courses: Biology, Chemistry and/or Physics.



Genetics (one semester course; also a Science course)

Prerequisites: ESL level 3 or higher. Returning students: Recommendation of previous instructor. New students: Placement test.

Entomology: The Study of Bugs (one semester course offered both semesters; also a Science course)

Prerequisites: ESL Level 2 or higher

Food and Medicine: An Organic Chemistry Approach (one semester course; also a Science course)

Prerequisites: ESL Level 3; Previous Chemistry course

SOCIAL SCIENCE

Contemporary Issues College Prep (one or two semester course offered both semesters; also a Social Science course). The content will be different both semesters, so students may take it for one semester or two semesters.

Prerequisite: one year of U.S. History CP or Honors

Macroeconomics CP (one semester course; also a Social Science course)

Prerequisites: ESL Level 3 or higher; grades 11 or 12

Microeconomics College Prep (one semester course; also a Social Science course)

Prerequisites: ESL Level 3 or higher; grades 11 or 12

TECHNOLOGY

Coding for Visual and interactive Media (one semester course, Fall 2019)

Computer-Aided Design (CAD) (one semester course; also a Visual Arts course)

Graphic Design (one semester course offered both semesters; also a Visual Arts course)

Introduction to Programming

Prerequisites: Completed Algebra I; ESL Level 3 or higher

Open Source Engineering (one semester course)

Prerequisites: ESL Level 3 or higher; completed or currently enrolled in Algebra II. One of the following: completed Robotics; currently enrolled in Physics; or permission from instructor.

Robotics (one semester course)

Prerequisites: ESL Level 2 or higher; instructor approval



Additional CATS Innovation Elective

Professional Communications (one semester course)* - *REQUIRED FOR CATS INNOVATION CERTIFICATE OF EXCELLENCE*

Prerequisite: ESL Level 3 or higher

This course helps students develop confidence, poise, and presentation skills. Students learn strategies and techniques for making successful presentations and have opportunities to practice role playing and presenting to peers and to school audiences of all sizes. Students learn how to analyze reports and other sources of information to select the most salient points, and they learn ways to present the information, both visually and verbally, for the most effective impact. Students learn how to connect with the audience, even if they need to use notes, and how to engage the audience with their work or topic. The course focuses on helping students find their own style of communication for presentations. In addition, the course teaches cross-cultural communication techniques so that students can effectively communicate with peers from multiple countries while bridging any communication gaps across cultures. A goal of the course is for students to have fun while building up these critical skills that will serve them beyond their time at CATS, in college, and as members of the global community and workplace.