

Eleventh Grade Academic Program (2023-24)

Required Courses

English

All students are required to take one English course each semester, for a total of four years of English. Teacher recommendation and administrative approval are required for AP courses.

Foundations and Development of Literature – 11th grade

In this course, 11th grade students trace the roots of American Literature from the 16th century to the present. A major project involves them in putting a noteworthy but somewhat controversial literary work “on trial.” Public performances by the winning teams are viewed by the entire school and invited guests. Academic research is extended to secondary sources. Students also read and write about news articles on current events that connect to curriculum as well as poetry that connects to texts. Vocabulary is culled from works studied and incorporated into writing. Supplementary poetry, short fiction and non-fiction essays are also addressed. In this year, students are encouraged both to explore special interests in reading and writing and to address any deficits in their English language skills. An accelerated section will highlight rhetorical strategies and stylistic techniques that authors use in order to create their messages. Students who choose to do so will be prepared to take the AP English Language and Composition exam in May. A skills section will also be available to those students who will benefit from assistance with writing tasks and reading comprehension. Placement will be based on department approval with input from administration.

History

All juniors are required to take U.S. History. Teacher recommendation and administrative approval are required for the AP course. You may take an additional course as an elective.

Advanced Placement United States History

A course in United States History is required for all juniors. Students may take Advanced Placement United States History. The Advanced Placement Program is designed to allow high school students the opportunity to pursue college-level studies while attending high school. While the course covers the same periods of history as the regular U.S. history course, emphasis will be placed on reading original sources and analyzing differing interpretations of historical events.

United States History

All eleventh grade students who do not take AP U.S. History are required to take this course. It covers the political, economic, and social conditions in the United States from the beginning of our history to present times. The Constitution and the historical setting in which it was written will be studied. Students will understand the great historical developments that led to the U.S. becoming the democratic super-power of the world today. They will read textbooks, original sources, and current affairs articles in order to learn how to draw conclusions and become informed citizens and voters. Based on teacher and administrative input, students may be placed in sections that are specialized in order to address their needs for enrichment and/or remediation.

Mathematics

Students are required to take one math course in their junior year. Placements are determined by the mathematics department.

Math 11

This course is designed for juniors who have successfully completed Algebra and Math 10 (Geometry). Students enhance their algebraic skills and develop an understanding and mastery of a variety of topics in Algebra, Trigonometry and Pre-Calculus. Topics include polynomials, set theory, trigonometry, matrices and linear algebra, functions, conic sections and game theory. Students are encouraged to develop skills and work habits that will last throughout their academic and future careers.

Algebra II with Trigonometry

This course is given to eleventh grade students who have completed geometry. Students enhance their algebraic skills and develop an understanding and mastery of trigonometric concepts. Students extend their study of real numbers, equations and inequalities, functions, systems of equations, polynomials, rational expressions, complex numbers, quadratic equations, transformations, second degree equations, polynomial functions, exponential and logarithmic functions, an in depth study of trigonometric functions, graphs, identities, and equations, probability, and statistics. Teacher recommendation and administrative approval are required.

Pre-Calculus AB

This course is given to eleventh grade students who have completed Algebra II with Trigonometry. Students further develop the algebraic and trigonometric skills that are necessary for success in AP Calculus AB. Students study linear and quadratic functions, polynomial functions, inequalities, functions, exponents and logarithms, analytic geometry and conic sections, trigonometric functions, trigonometric equations, triangle trigonometry, trigonometric addition formulas, and introduction to limits.

Pre-Calculus BC

This course is given to eleventh grade students who have completed Algebra II with Trigonometry. Students further develop the algebraic and trigonometric skills that are necessary for success in AP Calculus BC. Students study linear and quadratic functions, polynomial functions, inequalities, functions, exponents and logarithms, analytic geometry and conic sections, trigonometric functions, trigonometric equations, triangle trigonometry, trigonometric addition formulas, polar coordinates and complex numbers, vectors and determinants, sequences and series, matrices, limits, continuity, techniques of differentiation, and related rates. Teacher recommendation and administrative approval are required.

Science

Students are required to take one science course in the junior year. Physics as a third year of science is strongly recommended. Placement is determined by the department in consultation with the administration. Teacher recommendation and administrative approval are required for enrollment in an AP course.

Foundational Physics

Foundational Physics considers topics related to energy and matter, and the principles that govern the motion of particles and waves. Mathematics is introduced as a "language" for describing physical phenomena and students are encouraged to solve problems using mathematics throughout the course. For students who struggle with math, this course shows them real world applications without the complexity of multi-step equations. The laboratory is used to teach the concepts of physics and make connections to basic math. In this way, students will experience physics in a way that is meaningful and directly applicable to their lives. The topics covered in this course include mechanics, work-energy theory, spring systems, optics, electricity and magnetism.

Physics

Introductory Physics considers topics related to energy and matter, the principles that govern motion of particles and waves, and the interaction of particles. The use of mathematics as a "language" for describing physical phenomena and solving problems is emphasized throughout the course. For this reason, we delay enrollment into the course until eleventh grade when students have achieved a high level of skills in mathematics (algebra and trigonometry). The laboratory is used to derive and illustrate major concepts of physics. Students need to become skilled at performing laboratories and at analyzing data and formulating broad principles that account for the physical phenomena being studied. Students will be taught how to use spreadsheets to organize and graph data and to use sensors to record data electronically. The major topics covered in this course include mechanics, work energy theory, spring systems, wave phenomena and electricity and magnetism.

AP Physics I

AP Physics I is an algebra-based, introductory college-level physics course. The course focuses on Newtonian mechanics and dynamics; Circular motion and Gravitation; Work, Power and Energy; Linear Momentum, Simple Harmonic Motion; and Torque and Rotational motion. Students cultivate their understanding of physics through classroom study, demonstrations, in-class activity, and hands-on, inquiry-based laboratory work as they explore concepts like systems, fields, force interactions, change, conservation, and waves. AP Physics 1 students will keep and are encouraged to retain their physics laboratory notebooks, reports, and other materials as colleges may require students to present their laboratory materials from the course before granting college credit for laboratory.

AP Biology

AP Biology is offered as an introductory college-level biology course spanning the breadth of the life sciences offered to highly motivated students of strong academic quality. The curriculum which has undergone recent redesigning and College Board approval now stresses critical thinking and application of biological concepts in the context of 4 'big ideas.' The thematic approach makes study areas more meaningful as students make connections across the syllabus. Ultimately, students will develop a conceptual understanding of modern biology emphasizing applications of biological knowledge, scientific methodology, techniques, and critical thinking. These tools will help students understand themselves and the living world around them and better prepare them for the scientific, environmental, and social changes that will be a prominent part of their future. It

is important to note that the conceptual framework of this course is based on the current ideals of evolution as the underlying foundation for all biological principles. AP Biology includes rewritten crucial laboratory exercises suggested by the College Board as well as several other labs deemed both important and helpful. After-school laboratory and classroom sessions are often scheduled to meet course requirements. In addition to work using the assigned textbook, students are required to study and master many forms of text supplementation, including on-line sources and current scientific literature. All students are expected to take the AP Biology Exam. Teacher recommendation and administrative approval are required for enrollment.

AP Chemistry

AP Chemistry is designed to offer a rigorous and challenging course that covers the chemical principles typical of college and university general chemistry courses and is offered to highly motivated students of strong academic quality. AP Chemistry students will be expected to reinforce classroom-taught principles through consistent regular review, practice assignments and on-line activities. All are expected to take the AP Chemistry Exam and maintain a laboratory notebook. The topic areas covered in this course are atomic structure and properties, molecular and ionic bonding, intermolecular forces, reactions and stoichiometry, kinetics and equilibria, solution chemistry, acid-base theories and redox and electrochemistry. These topics have been reworked to emphasize the major themes and concepts of advanced chemistry in compliance with the redesign mandated by the College Board. There are several required laboratories, several of which are inquiry-based, and students must submit detailed, college-level reports for each. After-school laboratory and classroom sessions are often a required part of the course. Teacher recommendation and administrative approval are required for enrollment.

Environmental Science

Environmental Science is an elective science course intended to cover the principles and methodologies used to study the interrelationships between organisms and their physical surroundings and the impact of humans on the natural world. This course is necessarily interdisciplinary and depends on the successful integration of science with political, sociological, and economic issues. The underlying themes developed in the course are: energy conversions are involved in all ecological processes, matter must be recycled in ecological systems, ecological systems are all interconnected, humans alter ecological systems,

ecological problems occur in a political, cultural, and economic context, and human survival depends on developing practices that allow for sustainable ecosystems. This course includes a laboratory component that allows students to apply and reinforce course concepts as well as an engaging field component centering upon environmental monitoring. Field trips to local nature centers and municipal utilities are also integral to the curriculum. Teacher recommendation and administrative approval are required for enrollment.

Electives

History/Social Science

Teacher recommendation and administrative approval are required.

Law/Jewish Perspectives on Constitutional Law

This foundational course will explore the structure of the American legal system. Core concepts of contracts, property and comparative law will be discussed. The course will explore property through the lens of Holocaust art and property restitution and delve into issues of corporate social responsibility, including product liability, emerging technologies and the use of the internet. Comparison of American law with that of other nations, with an emphasis on Israel, will be included. Should time allow, we will explore outer space in addition to cyberspace.

In the second semester students examine the rules, principles, and sources of Jewish law. What does court procedure, including the rules of evidence, testimony, and adjudication tell us about the nature of Jewish law? How is the boundary between divine and human law constructed and negotiated? While the course will survey a wide variety of rabbinic materials, specific attention will be placed on selected *sugyot* from *Masechet Sanhedrin*. Traditional commentators (*Rishonim* and *Achronim*) will be studied alongside modern scholars of law, legal theory, and the sociology of law. Among the topics to be discussed are legal fictions and loopholes, the rebellious sage, *agunot*, rabbinic emergency powers of uprooting Torah law, and the death penalty. The course aims to give students a greater appreciation for the sophistication and complexity of Jewish law, its role in shaping Jewish life and culture, and its primacy in our own religious practice today.

Advanced Placement Psychology

This is an elective open to juniors. The focus of this course is to introduce students to the systematic and scientific study of the behavior and the mental processes of both human beings and animals. Students are exposed to the psychological facts, principles, and phenomena associated with each of the major subfields within psychology. They also learn about the methods psychologists use in their science and practice. Among the topics studied are neurology, emotions, sensations, memory, thinking, human development, and psychological health and disorders. The students will have an opportunity to participate in experiments, research, and oral presentations. Teacher recommendation and administrative approval are required for enrollment.

Advanced Placement Macroeconomics

This is an elective open to juniors. AP Macroeconomics is a course designed to provide students with a thorough understanding of the principles of economics by examining aggregate economic behavior. Students taking the course can expect to learn how the measures of economic performance, such as GDP, inflation and unemployment are constructed and how to apply them to evaluate the macroeconomic conditions of an economy. Students will also learn the basic analytical tools of macroeconomics, primarily the aggregate demand and aggregate supply model and its application in the analysis and determination of national income, as well as in evaluating the effectiveness of fiscal and monetary policy in promoting economic growth and stability. Recognizing the global nature of economics, students will also have ample opportunities to examine the impact of international trade and international finance on national economies. Various economic schools of thought are introduced as solutions to economic problems are considered. Teacher recommendation and administrative approval are required for enrollment.

Computer Science

All courses in the computer science department are electives. Teacher recommendation and administrative approval are required.

AP Computer Science A

This course is equivalent to a semester-long, college-level course in computer science. The course introduces students to computer science with fundamental topics that include problem solving, design strategies and methodologies,

organization of data (data structures), approaches to processing data (algorithms), analysis of potential solutions, and the ethical and social implications of computing. The course emphasizes both object-oriented and imperative problem solving and design using Java language. The AP Computer Science A course includes a minimum of 20 hours of hands-on structured lab experiences to engage students in individual or group problem solving. Prerequisite: AP Computer Science Principles. Teacher recommendation and administrative approval are required for enrollment.

Data Science and Intro to Artificial Intelligence

This course introduces students to the main ideas in Data Science (DS), and Artificial Intelligence (AI) through project-based learning. Students will learn to ask questions of data and represent data through visualizations. They will also use critical thinking skills to look at how data is presented to them or used in articles and social media. The projects will range from exploring how AI is used in image recognition or price predictions, to how Spotify creates a shuffle list of their favorite song list. The course will cover the technical side of DS and AI, where students will be introduced to software used in the industry: Python, Pandas, scikit-learn, Colab Notebooks. In addition, the course will examine the implications of DS and AI including Data Ethics, Data Privacy, and how AI impacts all areas of our life.

College Python Programming

College Python Programming is equivalent to a first-semester, college-level course in programming. The course introduces students to coding essentials including problem solving and program design, algorithms (sequence, selection/decisions, iteration/loops), data collection (lists, sets, dictionaries and scalar values), abstractions (procedures, functions), graphical user interfaces and user experience design. This is a project-based learning course where Python applications will be created and explored within a backdrop of traditional problems and more current computer science fields such as data visualization, machine learning, web scraping and integration with engineering projects. Collaboration will also be a key component in the class. Students may opt to earn college credit through LIU upon successful completion of this course.

Engineering

Mechanical Engineering

This course is the third year of engineering track. Students use their independent thinking skills to analyze and critique peer-reviewed hypothesis-driven scientific research articles. This course will extensively cover how to write a research paper that follows strict standards, including organizational techniques, proper citing and how to effectively construct graphs, diagrams and tables. Concurrently, students are expected to design and submit their own groundbreaking research projects to science and engineering fairs. Students will build robots to solve various tasks while learning how hardware interacts with software. Together as a class, students will figure out how to incorporate signal processing, machine learning and computer vision to detect potential or a desired change in a pattern of behavior. Yearlong group projects will require students designing and building mechanical engineering systems. Teacher recommendation and administrative approval are required for enrollment.

Business

All business courses are electives. We have partnered with several local colleges to offer courses for college credits. Students may enroll in these courses at a significantly reduced cost and earn college credits. Enrollment must be approved by the administration.

College Accounting I

The objective of this course is to introduce students to the language of business--Accounting. At the conclusion of the class, students should be able to perform basic accounting functions, understand the concepts of accounting, and be able to use accounting data to make sound business decisions. Students will be able to use software to conduct accounting transactions, including QuickBooks and Excel. We will focus on real world applications of accounting principles. Students can earn three college credits. Teacher recommendation and administrative approval are required for enrollment.

Investments and Entrepreneurship

This is a two semester course. In the first semester, which deals with investments, students learn the basic principles by which the modern corporation manages its assets, controls its liabilities and raises new capital. Topics covered include the valuation and rates of return on securities, financial statement analysis, forecasting, planning and budgeting, working capital management, introduction to capital budgeting techniques, and cost of capital considerations. There is also a focus on security markets and investment opportunities and real estate

transactions. Students are exposed to the concepts of markets efficiency and risk and return. The objective is to provide a systematic method of analyzing investment portfolios. The second semester, Entrepreneurship, deals with marketing strategies and the application of required skills, resources, and techniques that transform an idea into a viable business. Entrepreneurial decision-making is stressed. Students may have the opportunity to engage in a specific entrepreneurial venture when they are given the opportunity to integrate entrepreneurship, marketing, and computer application skills in a simulation that provides students with an in-depth, real-world view of what it is like to run their own restaurant. Using Microsoft Office (or equivalent applications), they will assemble and create all of the documents that a “real” restaurant would need to open its doors. Guest speakers enliven both semesters, and both courses are available for college credit. Teacher recommendation and administrative approval are required for enrollment.

College Virtual Enterprise

Virtual Enterprise is a live global business simulation in which students create and manage a virtual business. The program provides opportunities to develop valuable 21st-century skills in entrepreneurship, global business, problem solving, communication, personal finance and technology. VE replicates all the functions and demands of real businesses in both structure and practice. As “employees” of the virtual business, students experience the expectations of the workplace and are accountable for the firm’s performance. Students can earn three college credits. Teacher recommendation and administrative approval are required for enrollment.

Art

All courses in the Art Department are electives. Teacher recommendation and administrative approval recommendation are required.

Studio Art I

This is the basic art course in which students will acquire knowledge that is intended to lead to a mastery of skills related to the Elements of Art and the Principles of Design. In this course students will maintain an active sketchbook and journal and learn how to use a variety of media and illustrative materials. They will gain a historical knowledge of art by studying facets of art history and exploring artistic reference. Current trends and inspiration of the art world will be included in their studies. Museum and Gallery trips are planned.

Studio Art II

Studio Art II is a second-year course that provides an opportunity for students to expand on the drawing and painting concepts introduced in Studio Art 1. Emphasis is placed on a deeper understanding of design principles, drawing techniques and painting skills leading to the development of abilities that are necessary for advanced art courses. Students are given more in depth problems to solve creatively while becoming more adept through a broad exposure to various media. Students will advance both technically and conceptually, preparing them for the next level of art at North Shore. In addition to refining their artistic skill set, the students will learn about 21st century art and have the opportunity to visit contemporary art institutions. Prerequisite Studio Art I.

AP Art I

Advanced Placement Art I is a distinctive and rigorously demanding course of study which teaches students how to elevate their creative process, critical thinking, investigative skills and 'student voice' in preparation of effectively completing The College Board requirements of the AP Studio Art Exam administered at the end of Senior year. The AP Studio Art Exam consists of a student developed body of successful artwork which will be submitted in a portfolio. The culmination of the student produced artwork during the school year is aimed at conceptualizing and targeting their sustained investigation. The Sustained Investigation section of the AP Art and Design portfolio is a series of works that are very consistent in theme and approach or it may evolve and develop as the visual idea is explored, ending in a different place than where it began and will be scored according to a three-point scale for each of four separate sets of criteria: inquiry; practice, experimentation and revision; materials, processes and ideas; drawing skills. Pre-requisite Studio Art I.

Fashion Design I

The purpose of this course is to introduce students to the world of fashion design. They will acquire knowledge and skills related to the principles of fashion illustration and design by utilizing a range of media and a variety of techniques to create versatility in their work. Students will learn the proportions of the fashion (croquis) figure. They will learn through the elements and principles of design as they pertain to fashion, design terminology for apparel and recognition of design styles are also included as components of the course. Students will be required to demonstrate creative use of inspiration and design experimentation through

various projects and a design journal and will be assessed on their knowledge of terminology, styles and applicability of the elements and principles. Museum and fashion show trips are planned.

Fashion Design II

This design course further encompasses the fashion design process from inspiration through production learned in Fashion Design I. Focus is on developing the fashion silhouette and fabric rendering techniques using a variety of materials. Students will study the interconnectivity between fabric weight/texture and garment representation based on rendered croquis. Principles and creative standards common to all design fields will be introduced. Projects will deal with pragmatic and creative issues. Assignments are progressive so that students will have the opportunity to establish their professional identity. They will utilize a range of media and a variety of techniques to create versatility in their work and portfolio. Additionally, sewing basics will be introduced to students. Students will be exposed to how a historical timeline of fashion is reflective of society. This will help illustrate the ways in which material use has been affected by the technological changes in manufacturing. Museum, fabric store trips, and fashion show trips are planned. Prerequisite Fashion I

Architecture I

This is a course in which basic fundamentals of architecture are examined and perfected. While design will be the main emphasis for this level and the student should have a good background in basic mathematics. Students will learn about the design process and explore the architectural concepts of space, form, function, and technology. Students will learn how to create mechanical and freehand drawings, draw in 1, 2 and 3pt perspective, interpret and create floor plans, create orthographic and isometric drawings, understand drawing to scale and read blueprints, construct scale models, consult with groups on various approaches to design problems, address environmental concerns and conservation efforts, learn to render architectural styles, explore the history of architecture, reference the internet for architectural sources and create computer renderings using CAD. Trips to or visits by working architects are anticipated.

Architecture II

This course is for the student who has completed the requirements for Introduction to Architecture 1 and plans possibly to pursue his or her architectural studies as part of their college education. Students will reinforce skills they

learned in the earlier course and focus in on design techniques, as well as review and study the history of architecture, build scale models from plans and build vertically, understand shape, convex and concave, space, light, acoustics, circulation, enclosure, boundaries, path, threshold and portal, understand the use of planes and their relationship to patterns, consider issues dealing with commercial/ public space, render hand illustrations using a variety of media, become aware of the need for conservancy and the need for buildings that reflect respect for environments and future generations and learn about the history and evolving technologies of modern architecture. Emphasis will switch to vertical construction and consideration of public space vs. private space as well as architectural production as a process of analysis, critique and synthesis. Students will study architectural design as a mode of cultural communication and imaginative experimentation. They will work at a variety of scales, with a variety of techniques in a variety of research situations while being asked to comprehensively address architectural problems. This course aims to broaden and deepen the students' awareness of architecture as a discipline as they work on preparing a portfolio for presentations to colleges: Pre-requisite Architecture I

World Languages

All courses in the World Language Department are electives. Students are encouraged to pursue their study of foreign language if they have completed advanced levels in previous years. Teacher recommendation and administrative approval are required.

French III

The students continue to develop the four basic language proficiencies in a communicative setting. Emphasis continues to be on the acquisition of an extensive active vocabulary that will enable them to communicate in a wide variety of real-life situations. French language skills are enhanced by written application and reading and writing abilities are polished. Maximum communicative practice is afforded by additional concentration on listening skills. French newspapers, short stories and films are presented to stimulate discussion and reading comprehension.

Spanish III

The students continue to develop the four basic language proficiencies in a communicative setting. Emphasis continues to be on the acquisition of an extensive active vocabulary that will enable them to communicate in a wide variety of real-life situations. Spanish language skills are enhanced by written application and reading and writing abilities are polished. Maximum

communicative practice is afforded the student with additional concentration on listening skills. Spanish newspapers, short stories and films are presented to stimulate discussion and reading comprehension.

Spanish IV

The students enrolled in this course master topical vocabulary, grammar, idioms, and practical expressions on an advanced level. They discuss a variety of contemporary themes gathered from authentic materials, including novels. Newspaper article analysis assigned weekly and written paragraphs and essays submitted. This course emphasizes aural comprehension and oral proficiency. Those students wishing to enroll can take this course for college credit from Adelphi University. Three college credits may be earned. (Adelphi Spanish 122)

Mandarin I

Students in Mandarin I begin to develop proficiency in listening and speaking the Chinese language. Proper pronunciation is modeled, and students engage in simple conversation. There is extensive emphasis on vocabulary acquisition. Basic grammatical structures are learned and gradually, with the use of authentic practical materials, they develop the necessary skills for effective and accurate basic oral communication. The culture and civilization of the Chinese-Speaking world is explored.

Eleventh Grade Course of Study: 2023-24

Guidelines

As you proceed through the advisement process, please adhere to the following guidelines:

1. You must take the Foundations and Development of Literature English course.
2. You must register for the U. S. history required course. The AP U.S. History section requires departmental approval. You may select a second history/social science course as an elective; AP U.S. Government requires departmental approval.
3. You are required to take a mathematics course. Placement will be determined by the department based on your math background and past performance.
4. Taking physics as your third-year science course is highly recommended. The Foundational Physics course has been added to facilitate this option. Please speak to your science teacher.
5. Registering for AP courses requires departmental and administrative approval. Some non-AP electives require separate, prerequisite courses and require approval.
6. All courses require a minimum enrollment to be offered.

7. Teacher names are not listed alongside courses. While you may know which instructors are currently teaching a course, do not register for a course based on your assumed teacher preference. Staffing may change.
8. The advisement process is important. We are all present to assist you in making the most optimal program for your junior year educational experience. Your teachers, department chairs, and administration are all ready to help with your decisions. Mr. Nagel will help you with the advisement process and guide you through the approval process if necessary.
9. Your program is not finalized until your college adviser and Mr. Miller.