Academic Program 2019-2020

Northwood School prepares students to shape the future. We engage students in the active pursuit of knowledge and believe that students learn best through exploration and inquiry. Students gain resilience, become independent thinkers, and challenge perspectives by forming relationships with their teachers and peers. The Northwood experience is rooted in the Adirondacks and creates confident, globally-minded students ready to innovate and adapt to our ever-changing world.

Graduation Requirements

Subject	Years	Minimum Required Courses
English	4	A student must be enrolled in an English class every marking period.
Math	3	Algebra I, Geometry, Algebra II
Science (lab)	3	Life science and physical science
Language	2	2 years of the same language minimum, 3 preferred by colleges
History	3	World History and US History
Fine Arts	1	Visual and/or performing arts
Health	1/3	NY State requires all students to earn a high school credit for Health class prior to graduation
Additional Electives	3	These may be from any department
LEAP	Variable	A LEAP course must be completed each year a student is enrolled except senior year.

The above requirements must be met to earn a Northwood diploma. Five academic courses are the standard, full load for Northwood students. Students are urged to challenge themselves academically which, for many, means taking courses well beyond those required for a diploma. Northwood strongly recommends that students take a rigorous academic program for personal growth as well as for the practical purpose of increasing college options.

Honors and Advanced Placement Courses

To qualify to take an AP or Honors-level courses, students must have earned honors grades (a minimum grade of a B+ in the prerequisite Honors course) and have effort grades of Good or Excellent. Teacher recommendations are also required for placement. Exceptions to these guidelines will only be made for special circumstances and after consultation by the current teacher, the Department Chair, and the Dean of Academic Affairs. All students taking AP courses must take the AP exam for that course.

Independent Study Projects

Students who have demonstrated the ability to work at an advanced level with minimal supervision may arrange to pursue an independent study project. Independent study proposals must be completed and returned to the Director of College Counseling or the Dean of Academic Affairs no later than the second week of classes in the trimester in which the project occurs. The student must also find a faculty sponsor who is willing to oversee the project. Once the request for an independent study is received, the Dean of Academic Affairs will consult with the faculty sponsor to consider the proposal.

Northwood School Course Offerings: 2019-2020

English

Introduction to Literature and Composition

Grade level – 9 or 10

As an introduction to literature, this is a survey course focused on a range of diverse authors representing various genres of classic and modern literature. Students will explore fiction novels, memoirs, poetry and drama. The course is also an introduction to composition and will emphasize the basic writing skills needed to be a successful writer. Students will engage in composing their own works in each of the genres we study. Above all, this course is designed to make you think, feel, create and communicate. The course is designed with varied assessments, allowing students different ways to communicate their knowledge and develop skills in the areas of reading, writing, speaking and listening.

Methods and Meaning in English

Grade level – 10 or 11

This course is an examination of language and its role in exploring and describing the human experience. The course emphasizes a thorough study of grammar, from parts of speech, clauses and phrases, on into sentence and paragraph design. In-class writing workshops allow students to post their own writing for group evaluation and editing. Central to the course is a tour of novels and short stories, drama, and poetry, both as vehicles for exploring our world and as models of artistic excellence.

Literary Themes and Analytical Writing (Regular and Honors)

Grade level – 10 (Honors), 11 or 12

This course focuses on exploring themes in literature and writing analytically to engage deeply with texts and, by extension, ourselves. We will work across genres, using literature, film, art, and the world around us as we explore what it means to be human. Through close reading, consistent annotation, critical thinking, and thoughtful reflection, students will engage deeply with texts. We will continue to build upon critical writing skills while also developing distinct and sophisticated writers' voices. This course is highly interactive, with an emphasis on student engagement and contribution to discussion and class activities.

Advanced Composition and World Literature

Grade level – 11 or 12

Using psychological, historical, and philosophical perspectives, this course focuses upon critical analysis of important international and American fiction, poetry and drama. Most of the writing assignments for the course involve analysis of this literature, but creative essays, peer editing, a research paper, sophisticated classroom discussions, and student class presentations develop the skills necessary for verbal courses at the college level.

A.P. English Language and Composition

Grade level – 11 or 12

Prerequisites: honors grades in previous courses and teacher recommendation.

Offered in alternate years- this is a nonfiction-based course designed to give students a broad acquaintance with nonfiction, chiefly in the form of essays and long-form journalism; to hone their writing skills through essay assignments in the various genres of nonfiction that we study; to give them a useful grounding in techniques and strategies of rhetoric, as well as in techniques of rhetorical analysis; and to prepare them for the A.P. Language and Composition exam.

Electives

Journalism (trimester or full-year elective)
Journalism will explore the history and tenets of American journalism and provide students with an opportunity to research and write articles and editorials for publication. The focus of the class will be to produce a student-run school newspaper, *The Mirror*. Writing-intensive, the course aims to help students develop the full spectrum of skills used for feature articles, interviews, news articles, photojournalism pieces, and editorials. Students learn how to generate ideas, gather facts and information, write effective leads, and use the most incisive language to convey ideas in a concise and engaging manner. It is open to all students. Offered each trimester; students may take the course for one or more trimesters.

Linguistics (trimester or full-year elective)
Linguistics is a year-long course that prepares students for success in the writing process both during and beyond their years at Northwood. Composition and writing fluency are a primary focus, along with advanced grammatical structures. Essay writing and organization of thoughts and information serve as the backbone of this course. Drafting, revising, and editing foster an understanding of a well-crafted writing sample. Deconstructing the use of various parts of speech, while examining the relationship between phrases, clauses, and sentences allow for a more thorough understanding of advanced English grammar. In addition to experiencing the writing process, students will find support through college entrance examination preparation. Linguistics will assist learners with the difficult task of navigating rigorous exams such as the SAT or TOEFL. The deciphering of expository texts and acquisition of complex vocabulary words will better prepare students for such exams.

Social Science

Foundations of the Modern World
Grade level – 9 or 10
The course introduces students to the foundations of World History. Content includes the study of early civilizations (Middle East, India, China, Africa, and Americas), Greece, Rome, the rise of Europe, and the beginnings of a global age. The course provides students with a perspective on past events that have come to shape the present conditions of the modern world. Emphasis will be placed on organization, writing, communication, and critical thinking skills.

The Modern World (Regular and Honors)
Grade level – 10 or 11
Building on the material covered in Foundations of the Modern World, the course completes students' study of World History by providing an in-depth look at the world's major cultures. Study of each of these societies will emphasize culture and geography, family life and structure, social organizations, education, religious beliefs and institutions, economic systems, political trends, and the intellectual and artistic accomplishments of individuals within the culture. The study of each culture will be supplemented by the development of reading, writing, research, geography, critical thinking, study/note taking skills, as well as technological and presentation skills.

ESL World History
Grade level – 9 or 10
This course is designed as both an introductory course and an historical survey course that will enhance a student's knowledge of key people, places and events that have profoundly shaped the course of world history. Students will explore the key events that have influenced the development of civilizations and cultures for the past 5,000 years while developing reading, writing, researching, and note taking skills. They will also work with technology and make oral presentations. Students in this course will receive additional vocabulary and writing support in their ESL class.

United States History
Grade level – 11
United States History introduces students to the study of American History. Examination of Colonial British North America, the American Revolution and framing of the Constitution shape our early study. Important themes from this material will then be examined throughout the remainder of the course. Students will develop an understanding of American history and improve their essential communicative and critical thinking skills through emphasis on writing, the formation of historical arguments, and development of analytical reading skills through a variety of media. Film, online databases, books, online journals, and academic web resources expose students to a wide spectrum of opinions and views on American history. From this, students will form their own opinions and produce original work.

ESL United States History
Grade level – 11 or 12
Paralleling the US History course, this course moves at a slower pace for second language learners and incorporates more project-based learning.

Advanced Placement World History
Grade level – 10
Prerequisites: honors grades in previous course and teacher recommendation.
This course is designed to be the equivalent of an introductory college level world history course. Students will investigate significant individuals, events, developments, and processes in six historical periods from approximately 8000 B.C.E. to the present. Students develop and use the same skills, practices, and methods employed by historians: analyzing primary and secondary sources; developing historical arguments; making historical comparisons; and utilizing reasoning about contextualization, causation, and continuity and change over time. Throughout the course, five themes will be explored allowing students to make connections among historical developments in different times and places: interaction between humans and the environment; development and interaction of cultures; state building, expansion, and conflict; creation, expansion, and interaction of economic systems; and development and transformation of social structures.

Advanced Placement United States History
Grade level – 11
Prerequisites: honors grades in previous course and teacher recommendation.
This AP course is the equivalent of an introductory level college survey course. It will emphasize the skills, themes, and time periods of American history as laid out by the College Board in their recent curriculum redesign. Students will learn a significant volume of material through classroom instruction as well as independent learning. Through the year, students will familiarize themselves with the issues surrounding the settlement of, development of, and rise of America. Topics include the evolution of Colonial British North America, the American Revolution and Constitution, the growth and expansion of the nation during the 19th century, the rise of industry in the late 19th century, Secession, Civil War, and Reconstruction, the evolution of equality, and major historical issues of the 20th century.

Advanced Placement Psychology
Grade level – 11 or 12
Prerequisites: honors grades in previous course and teacher recommendation.
This AP course provides an overview of current psychological research methods and theories. Students explore the therapies used by professional counselors and clinical psychologists and examine human reactions: how people learn and think, the process of human development and human aggression, altruism, intimacy, and self-reflection. Students study the core psychological concepts, such as the brain and sense functions, and learn to gauge human reactions, gather information, and form meaningful syntheses. The equivalent of a 100-level college survey course, AP Psychology prepares students for further studies in psychology and life sciences. To help prepare students for the AP exam,

each unit exam is designed to replicate the AP Psychology exam. Students also participate in a variety of experiments. These range from quick in-class exercises to replications of famous experiments to self-designed experiments.

Advanced Placement Macroeconomics
Grade level – 11 or 12
Prerequisites: honors grades in previous course and teacher recommendation.
AP macroeconomics is a college-level course which gives students a thorough understanding of the principles of economics. Essential concepts that are explored include the functions performed by an economic system, and the way the tools of supply and demand are used to analyze the workings of a free market economy. Students will learn the distinction between absolute and comparative advantage and apply the principle to determine the basis on which mutually advantageous trade can take place between individuals and/or countries, and to identify comparative advantage from differences in opportunity costs. The course also introduces the business cycle to give students an overview of economic fluctuations and highlight the dynamics of unemployment, inflation, and economic growth.

Introduction to Entrepreneurship (year-long course)
Entrepreneurship is the process of growing ideas into a viable business or organization, and the entrepreneurial spirit is a mindset of how one approaches problems and proposes solutions. In the first trimester, the course will cover some of the basics of entrepreneurial management, marketing, and finance needed to launch new businesses. Students will acquire a toolkit for identifying and forming a new venture including creative thinking, critical thinking, problem-solving, collaboration and communication. In the second trimester, students will have the opportunity to formulate great ideas, turn them into business plans, and deliver on new technologies, products, and services. In the third trimester, Northwood students working in small groups will partner with local entrepreneurs and businesses to develop solutions to existing problems. Teamwork will be critical as the answers to these issues will not be found in a book. Students will utilize the various strengths of their teammates to create sophisticated solutions validated through research, interviews, and field work.

Trimester Electives

Philosophy and Ethics of Science Fiction and Fantasy
The Philosophy and Ethics of Science Fiction and Fantasy is a demanding college preparatory philosophy course. Students will acquire a basic understanding of philosophy and ethics by studying contemporary and classic science fiction books and movies. Critical thinking and writing skills, solid reading, and a dedicated work ethic are necessary to succeed. Course work will include the completion of identification terms, quizzes, exams, papers, presentations, discussion, and debate.

Introduction to Human Rights
The goal of this course is for students to understand the key historical, political, legal and moral influences that have shaped the idea of human rights, both in the U.S. and internationally. Students will be able to explain the concept of human rights and analyze the contemporary challenges and trends in human rights theory and practice. In addition to exploring historical events, the course will focus on current issues that are constantly emerging in the development, practice, and enforcement of human rights. Students will learn how to construct and advocate effective arguments as they analyze some of the challenges of contemporary human rights advocacy.

Anthropology
This introductory course will cover the four pillars of anthropology: physical anthropology, archaeology, linguistic anthropology, and cultural anthropology/ethnology. Central themes of study are concepts of culture, society, pre-state societies (tribes/chiefdoms), state societies (agricultural/industrial), consequences of global industrialism, and the global future of indigenous

tribes. The course will explore anthropological perspectives, stress critical-thinking processes, and develop skills to analyze fossil evidence, artifacts, languages, and cultural beliefs/values.

International Relations: The Politics of Genocide and Terrorism
International Relations examines major international issues today such as terrorism and the proliferation of weapons of mass destruction, globalization and the growth of transnational agencies and economies, the preponderance of failing states because of the spread of ethnic and religious intolerance, and specific conflicts such as those in the Korean Peninsula or the Balkans. American foreign policy, the origins of genocide, Stalin & Mao, the Jewish Holocaust, Cambodia & the Khmer Rouge, Bosnia & Kosovo, and the apocalypse in Rwanda will also be examined in this course. Students will be required to conduct research to prepare for role-plays and debates on current issues.

Sociology
Sociology introduces students to the theories, concepts and areas of inquiry that typically characterize sociological analyses, specifically, culture, society, socialization, social interaction, social groups, deviance, race, ethnicity, sex and gender. We will also focus on the various social institutions (family, marriage, death, etc.) Topics include health care, media, popular culture, violence, crime, and punishment. The course will apply a three-stage process; opening discussions that draw on students' ideas and experiences; lectures/ presentations and readings that present a sociological perspective; and critical discussions that will explore analysis and synthesis of current social trends.

World Politics
World Politics will focus on the current state of political systems around the globe, emphasizing contemporary world powers and their struggle for dominance in political, social, economic, and religious arenas. From bi-polar, tri-polar and hegemonic power struggles to the specific Middle East conflicts in Iraq, Iran, and Afghanistan, the course will also explore a multitude of conflict resolutions. Students will learn to use effective techniques of discussion, Excel spreadsheets, and PowerPoint. Additionally, students will hone their skills in writing analytical essays, outlining, note taking, debating, and making oral presentations. The course will address the following topics: health care, crime and drugs, immigration, defense, global security, weapons proliferation, as well as current international conflicts from the Arab-Israeli Conflict to North Korea, the Arab Spring, and Iran.

Mathematics

Algebra I
This first-year algebra course introduces students to the abstract nature of mathematics and stresses the importance of developing competence in basic algebra skills.

Geometry
Prerequisites: Algebra I
Geometry is a traditional class in Euclidian geometry. Postulates about points, lines, and planes will develop inductive reasoning skills. The course covers all traditional geometry topics.

Algebra II (Regular and Honors)
Prerequisites: Algebra I and Geometry; enrollment in the Honor's section requires honors grades in previous courses and teacher recommendation.
This second-year algebra course introduces exponential and logarithmic functions. An Honors section of the class also introduces students to right triangle trigonometry, the laws of sines and cosines, radian measure of angles and the graphs of the sine and cosine functions.

Algebra III/Trigonometry
Prerequisites: Algebra II or equivalent

Algebra III prepares students for introductory college math classes. Topics covered include problem solving and reasoning, numeration systems and number theory, graphing functions, trigonometry, probability, statistics and personal financial management. The course is designed for students whose mastery of concepts introduced to them in an Algebra II course is still developing.

Pre-Calculus (Regular and Honors)
Prerequisites: Algebra II; enrollment in the Honor's section requires honors grades in previous courses and teacher recommendation.
Pre-calculus builds upon mathematical and analytical concepts introduced in Algebra II and prepares students for upper level mathematics courses, both at the secondary and collegiate levels. Students study linear, quadratic, polynomial, rational, exponential and logarithmic functions, analytic geometry, triangle trigonometry and trigonometric functions, complex numbers, probability, and statistics. The Honor's section of this course covers additional topics and prepares students for the Advanced Placement sections of Calculus and Statistics.

Calculus (Honors)
Prerequisites: Pre-calculus, honors grades in previous courses and teacher recommendation.
Calculus explores the concepts of derivative and integral calculus to give students a solid foundation upon which to build mathematical knowledge in future courses. Specifically, students study functions and different representations of functions (graphically, numerically, algebraically, etc.), limits, derivatives and differentiation, applications of derivatives, definite integrals, indefinite integrals, and applications of integrals. Students should have a strong foundation and demonstrated understanding of functions (polynomials, exponential, logarithmic, trigonometric) from a Pre-calculus course.

Statistics
Prerequisites: Algebra II or equivalent.
Statistics' students explore statistical concepts central to the analysis of data in many science and social science disciplines. Specifically, students explore data to describe patterns, departures from patterns, and associations between variables; plan and conduct experimental studies; investigate chance and random processes using probability and simulation; and learn how to objectively estimate population parameters and scientifically test hypotheses using statistical inference. Critical thinking, inferential reasoning and communication – both oral and written – are emphasized over computation and algebraic manipulation. Use of technology – graphing calculators, spreadsheets and statistical analysis software – is prevalent throughout the course.

AP Calculus/AB
Prerequisites: Pre-calculus, honors grades in previous courses and teacher recommendation.
These courses prepare students for the AP Calculus exams. The AP course covers topics in differential and integral calculus, including concepts and skills of limits, derivatives, definite integrals, and the Fundamental Theorem of Calculus. The course teaches students to approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections amongst these representations. Students learn how to use technology to help solve problems, experiment, interpret results, and support conclusions.

Lab Science

Health
This is a 1 trimester pass/fail course (not counted in the student's course load). *By law, all students in NY State must earn a high school health credit to graduate*. Health presents material students need to understand how to become and stay healthy. This pass/fail class discusses major

health concerns and provides each student the skills necessary to weigh options, make responsible decisions, and develop behaviors that promote a healthy lifestyle.

Biology (Regular and Honors)
Grade level – 9 or 10
Prerequisites: enrollment in the Honor's section requires honors grades in previous courses and teacher recommendation.
Biology introduces the basic concepts of life science with an emphasis on how they relate to daily life. Topics include ecology, biological diversity, chemistry of life, cellular structure and function, genetics, evolution, and human systems. Critical thinking activities, laboratory exercises, and classroom discussions about biology in our everyday lives reinforce this knowledge. Field trips utilize the natural resources of the Adirondack Mountains to apply the concepts to local ecology. Students also gain experience by dissection, solving practical problems, and analyzing experimental data.

Chemistry
Grade level – 10 or 11
Prerequisites: biology and must be enrolled in Algebra II
Chemistry develops a foundational understanding of major concepts in the field such as atomic theory, periodic law, chemical bonding, and stoichiometry. Critical thinking activities, laboratory exercises, and classroom discussions about chemistry in our everyday lives reinforce this knowledge. Students also gain experience writing lab reports, solving practical problems, and analyzing experimental data.

Honors Chemistry
Grade level – 10 or 11
Prerequisites: honors grades in biology and math, enrolled in Honors Algebra II, and teacher recommendation
Honors Chemistry introduces the basic concepts of chemistry. The course provides extensive laboratory experience to develop students' experimental and problem-solving skills and prepares students for college chemistry courses by covering topics in more detail. Topics covered include matter, atomic theory, electrons, chemical bonding, nomenclature, mole concepts, chemical reactions, stoichiometry, gas laws, molecular structures, solutions, equilibrium, acid-base reactions, redox, and nuclear chemistry.

Geology
Grade level – 9, 10, 11 or 12
Prerequisites: none.
Geology investigates the structure of the earth with a focus on local landscapes. Topics include the Earth's formation, mineralogy, plate tectonics, weathering/erosion, mountain building, and surface geomorphology. Labs and field trips are essential components of the course. Local topographic features, including rocks in the High Peaks and Ausable River, will be studied in the field, mostly during the spring trimester.

Physics
Grade level – 11 or 12
Prerequisites: biology, chemistry, and must be enrolled in Pre-calculus.
Physics develops the student's observational and analytical problem-solving skills. Theoretical concept development is emphasized along with problem-solving and laboratory skills. A background in algebra is assumed, and trigonometric concepts are required components of our study. The course covers classical mechanics including kinematics (the description of motion in one and two dimensions), dynamics (the causes of motion, Newton's laws of motion), and the conservation laws (energy and momentum). In addition, we study topics selected from statics, waves, sound, and light. Several projects through the year integrate physics principles with elements of engineering and technology.

Honors Physics
Grade level – 11 or 12
Prerequisites: honors grades in math and chemistry, enrolled in Honors Pre-calculus, and teacher recommendation.
The course moves at a faster pace than physics and covers the following material in depth: classical mechanics including kinematics (the description of motion in one and two dimensions), dynamics (the causes of motion, Newton's laws of motion), and the conservation laws (energy and momentum). In addition, we study topics selected from statics, waves, sound, and light. Several projects through the year integrate the physics principles studied with engineering and technology to achieve a deeper understanding of the topics.

Environmental Science
Grade level – 11 or 12
Prerequisites: two lab sciences including biology.
Environmental Science is a broad scientific survey course designed to garner a holistic perspective and improve the student's ecological literacy. The goal is to ignite systems thinking and develop the skill set needed to discover answers and analyze options, and to utilize ecological systems as a successful model to help us deal with environmental issues. Ultimately, this perspective and the accompanying skills help build a framework for decision making for use throughout life.

Human Biology
Grade level – 11 or 12
Prerequisites: biology and one other lab science.
Human Biology takes a hands-on approach to learning the structure and function of human body systems. The course aims to expand the student's current knowledge of how the human body works, starting with the molecules of life and continuing through all major body systems. During the comprehensive study of the systems, students will understand more fully how their daily activities affect their health now and in the future. Students will also relate how disease leads to loss of functioning in the systems. Labs include dissections of a number of major animal organs. Students will also have the opportunity to get American Red Cross First Aid and CPR certified upon successful completion of the First Aid unit.

AP Biology
Grade level – 11 or 12
Prerequisites: honors grades in biology and chemistry, and teacher recommendation.
Offered to qualified students who have successfully completed biology and chemistry with a record of high achievement in the sciences. AP Biology is a challenging full-year college-level introduction to the study of biology. The course is laboratory based, examining life from the molecular and cellular levels through organisms, genetics, and evolution. Throughout the year, students will develop advanced inquiry and reasoning skills, such as designing a plan for collecting data, analyzing data, applying mathematical solutions, and connecting concepts in and across areas of study. All students must take the national AP Exam in May.

AP Environmental Science
Grade level – 11 or 12
Prerequisites: honors grades in biology and chemistry, and teacher recommendation.
The AP Environmental Science course is the equivalent of a one semester, introductory college course in environmental science; it includes geology, biology, ecology, chemistry, economics, sociology, politics and geography. Classes include lectures, hands-on activities, student presentations, labs, fieldwork, class discussions, group projects, films and guest speakers. The key themes of the course are co-evolution and energy flow through systems. The first trimester explores how these themes play out in ecosystems while the second and third trimesters investigate how humans have impacted these ecosystems as well as efforts to mitigate the negative impacts of humanity. While designed to prepare

students for the AP exam, the course fundamentally creates systems thinkers and holistic problem solvers.

Trimester Electives

Rocket Science (spring and fall trimester elective)
In this hands-on course, the design process will be emphasized as students incorporate science, computer modeling, engineering, and math to design, build, and launch their model rockets. Teamwork and problem solving will also be important skills developed over the course of the trimester.

The Physics of Winter Olympic Sports (winter trimester elective)
What is the science behind the sports in the Winter Olympics? This course offers an introduction to physics (dynamics) through the study of the Winter Olympic sports of bobsled, biathlon, curling, figure skating, hockey, luge, and skiing. Through hands-on discovery, demonstrations, videos, and articles, students will learn about the concepts and fundamental laws connected to Winter Olympic sports.

Molecular Genetics (Advanced biology elective, Spring)
A course exploring how genetic information is revealed by the structure and function of nucleic acids. The molecular basis of replication and gene expression will be introduced, and the biotechnology used to study the processes of molecular genetics. Prerequisite: Biology and Chemistry (or currently enrolled in Chemistry).

Innovation, Engineering and Entrepreneurship

<u>Northwood School Robotics Courses</u>
This curriculum offers beginner and advanced sections and is intended to introduce students to hands-on, project-based applications of the engineering process. Students design, build, test and program robots, utilizing the programming languages and logic skills covered in the course curriculum. Students will develop logic skills, gain proficiency in appropriate programming languages and will develop an intimate understanding of the engineering design process and the mechanical, electrical, and software components of robotics. Students in both courses will have the opportunity to compete on one of Northwood School's robotics teams at national/international high school robotics competitions. Integration of 3D printing design and modeling is intended to support skill development in all areas of this course.

Introduction to Robotics and Computer Programming (trimester elective)
Open to all levels.
This course will focus on basic skill development and requires no programming experience. Students will be members of the Northwood VEX EDR robotics team (Team #12946), designing and building robots for the VEX Robotics Competition (during the winter trimester). Students will face game specific engineering challenges and will be required to develop the necessary skills to build effective robots. A thorough introduction to robot programming using Robot C will help students develop fundamental programming-based logic skills. Grading in this course is based on successful completion of projects and level of proficiency in skill areas.

Applied Robotics (honors-level year-long course)
This course is designed to be an intermediate/advanced level course and students are expected to have a basic knowledge or experience with logic and computer programming. Students will be members of the Northwood FIRST FRC robotics team (Team #6300). Students will design and build industrial robots from scratch – mastering the fundamental concepts in the process. Mechanical assembly, drive

train design, electrical wiring, Java programming, mechanical engineering and robot command and control are skills students will develop in this process. This course will employ advanced 3D printing tools and develop skills for 3D model and part design. Grading in this course is based on successful completion of projects and level of proficiency in skill areas.

Introduction to 3D Modeling and Fabrication (trimester elective)
Open to all levels.
This course introduces modern 3D design, modeling and fabrication skills. Students learn basic CAD drawing and assembly skills to create software-based models. Spatial resolution, dimensioning and part integration skills are developed through a series of design projects. Students develop an understanding of CAD software and file management in the creation of 3D parts. 3D printing, CNC (computer numeric control) routing and laser cutting/engraving machines are utilized to bring CAD designs to life. Students are trained in the use of these machines and develop an understanding of the design and prototyping process from start to finish. Finally, model evaluation, fabrication troubleshooting, and quality control techniques give students who complete the course the ability to design, draw and create their own high-end products.

Innovation with Design Thinking (trimester elective)
Open to all levels.
Where do great ideas come from and how are the physically realized? The Innovation and Design Thinking course grows creative thinking and supports the "building" of projects through a wide range of tools and materials. Projects and prototypes will be built from kernels of an idea generated in brainstorming, that are brought to life in sketches and plans, then transformed into actual builds using multiple iterations and modeling. Students will learn to use both digital and hands-on tools including Adobe Illustrator, Photoshop, hand tools, power tools, the C & C machine, the laser cutter, 3-D printers and more. Students will also learn and practice effective communication skills by sharing and proposing solutions, working with teams of collaborators, and marketing and presenting their work. This course is for anyone who wants to be creative, sees him or herself as a dreamer or maker, or anyone who would like to become one.

Rocket Science (spring and fall trimester elective)
In this hands-on course, the design process will be emphasized as students incorporate science, computer modeling, engineering, and math to design, build, and launch their model rockets. Teamwork and problem solving will also be important skills developed over the course of the trimester.

The Physics of Winter Olympic Sports (winter trimester elective)
What is the science behind the sports in the Winter Olympics? This course offers an introduction to physics (dynamics) through the study of the Winter Olympic sports of bobsled, biathlon, curling, figure skating, hockey, luge, and skiing. Through hands-on discovery, demonstrations, videos, and articles, students will learn about the concepts and fundamental laws connected to Winter Olympic sports.

Introduction to Entrepreneurship (year-long course)
Entrepreneurship is the process of growing ideas into a viable business or organization, and the entrepreneurial spirit is a mindset of how one approaches problems and proposes solutions. In the first trimester, the course will cover some of the basics of entrepreneurial management, marketing, and finance needed to launch new businesses. Students will acquire a toolkit for identifying and forming a new venture including creative thinking, critical thinking, problem-solving, collaboration and communication. In the second trimester, students will have the opportunity to formulate great ideas, turn them into business plans, and deliver on new technologies, products, and services. In the third trimester, Northwood students working in small groups will partner with local entrepreneurs and businesses to develop solutions to existing problems. Teamwork will be critical as the answers to these

issues will not be found in a book. Students will utilize the various strengths of their teammates to create sophisticated solutions validated through research, interviews, and field work.

Language

French I
Prerequisites: none.
This course is designed as an introduction to language learning. In addition to learning basic grammatical concepts, students develop listening, reading, and speaking skills in the French language. This is an introductory course and no prior language study is required.

French II
Prerequisites: French I.
This course is a continuation of first year French. It strives to cultivate a true interest in French language and culture. Through building on the basics of French I skills, French II enables students to communicate in simple sentences in spoken or written French. It also widens students' worldviews by introducing them to French speaking cultures.

French III
Prerequisites: French I, II.
This course is a continuation of French II. It is designed to broaden the student's outlook on life and the world around him/her. It opens doors to future career choices: it helps students learn about themselves as they become more aware of others, and it aids in communication skills. All basic verb tenses are studied, vocabulary acquisition is emphasized, and daily speaking and listening are an essential part of the course. Students write short compositions in French.

French IV / V (Honors)
Prerequisites: French I, II, III.
This is an advanced honors-level French class offered to qualified students who show genuine interest in mastering the language and understanding the culture. Classes are given in French entirely. During the early part of the year, emphasis is placed on grammar review, verbal expression using basic vocabulary and reading short stories. Later in the course, we concentrate on more difficult grammatical concepts, more sophisticated vocabulary and reading French literature. Throughout the year students are required to present their work both orally and/or in written form.

Spanish I
Prerequisites: none.
This course explores Spanish cultures both in the western hemisphere and Spain as a welcome to the spoken and written language. Students learn basic vocabulary and grammar as they begin to build a foundation in a language that is fast becoming an essential in the United States.

Spanish II and III
Prerequisites: Spanish I or II.
These courses build upon the fundamentals learned in Spanish I. Classroom focus is on conversational Spanish, while homework includes practice on grammatical skills and mechanics. Readings include analysis of short stories and Spanish literature as it pertains to Spanish speaking cultures.

Spanish IV/V (Honors)
Prerequisites: Spanish III or IV with grades of B.
This is an advanced honors-level Spanish class for students who have mastered the skills taught in levels I, II, and III, and who have earned at least a B grade. Advanced grammatical skills are reviewed throughout the year in addition to readings of sophisticated literature, compositions, comprehension-based activities, and group project-based learning. Authors include Lorca, Marquez, and Neruda.

* Some of our students choose to study additional languages online. We have worked with Middlebury Interactive Languages and OneSchoolHouse to oversee Latin, German, and AP Spanish courses.

The Arts

Approaches in Acting (trimester elective)
Open to all levels.
This active, fun class will be based in practical work, supported by theory. Students will have the opportunity to explore their skills in monologue and scene work. Focus will be on breaking down a script and the development of the voice and the body to confidently communicate onstage. No prior experience necessary. The course is valuable to those who are interested in pursuing theatre in the future as well as those who want to use it as a vehicle to improve their confidence, creative thinking and expressive communication skills.

Fundamentals of Art
Open to entry-level artist.
This class is for the student who would like to explore the studio spaces we have to offer so they are better prepared to take more specialized art courses later in their Northwood career. They will learn basic drawing techniques and produce a painting and a reduction cut print. They will work with clay, glass, plaster, and wood to create simple sculptures. Successful students will be creative while developing good techniques and following directions.

Printing
Open to all levels.
This class will introduce students to basic printing techniques including block printing, reduction printing, Gelli printing, and silkscreen.

Drawing
Open to all levels.
This class will explore the basic elements of art and design. Line, shape, space, texture, and value will be the basis of all projects. Using primarily black and white colors, students will experiment with charcoal and pencil to create drawings from real life, photographs, and their own imagination.

Advanced Drawing
Prerequisites: Drawing or permission from the instructor.
Students in this class will venture into perspective, composition, realism, and abstraction using black and white and color.

Painting
Open to all levels.
Painting is designed for the artist who wants to work two-dimensionally. This class will focus on creating works of art within the boundaries of color theory. Acrylic paint will be the dominant material on various surfaces. Art history will also be an important part of this class.

Advanced Painting
Prerequisites: Painting or permission from the instructor.
Students will discuss and explore concepts of composition and value. Working from real life and photos, students will be encouraged to take more risks, devote more time to their work, and think outside the box. Materials used will be oil, pastel, and acrylic. Art history will also be an important part of this class.

Advanced Studio Art (Honors, two-trimester course)
This honors-level class is for the student who has taken drawing 1 & 2 or painting 1 & 2. Advanced studio art will enable students to further develop his/her portfolio, learn more in-depth exploration of selected mediums and expand art history knowledge. Students taking this course must have a passion for the arts and be self-motivated. This is a two-trimester course.

Ceramics
Open to all levels.
Neat freaks need not apply; it is a dirty world. Ceramics is Northwood's most hands-on, tactile art experience. Every project starts will a lump of clay. To create both functional and sculptural ceramics, students learn to pinch, coil, slab, carve, extrude, and throw on a wheel. Ceramics is a two-part process; projects are created, then bisque fired in an electric kiln. Students learn about all the painting and glazing techniques available to make their work burst with color in the final firing. The class will understand the roots of ceramics with a pit or barrel firing and study some contemporary potters and how they work today.

Raku
Prerequisites: Ceramics or permission from the instructor.
Raku is an advanced ceramics course that explores the 16th century Japanese firing process and its contemporary counterparts. In Raku, pots are taken from the kiln molten hot and either allowed to air-cool or are placed in reduction barrels full of flammable materials meant to bring out the shine in specialized glazes, similar to processes in our ceramics course but with less functional pottery and more fire. Pieces tend to be more sculptural but are all created either by hand-building or throwing on the wheel. The class bisque fires and accumulates pieces throughout the winter, then the course culminates with an all-day outdoor Raku firing in the spring to finish each piece.

Sculpture
Open to all levels.
In sculpture, students explore art in three dimensions. Students will learn to create beyond the page using wood, clay, glass, plaster, wire, organic, and found objects. Sculpture is a hands-on course; students should be prepared to get dirty and make decisive, tactile decisions. Gaining the knowledge to use small hand tools for basic construction and adhesion, they will learn to carve, mold, build, and make sculptures through both additive and reduction techniques. Students will use contemporary and historical sculptors as inspiration for their projects.

Digital Imaging
Open to all levels.
Exchanging paint for pixels, digital image making explores the world of digital media. The foundation of this course is digital photography; students will begin the course learning camera controls and composition. Using Adobe Photoshop, Bridge, and InDesign, students will learn how to enhance, manipulate and make images come alive in the digital world. Students will understand the basics behind fonts and layering. They will have the opportunity to create stop motion videos, collage and photo essays. Along the way, they will learn about the contemporary photographers and graphic designers who will inspire their work. Most of the homework will involve the camera; a powerful tool for students to explore the world around them.

Innovation with Design Thinking
Open to all levels.
Where do great ideas come from and how are the physically realized? The Innovation and Design Thinking course grows creative thinking and supports the "building" of projects through a wide range of tools and materials. Projects and prototypes will be built from kernels of an idea generated in brainstorming, that are brought to life in sketches and plans, then transformed into actual builds using multiple iterations and modeling. Students will learn to use both digital and hands-on tools including Adobe Illustrator, Photoshop, hand tools, power tools, the C & C machine, the laser cutter,

3-D printers and more. Students will also learn and practice effective communication skills by sharing and proposing solutions, working with teams of collaborators, and marketing and presenting their work. This course is for anyone who wants to be creative, sees him or herself as a dreamer or maker, or anyone who would like to become one.

Adirondack Art Exploration
A creative exploration of art and artists who lived or live in the Adirondacks. This course will go more deeply into the lives of the artists and the medium they used**.**

Band (trimester or year-long course)
For students with a basic working knowledge of an instrument.
Band focuses on developing individual musical skill as well as working together as a performing group. The focus will be on how chord voicings, melodies, and dynamics work together to create interesting music, and how particular instruments work within songs. Exploration and listening will be emphasized. This course is designed for musicians who would like to take their playing to the next level in a band setting. Singers are welcome!

Guitar
Open to all levels.
Guitar is for beginner musicians as an introduction to music. Students learn about chords, rhythm, and simple melody. They will also read simple chord charts and use online resources to play their favorite songs. The goal is to gain comfort and confidence with an instrument and to learn how to play songs they enjoy competently. The course is geared towards acoustic guitar, but electric guitar, bass, and ukulele are also options.

Advanced Guitar
Prerequisites: previous guitar instruction or competency.
This course explores guitar techniques as they apply to different musical genres: jazz, soul, funk, rock, pop, bluegrass, etc. As an advanced guitar class, it builds upon the foundations of music already learned and strives to help students advance in their musical abilities and become more familiar with the fretboard. Sonic possibilities in the forms of effects and tunings will also be explored. We will explore how to best work with a full band, how to decide what to play in different contexts, and how to better listen and interact with other musicians. Students will play and practice as an ensemble and with the larger band as well.

Music Recording
Open to all levels.
This course will introduce students to recording using professional recording software called Digital Performer, a digital audio workstation and MIDI sequencer well suited for songwriters, live performance, film and video soundtracks, audio post-production, surround mixing, and other professional audio production tasks. The software will record, edit, arrange, mix, process, and master audio and MIDI tracks. We will begin with recording live sounds and instruments and then delve into pre-recorded music. We will also utilize the MIDI controller to recreate sounds and put new songs together.