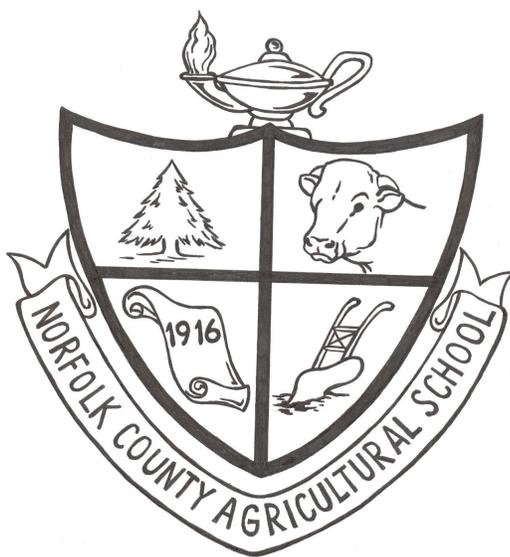


NORFOLK COUNTY AGRICULTURAL HIGH SCHOOL



PROGRAM OF STUDIES

2021-2022

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The Norfolk County Agricultural High School does not discriminate on the basis of race, color, sex, gender identity, sexual orientation, religion, national origin, disability status, genetic information and testing or the Family and Medical Leave Act in its education activities or employment practices as required by Title IX of the 1972 Federal Education Amendments, by Section 504 of the 1973 Rehabilitation Act and by Chapter 622 of the General Laws of the Commonwealth of Massachusetts.

NEW ENGLAND ASSOCIATION
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ACCREDITED MEMBER

INTRODUCTION



Norfolk County Agricultural High School
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The Program of Studies that follows describes the promotion and graduation requirements, a comprehensive Course Catalog and other information pertaining to the educational program at the Norfolk County Agricultural High School (NCAHS). Students and parents/guardians are urged to become thoroughly familiar with the information contained in this booklet. They should refer to the Program of Studies annually as they make decisions about programs and courses in preparation for transitioning to college or a career.

The educational program at NCAHS is structured to prepare every student for attainment of a high school diploma, post-secondary education and future employment, preferably in an occupation related to agriculture. Preparation for career success is an essential component of the education offered at NCAHS. NCAHS remains committed to the importance of work-experience and career-preparatory programs.

NCAHS PHILOSOPHY AND GOALS

NCAHS Mission statement:

The Norfolk County Agricultural High School uniquely provides an academic and agricultural science vocational experience, with hands-on learning for passionate students from diverse communities. Supported by an inclusive community, students are prepared for college, work, or public service in their chosen career path. Students leave with the skills and confidence to succeed in all future endeavors.

NCAHS Motto:

We are work-ready. We are world-ready. We are life-ready. We are Norfolk Aggie!

The Norfolk County Agricultural High School believes agriculture and agribusiness are essential to regional, national, and global economies. We recognize that agricultural and environmental technologies are vital to global survival. Therefore, it is our mission to offer progressive agricultural education, a challenging academic curriculum, and work experiences that prepare our students for continued learning. We are committed to providing a quality educational environment that recognizes diversity in student backgrounds, individual learning styles, and varying abilities. It is the responsibility of the school community to provide a positive learning environment fostered through mutual respect and dignity.

NCAHS Goals

1. Develop student understanding and appreciation for agriculture, natural resources, and the environment. Involve students in environmental issues at the campus and community levels and create an awareness of career opportunities in agriculture and related fields.

2. Provide guidance to all students concerning their academic and agricultural advancement as well as services to address social and personal needs. Such services will recognize the individual needs of all students.
3. Recognize students' achievements in all areas, thereby developing self-respect and pride by encouraging higher levels of performance.
4. Provide diverse clubs and activities designed to positively influence the students' physical, social, and emotional well being.
5. Provide a positive, safe and orderly environment that promotes active learning and the development of strong communication skills.
6. Provide positive and challenging work-based learning experiences through strengthened relationships with business partners and community employers.
7. Integrate academic and vocational curricula to maximize learning by fostering collaboration and communication among and between departments.
8. Develop and maintain funding sources, both public and private, to provide the necessary resources used in educating students.
9. Encourage the Alumni Association to collect data from graduates regarding their personal and professional successes.
10. Ensure the school philosophy is represented in all communications to prospective and current students and their parents as well as the community at large. School Council should develop a process to review the school philosophy and goals annually.

PROMOTION/GRADUATION POLICIES

Promotion Policy: In order to be promoted to the next grade, students must pass all required academic and vocational courses and earn the credits indicated in the chart below:

Total Credits:

Grade	Academic Credits	Vocational Credits
9	10.5	6.75
10	10.5	7.5
11	9.0	10.5
12	9.0	10.5

A student who does not earn the required credits is not eligible for promotion. Students who fail required academic courses must attend summer school. (Please refer to the *Summer School Policy* in the Student Handbook.)

Graduation Policy: Requirements for graduation from NCAHS are based upon the successful completion of required courses and minimum credit requirements for each year, and the accumulation of credits over four years:

Minimum Academic Requirements:	Minimum Vocational Requirements:
Four (4) years of English	Grade 9 – 6.75 credits
Four (4) year of Mathematics	Grade 10 – 7.5 credits
Three (3) Years of Social Studies	Grade 11 – 10.5 credits
Three (3) Years of Science (one must be Biology)	Grade 12 – 10.5 credits
Four (4) Years of Physical Education/Fitness	

Seniors Please Note: All seniors must take a minimum of 9 academic credits and pass 9.0 credits. Seniors must also pass 7 of 8 vocational courses in order to be eligible for a diploma and participate in the graduation ceremony and commencement exercises.

Students can also earn an additional four credits during their junior and senior year if they qualify, enroll and successfully complete CO-OP placement.

College Admissions: Students who wish to enroll at state colleges and universities must complete sixteen (16) Carnegie units of prescribed college preparatory courses. These do not include most of the vocational courses at NCAHS.

Norfolk County Agricultural High School

Norfolk County Agricultural High School graduates may meet the Board of Higher Education Admissions requirements by completing:

- 4 years of English
- 4 Years of Mathematics
- 4 years of Science
- 4 years of Social Studies

MANDATED STATE TESTING PROGRAMS

NCAHS participates with all other public schools in the Commonwealth of Massachusetts in the state testing program required by the Education Reform Act of 1993. As a result, all students in grade 9 and 10 will be required to take the state (MCAS) test. No students, including students with special needs, will be excused or exempted from taking this test.

Test items will be based on the curriculum standards identified in the Massachusetts Curriculum Frameworks. The content areas to be tested are: English/Language Arts, Mathematics, Science and Technology, and History and Social Science. As of this time, students must pass the English Language Arts, Mathematics, and Science and Technology tests in order to be eligible for graduation.

Students will have multiple opportunities to pass the tests, and Educational Proficiency Plans will be developed to identify needed areas/plans for remediation.

GRADING POLICIES:

School Terms/Semesters: The school year is divided into four marking periods (terms) and into two semesters. Courses may be a semester in length (2 terms) or year long (4 terms).

Failed Courses: Students who fail any required academic subject must successfully make up the failed course(s) or their promotion or graduation status will be jeopardized. Local summer schools are available for this purpose. Students receiving a D in any required course are encouraged to repeat this course in summer school before continuing their program of studies.

NCAHS Summer School Policy: To be eligible to make-up a course at summer school, the student must have received a minimum grade of 50 in the failed course. Only the Principal has the authority to overrule summer school eligibility decisions.

To receive NCAHS credit for summer school course completion, the student must earn a minimum grade of 70 (or C-) in any course which is made up. A course taken during the summer to improve a passing grade or for enrichment will not receive credit, but will be recorded on the student's transcript. Such a course shall not count in class rank or the student's G.P.A.

Any questions regarding summer school should be directed to the NCAHS Guidance Office.

OVERVIEW OF FOUR YEARS AT NCAHS

GRADE 9

All 9th grade students are required to take the four academic courses. Each student takes a full year of English, mathematics, science and social studies.

- To begin their preparation for careers in vocational agriculture, every 9th grade student will also participate in courses that will introduce them to four essential strands of Agricultural Science. As a freshman, each student will complete a full-year exploratory in Diesel and Mechanical Technology, Animal and Marine Science, Horticulture, and Environmental Science. Although these first-year courses are introductory in nature, they include the knowledge and skills that will provide a foundation for all vocational programs.

THE 9TH GRADE PROGRAM

ACADEMICS

English
Algebra I
Biology
World History II

VOCATIONAL

Intro to Animal Science
Intro to Horticulture
Intro to Environmental Science
Intro to Mechanical Technology
Introduction to Wellness I
Physical Education
Introduction to Careers and Technology I

GRADE 10

All 10th grade students are required to take the four academic courses. Each student takes a full year of English, mathematics, science and social studies.

Continuing the vocational agricultural exploratory program, students are offered a cluster of courses that allow them to begin to focus on particular areas of occupational interest. Each cluster contains required courses that provide specific experiences in one of the following four areas: Animal and Marine Science, Diesel and Mechanical Technology, Horticulture or Environmental Science. In addition, students choose two elective courses outside of their specific area of interest to support a continued exploratory experience.

THE 10TH GRADE PROGRAM

ACADEMICS

English
Geometry
Chemistry
United States History I

In addition, all students are required to take:

Introduction to Wellness II
Physical Education
Introduction to Careers and Technology II

VOCATIONAL

Animal & Marine Science:

Required Courses: Canine, Feline and Veterinary Science
Farm Management and Equine Science
Small Animal and Marine Science
Herpetology and Avian Science

Diesel & Mechanical Technology:

Required Courses: Woodworking
Equipment Operations
Small Engine Power
Welding

Horticulture:

Required Courses: Introduction to Urban Forestry/Arboriculture
Horticulture
Landscape Operations
Floriculture

Environmental Science:

Required Courses: Natural Resources and the Environment
Forestry
Climate Change
Energy and the Environment

All students will be required to take four required courses in one area, plus two electives from the other departments' course offerings..

GRADE 11

Grade 11 students continue in an academic program designed to meet graduation requirements and individual college or career goals. Each NCAHS student elects a vocational major. Within each of the vocational program majors, NCAHS students also choose a specific concentration. Compatible with career preparation, 11th grade students who meet eligibility requirements may elect to participate in an approved Cooperative Education Program (CO-OP) during the fourth marking term. CO-OP applicants must meet all criteria.

THE 11TH GRADE PROGRAM

ACADEMICS

English
Algebra II or Precalculus
US History II
Science (Physics or Earth Science)

VOCATIONAL CLASSES

Each student takes vocational agriculture courses aligned with selected majors and concentrations, in addition to:

Fitness and Wellness for Life I
Career and Technology III

GRADE 12

For seniors, vocational courses and lab work are focused on program majors and concentrations.

A second year of CO-Operative Education (CO-OP) is offered to eligible seniors in the fourth marking term. CO-OP applicants must meet all criteria.

THE 12TH GRADE PROGRAM

ACADEMIC COURSES

English
Math
Science (Elective)
Social Studies (Elective)

VOCATIONAL CLASSES

Each student takes vocational agriculture courses aligned with selected majors and concentrations in addition to:

Fitness and Wellness for Life II
Career and Technology IV

THE ACADEMIC PROGRAM

Description of Levels

Honors

This is the highest level of classes offered at Norfolk Aggie. This level is designed for our most Academically motivated and talented students who are above grade level. Exceptional work ethic, study and organization skills are the benchmarks for honors-level. Students in this level are expected to complete rigorous independent projects and readings. Requirements for entrance to this level are based on grades and teacher recommendations. We believe that teachers are the best judges of our students' likelihood for success.

College Prep (CP) Level 1

This is the highest level of classes offered at Norfolk Aggie. This level is designed for students who are at or above grade level, and who demonstrate exceptional work ethic, study and organization skills. Students in this level are expected to complete challenging independent projects and readings. Requirements for entrance to this level are based on grades and teacher recommendations. We believe that teachers are the best judges of our students' likelihood for success.

College Prep (CP) Level 2

This level is designed for students whose academic skills are at grade level. Students will be held to high standards for learning and academic performance and will be supported by teachers and others to learn at high levels. It is anticipated that all students who are successful in level 2 classes will compete well in college admissions.

Courses that Potentially Lead to AP Examination

The school offers several courses that potentially lead to the Advanced Placement Examination. These courses are weighted as honors courses with the goal that students participate in the Advanced Placement Examination in May. If a student scores a 3, 4 or 5 on the exam, he/she can request college credit for a similar course at the college he/she will be attending. These courses are: Brain and Behavior, Calculus and Environmental Science Program.

Limited Parental Override Procedure

Academic subject area classes are available in Level 1 and Level 2. Students will be recommended for a specific course at a specific level by their current teachers based on their performance in class. All levels are college prep classes. Level 1 classes are designed for students who are at or above grade level, have high grades, possess an excellent work ethic, enjoy learning at a rigorous pace and are self-motivated. These classes frequently require outside readings, research papers and/or other additional assignments and obligations.

Level 2 classes are for students who are at or near grade level in reading, writing and math. At this level, students are presented with specific strategies and concepts designed to enhance their knowledge in key areas to better prepare them for anything they choose beyond high school, including college level academic work.

Parents who would like to override the level recommendation made by a teacher will be required to complete the Limited Parental Override form, which is available on our website (Forms and Resources).

THE ENGLISH PROGRAM

(1110) Freshman English (Grade 9) – CP Level 1

This literature based course is designed to study the four genres of literature: fiction, nonfiction, drama and poetry. In addition, there will be extensive vocabulary and grammar study. Students taking this course should be reading at or above grade level. Instruction is designed to encourage critical reading and thinking, with assignments that are challenging and lengthy. Oral and written English responses are a regular component of this course. Completion of a research paper is a requirement in the freshman year.

(1120) Freshman English (Grade 9) – CP Level 2

This literature based course is designed to study the four genres of literature: fiction, nonfiction, drama, and poetry. Students taking this course should be reading at grade level. Instruction is designed to develop techniques for reading and writing more effectively, and to develop proficiency in vocabulary and grammar study. Completion of a research paper is a requirement in the freshman year.

(1260) Honors Sophomore English (Grade 10) - H

This course is for college-bound students and requires more rigorous reading and writing projects. It aligns with the English 10 curriculum, is supplemented with additional informational and literary texts, and includes more outside of school reading. Students are expected to perform writing tasks with a higher level of critical thinking, depth, and detail. This course focuses on in-depth, high level reading of novels, poetry, and plays. Students practice writing cogent, open-ended essays on various topics from literature. Students are expected to complete a significant amount of independent work including projects.

Prerequisite: Successful completion of Freshman English 1110 AND Teacher recommendation

(1210) Sophomore English (Grade 10) – CP Level 1

This literature based course continues Grade 9 skill development with a more focused emphasis on analyzing literature and improving essay writing. Students taking this course should be reading at or above grade level. Instruction is designed to help students develop, practice and refine their reading, writing, speaking and critical thinking skills. Reading and writing assignments can at times be lengthy and challenging and will require literary analysis. Oral and written responses are a regular component of this course. Formal papers will be assigned.

Prerequisite: Students must have earned an 85 or better in Freshman English and teacher recommendation.

(1220) Sophomore English (Grade 10) - CP Level 2

This literature based course continues the skill development emphasized in Grade 9. Students taking this course should be reading at grade level. Instruction is designed to help students develop, practice and refine their reading, writing, listening, speaking and critical thinking skills. Oral and written responses are a regular component of this course, as are vocabulary development and grammar study.

(1365) Honors American Literature (Grade 11) - H

This literature-based course examines common themes in American literature through the in-depth study of classical and contemporary works. It is a focused study on the literary merit, impact, and historical significance of a diverse range of American authors. Students taking this course should be reading above grade level and enjoy challenging, complex reading. Instruction is designed to hone critical reading, analytical writing, and effective speaking and listening skills. Reading and writing assignments are lengthy and complex, requiring in-depth analysis, extended focus, a strong work ethic, and an ability to work independently. Oral and written responses and extensive vocabulary and literary term study are a regular component of the class.

Prerequisite: Successful completion of Sophomore English 1210 or Honors Sophomore English AND Teacher recommendation

(1315) American Literature (Grade 11) – CP Level 1

This literature based course examines common themes in American literature through the study of classical and contemporary works. It is a focused study on the literary merit, impact, and historical significance of some of the greatest American authors. Students taking this course should be reading at or above grade level. Instruction is designed to strengthen critical reading, analytical writing, note-taking, and effective speaking and listening skills. Reading and writing assignments are lengthy and challenging and will require in-depth analysis. Oral and written responses and extensive vocabulary and literary term study are a regular component of the class. PSAT/SAT preparation is included as part of the curriculum.

Prerequisite: Students must have earned an 85 or better in Sophomore English and teacher recommendation.

(1321) American Literature (Grade 11) – CP Level 2

This literature based course examines common themes in American literature through the study of classical and contemporary works. It is a focused study on the literary merit, impact, and historical significance of some of the greatest American authors. Students taking this course should be reading at grade level. Instruction is designed to strengthen reading, essay writing, note-taking, and speaking and listening skills. Reading and writing assignments, and vocabulary and literary study are a regular component of the class. PSAT/SAT preparation is included as part of the curriculum.

(1465) Honors Major Literary Works (Grade 12) - H

This literature-based course focuses on the study of major literary works, both classic and contemporary. Through analyzing literature, students will develop and refine reading, writing, speaking, and listening skills. Throughout the year, we will explore literature that has had a profound impact on a worldwide audience. Students will delve into each text to consider how culture and setting act as a vehicle to understanding the human condition in a variety of contexts. Writing assignments and projects will prompt reflection on an author's perspective and purpose or make arguments of your own in connection with the novel or drama. Writing assignments are designed to promote composition and critical thinking skills in preparation for college-level courses.

Prerequisite: Successful completion of American Literature 1315 or Honors American Literature AND Teacher recommendation

(1415) Major Literary Works (Grade 12) – CP Level 1

This world literature course focuses on the study of major works by classical and contemporary authors. It is a focused study on the literary merit, impact, and cultural and historical significance of some of the world's greatest works. Students taking this course should be reading above grade level. Reading and writing assignments are challenging and lengthy. There will be extensive research and analysis required in each writing assignment. Oral and written responses and extensive vocabulary and literary term study are a regular component of the class.

Prerequisite: Students must have earned an 85 or better in American Literature and teacher recommendation.

(1420) Major Literary Works (Grade 12) – CP Level 2

This course is focused on the study of major literary works, both classical and contemporary. Through analyzing literature, students will develop and refine their reading, writing, speaking, and listening skills. Instruction is designed to promote an understanding of literary criticism and historical and cultural influences through critical thinking and analytical writing activities. Reading assignments will be challenging and lengthy with an emphasis on vocabulary and literary term study. Writing assignments are designed to promote composition skills in preparation for post-secondary education.

(1425) Creative Writing and Composition (Grade 12) -- CP Level 2

Do you like to be creative? Do you like to invent or tell stories or experiment with words and ideas? Do you like to read or write as a hobby? If so, creative writing is for you! We'll write poems, short stories and flash fiction and have fun with creative exercises. We'll create a bond with fellow writers and enjoy each other's work, giving feedback and encouragement. To top it off, we'll make an online literary magazine to show off your talent. Instructional methods include the use of journals and writer's notebooks, peer editing, literary style analysis, readings on writing, and working with peers, in small and large groups. The college essay will be a component of the fall semester.

(1430) Critical Reading and Writing for Professional Communication

This course is designed as an alternative pathway to Major Literary Works and focuses on the study and practice of communication skills required of those pursuing professions right out of high school. While the course will focus more on nonfiction, informational and industry-based literature, it will also intertwine some major literary works, both classical and contemporary. Through research, analyzing digital sources, and relying on information from their own vocational majors, students will develop and refine the reading, writing, speaking, and listening skills that are required of their professional pursuits.

THE MATHEMATICS PROGRAM

(2161) Algebra 1 Honors

This course is the first in a three-year sequence of courses that prepares students for advanced mathematics in their senior year. Instructional time will focus on the following critical areas: deepening and extending understanding of linear and exponential relationships; solving systems of linear equations and inequalities; contrasting linear and exponential relationships with each other and engaging in methods for analyzing, solving, and using quadratic functions; applying linear models to data that exhibit a linear trend. Given time, additional concepts will be explored in greater depth and extended to include the study of topics such as matrices, multi-variable and non-linear systems of equations, complex numbers, radical equations, and inverse functions. Students are required to have a TI-84 graphing calculator. *Level placement for this course will be based upon each student's score on the placement exam, 8th grade teacher recommendation and department consensus.*

(2110) Algebra I (Grade 9) – CP Level 1

This course provides a realistic context for the symbols of algebra focusing on the use of algebra as a problem solving tool in our daily lives. Algebra will be linked to other disciplines such as art, biology, geography, history, music and business to expand students' sense of the usefulness of algebra. Students are required to have a TI-84 graphing calculator.

Level placement for this course will be based upon each student's score on the placement exam and 8th grade teacher recommendation.

(2120) Algebra I (Grade 9) – CP Level 2

This course demonstrates the usefulness and vitality of algebra, making it accessible to every student. Real life applications help students see the relevance of algebra to their own lives. This course emphasizes and integrates problem solving, critical thinking, communication, and connections. Students are required to have a TI-84 graphing calculator.

Level placement for this course will be based upon each student's score on the placement exam and 8th grade teacher recommendation.

(2265) Honors Geometry (Grade 10)

This course is the second in a three-year sequence of courses that prepares students for advanced math in their senior year. Honors Geometry develops topics from Euclidean Geometry. Topics studied include parallel and perpendicular lines, congruent triangles, similarity, right triangles and trigonometry, quadrilaterals, polygons, transformations, circles, measurement of figures and solids, and statistics and probability. A major emphasis is placed on the development of critical thinking skills, both inductive (geometric pattern recognition) and deductive (formal proofs), and selected rules of inference used in the development of geometry as an axiomatic system. Students are required to have, at a minimum, TI-84 graphing calculator. *Level placement for this course will be based upon department recommendations, teacher recommendation and department consensus.*

(2210) Geometry (Grade 10) – CP Level 1

This course includes all traditional geometry topics and trigonometry from a geometry perspective. Abstract geometry concepts are related to algebra concepts and connected to real world applications. The course stresses inductive reasoning, interdisciplinary activities, hands-on materials and technology. Students are required to have a TI-84 graphing calculator.

Prerequisite: Students must have completed (2115) Algebra 2 and must meet eligibility requirements (see above) to take level 1 courses.

(2220) Geometry (Grade 10) – CP Level 2

This course includes all traditional geometry topics and uses an informal approach. An emphasis is placed on hands-on projects, and real world applications. This course emphasizes and integrates problem solving, critical thinking, communication, and connections. Students are required to have a TI-84 graphing calculator.

(2230) Algebra / Geometry I - CP Level 2

This course develops an understanding of basic algebra and geometry concepts. Course objectives are chosen and paced to meet individual student needs. Practice with multiple-choice, short-answer, and open-ended questions reinforce and maintain test-taking skills. Real-life application projects emphasize problem-solving, critical thinking, communication, and connections. Students are required to have a scientific calculator for use at school and at home. *Prerequisite(s): teacher recommendation.*

(2301) Pre-Calculus (Grade 11) – CP Level 1

Pre-Calculus offers students continued development of algebra and trigonometry concepts, as well as strong preparation for calculus. This course emphasizes the prerequisites for calculus using a visual approach including graphing calculators. Students are required to have a TI-84 graphing calculator.

Prerequisite(s): Students must meet eligibility requirements (see above) to take level 1 courses

(2310) Algebra II (Grade 11) – CP Level 1

This course continues the study of algebra as a problem solving tool including a review of polynomials, operations, graphing and equations. The course then progresses to linear, polynomial and rational functions. Emphasis is placed on continued development of algebraic skills and their relationship to the real world. Students are required to have a TI-84 graphing calculator. *Prerequisite(s): Students must meet eligibility requirements (see above) to take level 1 courses*

(2320) Algebra II (Grade 11) – CP Level 2

This course continues the study of algebra as a problem solving tool. Topics include the real number system, polynomials, operations, graphing, equations and inequalities. Emphasis is placed upon algebra skills and their relationship to the real world. Students are required to have a TI-84 graphing calculator.

(2361) Algebra II Honors

This course is the third in a three-year sequence of courses that prepared students for advanced math in their senior year. Algebra II Honors continues the study of algebra as a problem solving tool including a review of polynomials, operations, graphing and equations. The course then progresses to additional concepts including the study of matrices, multi-variable and non-linear systems of equations, complex numbers, radical equations, and inverse functions. Given time the course will explore conics, sequence and series, probability and statistics and trigonometry. Emphasis is placed on continued development of algebraic skills and their relationship to the real world. Students are required to have a *TI-84* graphing calculator. *Level placement for this course will be based upon department recommendations.*

(2365) Pre-Calculus Honors (Grade 11)

Pre-Calculus offers students continued development of algebra and trigonometry concepts, as well as strong preparation for calculus. This course emphasizes the prerequisites for calculus using a visual approach including graphing calculators. Students are required to have a *TI-84* graphing calculator. *Level placement for this course will be based upon department recommendations.*

(2401) Pre-Calculus (Grade 12) – CP Level 1

Pre-Calculus offers students continued development of algebra and trigonometry concepts, as well as strong preparation for calculus. This course emphasizes the prerequisites for calculus using a visual approach including graphing calculators. Students are required to have a *TI-84* graphing calculator.

Prerequisite(s): Students must have completed (2205) Geometry and meet eligibility requirements (see above) to take level 1 courses.

(2405) Calculus (Grade 12) – CP Level 1 (potentially leads to AP Exam)

The course will cover the topics of limits, methods of differentiation and applications of the derivative, integration techniques and applications of the integral. Real-life applications are used to show students how calculus is applied to solve problems in biology, chemistry, economics, physics, business, and psychology. Students are required to have a *TI-84* graphing calculator.

Prerequisite(s): Students must have completed (2301) Pre-Calculus and meet eligibility requirements (see above) to take level 1 courses.

(2419) Statistics - (Grade 12) -- CP Level 1

Statistics is a year long course designed to introduce the concepts and methods used in the field of applied statistics. This course acquaints students with the tools for collecting, analyzing, drawing conclusions, and making predictions from data. The course will be both project and assessment based involving the hands-on gathering and analysis of real world data. Ideas and computations presented in this course have immediate links and connections to actual events and applications to vocational fields. The use of computers and calculators will allow students to focus deeply on the concepts involved in applied statistics. The course will culminate with a capstone project related to the individual student's vocational interest.

Prerequisite(s): Students must meet eligibility requirements (see above) to take level 1 courses

(2425) Introduction to College Algebra (Grade 12) – CP Level 2

Opening with an SAT review, this course provides an introduction to college level algebra, beginning with factoring and continuing on with rational expressions, functions, and systems of equations, It is required that students have a *TI-84* graphing calculator for this course.

(2436) Financial Algebra - (Grade 12) -- CP Level 2

This course is a unique blend of math concepts that will prepare students for post-secondary career or college level math. This course will focus on contemporary, daily and career uses of mathematics that will add to student mastery of algebra and geometry; and will also reinforce skills in arithmetic operations and

numeracy. Students will be taught basic accounting principles and financial skills for independent life and business. It is required that students have a *TI-84 Plus* graphing calculator for this course.

THE SCIENCE PROGRAM

(3111) Biology I (Grade 9) - CP Level 1

This course focuses on the study of life by first examining the chemistry of life and building upon those concepts to examine the structure and function of cells. The course transitions to the macro world by examining anatomy and physiology, evolution, and ecology. The emphasis will be placed on critical thinking skills, inquiry, and in depth analysis of the content.

(3121) Biology I (Grade 9) - CP Level 2

This course focuses on the study of life by first examining the chemistry of life and building upon those concepts to examine the structure and function of cells. The course transitions to the macro world by examining anatomy and physiology, evolution, and ecology. The scientific process and laboratory skills are emphasized along with biology's connections to the "real world." Students learn scientific writing skills and also examine current biological issues.

(3261) Honors Chemistry (Grade 10)-H

This laboratory-based course is rapidly paced and in-depth study of the principles of chemistry. Course topics include atomic structure, stoichiometry, chemical reactions, kinetic theory, states of matter, thermochemistry, periodicity, bonding, kinetics, equilibrium, and acids/bases. Emphasis is placed upon the quantitative aspects of chemical principles. Laboratory work is an integral part of the course, and comprehensive lab reports are required. Students are expected to have a strong mathematics background, excellent reading skills, exceptional study habits, ability to work both independently and cooperatively in small groups, ability to combine multiple abstract concepts.

Prerequisites: Admission to the course depends on previous performance in science, facility with mathematical skills, a demonstrated readiness to engage in abstract/independent problem solving, and teacher recommendation.

(3211) Chemistry (Grade 10) - CP Level 1

This course incorporates concepts and terminology with lab skills in order to introduce basic chemistry concepts. This course is an inquiry based course that requires students to use qualitative and quantitative observations to analyze data, perform experiments, and to illustrate the results of their experiments. Topics expected to be covered include: lab safety, measurement, atomic structure, bonding, chemical periodicity, chemical reactions, stoichiometry, kinetics, equilibrium, and acid base chemistry. Students in this course must be capable of mathematical problem-solving. Use of a calculator is strongly encouraged. The emphasis will be placed on critical thinking skills, inquiry, and in depth analysis of the content.

Prerequisites: Admission to the course depends on previous performance in science, and 85 average in Freshman Biology, facility with mathematical skills, a demonstrated readiness to engage in abstract/independent problem solving, and teacher recommendation.

(3221) Chemistry (Grade 10) - CP Level 2

This course incorporates concepts and terminology with lab skills in order to introduce basic chemistry concepts. This course is an inquiry based course that requires students to use qualitative and quantitative observations to analyze data, perform experiments, and to illustrate the results of their experiments. Topics expected to be covered include: lab safety, measurement, atomic structure, bonding, chemical periodicity, chemical reactions, stoichiometry, kinetics, equilibrium, and acid base chemistry. Students in this course must be capable of mathematical problem-solving. Use of a calculator is strongly encouraged. The scientific process and laboratory skills are emphasized along with chemistry's connections to the "real world." Students learn scientific writing skills and also examine current issues.

(3361) Honors Physics (Grade 11)-H

This laboratory based course will allow students to focus on physical phenomena and derive theories from this data. The topics of investigation will include motion, momentum, energy, waves, force, gravity, sound, light, optics, electricity, circuitry and magnetism at a faster pace than a CP1 course. The course will include review and application of many concepts introduced in algebra II and precalculus, and using critical thinking to solve problems, complete unit based projects, and content based research.

Prerequisites: Admission to the course depends on previous performance in science, facility with mathematical skills, a demonstrated readiness to engage in abstract/independent problem solving, and teacher recommendation.

(3311) Physics (Grade 11) - CP Level 1

This lab based course will allow students to focus on physical phenomena and derive theories from this data. The topics of investigation will include motion, momentum, energy, waves, force, sound, light, electricity and magnetism. The course will include review and application of many concepts introduced in mathematics, and using critical thinking to solve problems and finish projects.

Prerequisite(s): Students must meet eligibility requirements (see above) to take level 1 courses

(3321) Physics (Grades 11) - CP Level 2

This lab based course allows students to focus on physical phenomena and derive theories from this data. The topics of investigation will include motion, momentum, energy, waves, force, sound and light. The course will make and use connections with mathematics to help explain theories and phenomena observed in everyday life.

(3322) Earth Science (Grade 11) - CP Level 2

In this course, students will utilize scientific practices to discover knowledge and overarching concepts related to Earth and space science. Students will recognize unifying themes that integrate the major topics of Earth and space science including Earth and its place in the universe, the solar system, plate tectonics, and physical geology. The curriculum integrates critical thinking and laboratory skills that stress the development of experimental design, detailed observation, accurate recording, data interpretation, and analysis. This course is a project and lab based course designed to provide students with an alternative lab based course that satisfies the science requirement during junior year.

(3415) Human Anatomy and Physiology (Grade 12) - CP Level 1

This course covers the external and internal structures of the human body and the physical relationships among body parts. Each of the major body systems will be covered in detail as well as their relevance in the human body as a unit. This course is designed to prepare students for college courses in the medical or health field, as well as those students simply interested in the anatomy and physiology of the human body. Dissection is a required aspect of this course.

Prerequisite(s): Students must meet eligibility requirements (see above) to take level 1 courses

(3418) Forensic Science (Grade 12)

Forensic science is the application and use of basic biological, chemical, and physical science principles to solve problems. Students will assume the roles of crime scene investigator, scientists and medical investigators in order to collect and evaluate data in an inquiry/problem solving environment. Students will also learn and apply state and federal law regarding evidence collection, handling, and analysis in the study of criminal and civil issues. Major themes in this course are ballistics, toxicology, entomology, evidence law, DNA, anthropology, criminalistics, and forensic psychiatry/psychology. Students use mathematical equations and theories to back up evidence; such as trigonometry for direction of blood splatter and half-life equations for carbon dating of skeletal remains. Therefore, students in level 1 forensic science should be in a level 1 math class.

(3425) Brain and Behavior (Grade 12)

This course is about the biology of the brain. How are signals transmitted in the brain? How do neurons create memories and how do we learn? How does a teenage brain lead to certain behaviors? How does the brain control complex behaviors? What effect do concussions and drugs have on the brain? To answer these questions, students will read varied texts, carry out lab activities, participate in class discussions, and complete projects. Students will be able to apply topics to their own lives through studies in mindfulness, depression, anxiety, and mental illness; all in terms of brain function. This course will include a mammalian brain dissection. Students have the opportunity to take the AP Psychology exam in May.

(3431) Engineering Design (Grade 12)

This course will give students a basic understanding of the different fields of engineering and robotics careers with the hope of inspiring a broader avenue of major's for seniors looking towards college. Focusing on the areas of Civil, Mechanical, Aeronautical, and Electrical Engineering, Materials Sciences, CAD, and Robotics. Students will move towards more open-ended critical thinking skills when there is no single right answer through a project based application of solving problems.

THE SOCIAL STUDIES PROGRAM

(4111) World History II Grade 9 - CP Level 1

This course provides a thematic study of the world from the 16th Century to the Modern World. An emphasis will be placed on an independent research project on a historical/social event that the instructor will detail throughout the year. The focus of this course will include but not be limited to The Age of Revolutions, World Conflicts, Imperialism, Reform Movements, Government Ideologies and Modern World Religions. Additional emphasis will be placed on essay writing and critical reading, writing, and thinking skills. Multimedia research projects, presentations, classroom debates, and analytical readings will be utilized.

(4121) World History II (Grade 9) - CP Level 2

This course involves a thematic study of the world from the 16th Century to the Modern World. The focus of this course will include but not be limited to The Age of Revolutions, World Conflicts, Imperialism, Reform Movements, Government Ideologies and Modern World Religions. Additional emphasis will be placed on essay writing, critical reading, writing and thinking skills, and on study and organizational skills.

(4261) United States History I Honors(Grade 10)- H

Prerequisite(s): Students must have earned a 90 or better in Freshman history and teacher recommendation. Students must complete writing prompt to be considered.

This course presents a thematic examination of the people, places, and events that helped shape the history of the United States from The American Revolution to the end of the First World War. At least once a semester, students will complete document-based essay questions (DBQ) that pertain to the respective curriculum. The focus of the course will include but not be limited to the Origins of the Revolution and the Constitution, Democratization and expansion, economic growth in the North, South, and West, Social, political, and religious change, the Civil War and Reconstruction, Rebuilding the United States: immigration and industry, and Progressivism and World War I. Students will complete various assignments researching and analyzing primary and secondary sources that pertain to these units and will be expected to complete readings at home to participate in class activities.

(4211) United States History I (Grade 10) - CP Level 1

Prerequisite(s): Students must have earned an 85 or better in Freshman history and teacher recommendation.

This course presents a chronological examination of the people, places, and events that helped shape the history of the United States from colonial times to reconstruction. An emphasis will be placed on an independent research project on a historical/social event that the instructor will detail throughout the course of the year. Students will complete an outside reading assignment during the course of the school year. The focus of the course will include but not be limited to Colonialism, The Revolutionary War, The Founding Documents (including The Declaration of Independence, Articles of Confederation, Federalist Paper Number 10, The Constitution and Bill of Rights), The Branches of Government (State and Federal Levels), Nationalism and Sectionalism, Westward Expansion and Manifest Destiny, and the Civil War and Reconstruction.

(4221) United States History I (Grade 10) - CP Level 2

This course presents a chronological examination of the people, places, and events that helped shape the history of the United States from colonial times to reconstruction. An emphasis will be placed on an independent research project on a historical/social event that the instructor will detail throughout the course of the year. The focus of the course will include but not be limited to Colonialism, The Revolutionary War, The Founding Documents (including The Declaration of Independence, Articles of Confederation, Federalist Paper Number 10, The Constitution and Bill of Rights), The Branches of Government (State and Federal Levels), Nationalism and Sectionalism, Westward Expansion and Manifest Destiny, and the Civil War and Reconstruction. Additional emphasis will be placed on study and organizational skills, essay writing and critical reading, writing, and thinking skills. The method may include and not be limited to multimedia research projects and presentations, classroom debates, and analytical readings.

(4361) United States History II 20th Century Honors (Grade 11)-H

Prerequisite(s): Students must have earned a 90 or better in Sophomore history and teacher recommendation. Students must complete writing prompt to be considered.

This course presents a thematic study of social, historical, political, and economic events from the 1920s to the present day. An emphasis will be placed on an independent research project on a historical/social event that the instructor will detail throughout the course of the year. As an honors course, students will be required to complete extensive outside research and will be expected to complete readings at home and contribute to in class discussion and activities, as well as practice and refine critical-analytical and research skills in a multitude of formats.

(4311) United States History II 20th Century (Grade 11) CP Level 1

Prerequisite(s): Students must have earned an 85 or better in Sophomore history and teacher recommendation.

This course presents a chronological examination of the social and historical events from the Industrial Age to the Modern Times. An emphasis will be placed on an independent research project on a historical/social event that the instructor will detail throughout the course of the year. Students will be required to complete two outside readings. The focus of the course will include but not be limited to Immigration and Industrialization, Progressivism, Imperialism, The First World War, Prohibition and the 1920's, The Great Depression and New Deal, The Second World War, The Origins of the Cold War (The United States at Home and Abroad), The Civil Rights Movement, Kennedy's New Frontier and Johnson's Great Society, The Vietnam Era, The Thaw of the Cold War, and Modern Times.

(4321) United States History II 20th Century (Grade 11) CP Level 2

This course presents a chronological examination of the social and historical events from the Industrial Age to the Modern Times. Students will be required to complete one outside reading. The focus of the course will include but not be limited to Immigration and Industrialization, Progressivism, Imperialism, The First World War, Prohibition and the 1920's, The Great Depression and New Deal, The Second World War, The Origins of the Cold War (The United States at Home and Abroad), The Civil Rights Movement, Kennedy's New Frontier and Johnson's Great Society, The Vietnam Era, The Thaw of the Cold War, and Modern Times.

(4412) Genocide in the Modern World (Grade 12)

This course presents a chronological study of genocide in the 20th century. Teachers will emphasize the causes and effects the genocide had on the local population. Students will learn about the ladder of hate and what causes genocide to happen. Topics of study will be Armenian, Nazi Germany, Cambodia, Rwanda and Social Psychology (to help answer the question of why). Class discussion will be emphasized along with critical thinking in order to prepare students for college. Students will be required to complete at least one outside reading and one independent research project on an event that the instructor will emphasize throughout the course of the year, and a comprehensive final will be given at the end of the year.

(4423) Eyes on American Culture/American Cinema in History (Gr. 12)

This course will introduce students to a unique way of studying and learning about history from an American and Global perspective. The focus, study, and analysis throughout the class will be centered on modern-day filmmaking. Students will learn and experience film as an engine for an artifact of society, culture, history, and geography. Students will study important moments in history by analyzing and interpreting major motion pictures. This course will facilitate student learning by teaching critical thinking skills, writing and communication skills, historical significance, collaborative work projects, literary appreciation, and understanding of how films/major motion pictures represent American culture.

(4424) US Government and Civics

This course provides a framework for understanding the United States government and the rights and responsibilities of citizens as established by the US Constitution. Through an interdisciplinary and project based approach, students will study the historical underpinnings of the US government, as well as its practical applications in current events. Students are expected to understand their rights and responsibilities as citizens and how to exercise these rights and responsibilities in local, state, and national government.

STUDENT SUPPORT PROGRAMS

(GLC1) GENERAL LEARNING CENTER (Pass/Fail)

The General Learning Center is designed for general education students to receive instruction in organization, study skills, note taking, test preparation, time management, and other necessary executive functioning skills. Students will learn strategies that can be applied to the work they are doing in content areas across their vocational and academic subjects. GLC meets two (2) times per week and is not intended to be a course taken over multiple years at school, but rather one that provides students with targeted interventions that are learned and then applied on their own once mastered. Enrollment in this course is based on the recommendation of the student's guidance counselor.

Periods per week: 2 Semester Credits: .75 Level: P-F

(6334) ACADEMIC SKILLS (Pass/Fail)

Academic Strategies course is designed for students on IEPs (Individualized Education Program) to receive specially designed instruction in a small group setting during the school day. This course will address

varying goals in a student's IEP, as well as a variety of skills that students require to access the general education content. This may include the areas of study skills, organizational strategies, the writing process, self-advocacy or note-taking strategies. Services are provided two (2) times per week. Enrollment in this course is based on the recommendation of the student's Team.

Periods per week: 2 Full year Credits: 1.5 Level: P-F

THE WELLNESS AND PHYSICAL EDUCATION PROGRAM

NCAHS PE/Wellness department educates students to take a holistic approach to overall wellness. Lifestyle choices such as diet, fitness/exercise, stress management and relationships, are important topics that students will learn. The Wellness and Physical Education curriculum is the strongest content vehicle we have for teaching patterns of behavior which will enhance both the quantity and quality of life. All ninth and tenth grade students take Physical Education and one semester of Wellness. All 11th and 12th grade students take one semester of Fitness & Wellness.

(5000-Sem 1) (5001-Sem 2) Freshman Physical Education (Grade 9)

All students are required to have appropriate clothing and participate in Physical Education. The program offers each student experiences in a wide range of sport, fitness, dance and self-challenging activities for a lifetime of participation in physical activities. Personal fitness level assessment is attained through the use of various assessment methods.

(5115) Introduction to Wellness I (Grade 9)

This course is designed to provide students with up-to-date and accurate information to aid in refining personal decision-making skills. The major components of the program are followed by the Southcoast Hospital RAPP curriculum which includes all aspects of sexual reproduction health.

(5201-Sem 1) (5202-Sem 2) Sophomore Physical Education (Grade 10)

All students are required to have appropriate clothing and participate in Physical Education. The program offers each student experiences in a wide range of sport, fitness, dance and self-challenging activities for a lifetime of participation in physical activities. Personal fitness level assessment is attained through the use of various assessment methods.

(5215) Introduction to Wellness II (Grade 10)

This course continues the promotion of behaviors that enhances student's levels of wellness. The major components of this course are components of wellness, addiction, nutrition, alcohol & drug related topics, mental health, and healthy relationships.

(5335) Fitness and Wellness for Life I (Grade 11)

The goal of this course is to encourage students to sustain a healthy body and mind. All students are required to have appropriate clothing and participate in this class. The program offers each student experiences in a wide range of sport, fitness, dance and self-challenging activities for a lifetime of participation in physical activities. Personal fitness level assessment is attained through the use of various assessment methods. This class will also include a wellness component, emphasizing health enhancing behaviors throughout life.

(5435) Fitness and Wellness for Life II (Grade 12)

This course is designed to build on the goals outlined in the Fitness and Wellness for Life I and encourage students to sustain a healthy body and mind. All students are required to have appropriate clothing and participate in this class. The program offers each student experiences in a wide range of sport, fitness, dance and self-challenging activities for a lifetime of participation in physical activities. Personal fitness

level assessment is attained through the use of various assessment methods. This class will also include a wellness component, emphasizing health enhancing behaviors throughout life.

(5440) Adapted Physical Education

This physical education course is adapted or modified to address the individualized needs of students. Adaptations are made to ensure that each student will experience success in a safe environment, while making progress towards identified goals and objectives.

CAREER AND TECHNOLOGY PROGRAM

(6800) Introduction to Careers and Technology I (Grade 9) – CP Level 2

This course introduces freshmen to the agricultural education program at NCAHS through a series of activities designed to welcome them to the “Aggie” and prepare them for the demands of the high school academic and vocational technical curriculum. Students gain insight into their learning style, career interests and study skills. Goal setting workshops help students set higher expectations regarding personal success. Students begin to have a better understanding and appreciation of academics and the benefit of having a career plan. In addition, students learn to utilize a variety of software applications, receive an introduction to internet research and internet safety.

(6805) Introduction to Careers and Technology II (Grade 10) – CP Level 2

This sophomore course further develops a student’s career plan. Students learn about different majors offered, and begin to consider career and educational pathways. Oral presentations, public speaking and communication are a part of this class. This course also places a strong emphasis on the use of technology in research, web applications and an introduction to e-portfolios.

(9812) Career and Technology III (Grade 11) – CP Level 2

Students begin to prepare a personal employment credential file, which includes a resume, cover letter and reference list, in addition to preparing evidence of skill attainment. The course assists students in becoming familiar with applications for employment and college, and prepares them for the deadlines and the expectations that they face in the first semester of their senior year. Career research and college planning will be a focus of the work conducted in this course. Additional topics include customer service, budgeting, insurance and interview skills.

(9912) Career and Technology IV (Grade 12) – CP Level 2

This course is designed to provide seniors with the knowledge and skills necessary for a successful transition from high school to employment, post-secondary education or a combination of both. Students will update their resume, reference list. Focus will also be placed upon money management, insurance, acquiring loans and personal finances. Students will also explore elements of entrepreneurship, marketing and sales.

EARLY COLLEGE PROGRAM

Grades 11 and 12

The Early College Program offers eligible junior and senior students an opportunity to take college classes while in high school. These classes are taught by Massasoit professors and can be used for high school and/or college credit. Students must take and pass the Accuplacer exam prior to being admitted into the program. Interested students must meet with their Guidance Counselor to determine if they meet eligibility requirements.

Eligible students who enroll in the Early College program will take 4 college courses: Composition I

(junior year), Composition II (junior year), Psychology (senior year), and Statistics (senior year). If a student enrolls in the program, he/she must take all 4 courses. The courses are entirely online and the professor is remote. Students will be given a designated block on their schedule in lieu of another course to work on the college course.

These courses will count for their Junior and Senior English, Senior math and Senior history courses. Upon completion, students will have earned 12 college credits that could be transferable to most universities.

DUAL ENROLLMENT OPPORTUNITIES

Grades 11 and 12

The Dual Enrollment Program offers eligible junior and senior students an opportunity to enrich their NCAHS educational experience by taking college courses during high school. Students who wish to take advantage of the Dual Enrollment Program must meet with their Guidance Counsellor to determine if they meet the eligibility requirements.

Minimum eligibility requirements:

- a) Passing score on the MCAS
- b) Minimum grade point average
- c) Any other eligibility requirement set forth by the college or university offering the dual enrollment credits

Students may qualify for the following dual enrollment options, as long as they meet the additional qualifications listed below:

1. The dual enrollment course(s) taken are in addition to regularly scheduled courses and are offered during after school and evening hours at local state colleges and community colleges. Grades received from these dual-enrollment courses are not reported on a student's transcript unless requested and are not included in grade point average or class rank computation.
2. In some cases, students may ask that a college course replace a course the student would normally take as part of their high school schedule. In this case, the student may, if appropriate, be excused from their high school class. The proposed college course must be approved in advance by the Principal. If approved, the grade earned will be included in the computation of class rank and grade point average and will be considered in graduation requirements.
3. A senior who wishes to complete one semester or more of their senior year of high school and the first year of college simultaneously, must meet the college and NCAHS agreed upon grade point average and be in the top 10% of their class. In addition, the Academic and Vocational Assistant Principals must recommend them. Vocational and academic classes must meet or exceed the level of classes available at NCAHS. In addition, the student must follow these steps:
 - a. The student must have passed the MCAS.
 - b. The student must make their intention known as early in the previous year as possible.
 - c. The student and their parent/guardian will meet with the Principal to discuss their reasons for the request.
 - d. Conditions related to participation in the program, graduation requirements, transportation, cost, and, if necessary, withdrawal procedures will be reviewed.
 - e. The student must have taken the SATs in their junior year.

The grades earned will be included in the computation of class rank and grade point average and will be considered in graduation requirements.

Dual Enrollment Course Descriptions

Students at NCAHS may participate in a Dual Enrollment Program with Massasoit Community College. The student is given both high school and college credit for the courses. College credits accumulated through this program can be used at Massasoit Community College or transferred to the college of their choice, if applicable.

(1500) Elementary Spanish I (Grade 12) – CP Level 1 (1st Semester Senior Year)

This is a dual enrollment class taught at NCAHS by a Massasoit Community College professor. (Satisfies the GER in Foreign Language, first-semester level.) An introduction to elementary syntactic, semantic, phonetic and paralinguistic structures is offered. Pertinent everyday cultural concepts are discussed. Relevant comparison and contrast with the native language is treated. Functional communication in the second language in a controlled environment is the principle objective of the course. Students will receive both high school and college credit for this course.

Prerequisite: Students must have the minimum GPA agreed upon by the high school and college, meet all other eligibility requirements and be recommended by their counselor.

(1505) Elementary Spanish II (Grade 12) – CP Level 1 (2nd Semester Senior Year)

This is a dual enrollment class taught at NCAHS by a Massasoit Community College professor. (Satisfies the GER in Foreign Language, second-semester level). The further study of elementary, syntactic, semantic, phonetic and paralinguistic structures is offered. Pertinent everyday cultural concepts are discussed. Relevant comparison and contrast with the native language is treated. Functional communication in the second language in a controlled environment is the principle objective of the course. Students will receive both high school and college credit for this course.

Prerequisite: Students must have the minimum GPA agreed upon by the high school and college, meet all other eligibility requirements, be recommended by their counselor and have successfully completed Elementary Spanish I.

(1502) English Composition I -- CP Level 1 (1st Semester Junior Year)

This course helps students develop and organize extended pieces of writing. Students focus on the correct and appropriate use of language and the organization and development of paragraphs and essays. Research techniques, documentation of sources, and a short research paper are included. Constant reading and frequent writing is required.

(1503) English Composition II -- CP Level 1 (2nd Semester Junior Year)

This course strengthens students' skills as writers and focuses on analysis and argument. Assignments include critical examination of literature and an essay using research and documentation utilizing the MLA style sheet. Emphasis is on writing as part of the processes of thinking and learning.

(1506) Psychology --CP Level 1 (1st Semester Senior Year)

This course is an introduction to Psychology as the science of human behavior. Major topics include scientific method, history of psychology, learning, motivation, emotion, social psychology, and perception.

(1507) Statistics -- CP Level 1 (2nd Semester Senior Year)

This course provides a basic introduction to statistics. It is recommended for students in business, social science, human resources, allied health, and criminal justice and provides an excellent preparation for any career. Topics include descriptive statistics, probability, probability distributions, the normal distribution, hypothesis testing, estimates and sample sizes, the chi square distribution, correlation, and regression.

ARTICULATION AGREEMENTS

Articulation agreements are designed to build strong partnerships between the high school and colleges/universities, whereby students receive college credit while still in high school. This collaboration allows for Norfolk Aggie students to be awarded college credits for work completed at the high school level. The partnership becomes a binding agreement between a high school program and the college or university.

Norfolk Aggie currently has articulation agreements with the following institutions. Students should speak with their guidance counselor to review the most current list of available programs.

- Massasoit Community College, Canton, MA
 - Veterinary Technology
- Stockbridge School of Agriculture, Amherst, MA
 - All agricultural majors
- Unity College, Unity ME
- Paul Smith's College, Paul Smiths, NY
- Keene State
- University of New Hampshire
- New England Tech

THE VOCATIONAL AGRICULTURE PROGRAM

DIESEL AND MECHANICAL TECHNOLOGY PROGRAM

This program prepares students for work and further education in: diesel engines, hydraulics, two and four stroke small engines, welding and equipment operations and service. Students are offered a varied curriculum that explores careers and provides specialized, hands-on training in the dynamic technology that drives the mechanics industry. Students will round out their skills with training in management, computer applications, communications, mathematics and physics.

GRADE 9

(8112/8113) Introduction to Mechanical Technology I and II

GRADE 10

Required Courses: (8210) Woodworking
(8220) Equipment Operations
(8221) Small Engine Power
(8240) Welding

*** Plus two electives from any department**

GRADE 11

Required Courses: (8310) Metal Fabrication
(8320) Heavy Equipment Operations
(8330) Small Engines: Theory and Service
(8340) Small Engine Equipment
(8370) Power Mechanics
(8380) Facilities Repair & Construction I
(8381) Diesel Engines: Fundamentals, Service & Repair
(9812) Career and Technology III

GRADE 12

Required Courses: (8410) Welding Fabrication
(8419) Construction Systems & Facilities Repair
(8421) Hydraulics: Fundamentals, Service and Repair
(8481) Diesel Engines: Advanced Diagnostics & Electronic Controls
(8490) Equipment Components
(9912) Career and Technology IV

Elective Choices: (8431) Sheet Metal
(8451) Vehicle Electronic and Electrical Systems
(8470) Wood Fabrication
(8520) Four Cycle Engine certification

DESCRIPTION OF DIESEL AND MECHANICAL TECHNOLOGY COURSES

(8112/8113) Introduction to Mechanical Technology I and II (Grade 9)

This course acquaints the incoming student to Norfolk County Agricultural High School with different laboratories, classes and opportunities in the Diesel and Mechanical Technology Department, as well as careers in agricultural mechanics. Students will observe demonstrations and gain hands-on experiences in a variety of units associated with tools and equipment, engine mechanics, metals and welding, and small scale construction.

(8210) Woodworking (Grade 10)

This course prepares students to safely and knowledgeably use a variety of hand and power woodworking tools. Students are taught to design, layout and shape stock, assemble, mark, saw, finish and repair wood products. The planning, preparation and interpretation of mechanical and architectural sketches is also included.

(8220) Equipment Operations (Grade 10)

This course prepares students to safely operate and perform basic service on a variety of agricultural machinery and equipment including gas and diesel tractors.

(8221) Small Engine Power (Grade 10)

This course prepares students to select and safely use a variety of hand and power tools commonly used with machinery, equipment, structures and utilities. The conversion of mechanical, electrical and thermal energy from one form to another is studied in many different applied lab exercises.

(8240) Welding (Grade 10)

This course prepares students to identify materials and to fabricate a variety of products made of metals. Included is instruction in the selection and safe use of hand and power metal working tools. Flat position electric arc welding and oxy-fuel cutting are taught.

(8310) Metal Fabrication (Grade 11)

This course prepares students to design and fabricate projects made of metal. Students will continue to use the electric arc welder in the flat position. Out of position welds will be introduced. Production welds, advanced gas welding and cutting are also taught. Students will be introduced to thermal plasma arc cutting.

(8320) Heavy Equipment Operations (Grade 11)

Students will learn to safely operate and maintain equipment used in the agricultural/excavation industries. An important component of the course includes laws, permits, and regulations pertaining to utilities, safety standards and the environment required to obtain a Massachusetts Department of Safety hoisting license.

(8330) Small Engines: Theory and Service (Grade 11)

Students will learn the operating principles of the single cylinder two-stroke and four-stroke engines. Hands-on engine overhaul will be performed by all students. Instructions will also be given on fuel, ignition, lubrication and starting systems. Diagnostics for engine troubleshooting and tune-up will also be learned with the safe and proper use of mechanics' tools and equipment.

(8340) Small Engine Equipment (Grades 11)

This course prepares students to maintain, diagnose problems and do basic repairing and servicing of landscaping and snow removal equipment. Students perform scheduled maintenance, diagnose fuel, electrical and mechanical problems, and make basic adjustments and repairs on two-stroke and four-stroke gasoline engines.

(8370) Power Mechanics (Grade 11)

This course teaches students the operating principles of multiple cylinder gasoline engines and hydraulic systems. Students will also learn to maintain and make basic repairs on gasoline-powered tractors, excavation equipment and landscape equipment. Manufacturer's guidelines to establish routine maintenance schedules to diagnose and repair minor problems are utilized.

(8380) Facilities Repair and Construction I (Grades 11)

This woodworking and metalworking course prepares students to construct and repair buildings. Students use a variety of woods, fasteners, tools and finishes to construct sheds, fences, dog houses and perform agricultural building repairs. Students will receive experiences in reading building layout plans. Foundation construction, roofing, insulation and finishing projects will be conducted.

(8381) Diesel Engines: Fundamentals, Service and Repair (Grade 11)

Students will learn industry concepts and troubleshooting procedures. This "hands on" course prepares students with preventive maintenance skills, fundamental repair and diagnosis of cylinder head/ valve train, engine block, lubrication/cooling systems, air induction/exhaust systems, starting/charging systems, and common safety practices related to this industry.

(8410) Welding Fabrication (Grade 12)

This course provides a study of the properties of metals and common welding processes used in the manufacture and repair of farm and light industrial equipment. Experience will emphasize repair and all position arc welding and oxyacetylene processes.

(8419) Construction Systems & Facilities Repair (Grade 12)

This course will introduce students to the systems of a building including their construction and repair. Students will learn basic plumbing and electrical circuitry including low voltage wiring and fundamental concepts for irrigation systems needed for an agricultural facility. Students will receive experiences in blueprint reading. Students will be involved in a variety of projects which may include shed construction/repair, fences, dog houses and other agricultural building construction or repair.

(8421) Hydraulics: Fundamentals, Service, and Repair (Grade 12)

Students will learn the principles of fluid power, fluid flow, fluid symbols/diagrams; to gain a working knowledge of hydraulic systems concepts, physics principles, and transmission of energy fundamentals

necessary to enter the heavy equipment repair field. This hand on course covers operations and troubleshooting of hydraulic systems and pumps, electrical/manual controls, system design, repair and maintenance.

(8431) Sheet Metal (Grade 12)

This course introduces students to sheet metal layout and processes. It covers the hand and power tools used in the sheet metal trade, including layout tools and cutting, bending, and forming machines. Parallel line development, radial line development, and triangulation are taught. Pattern transfer and cutting, forming, and assembling parts are introduced.

(8451) Vehicle Electrical and Electronics Systems (Grade 12)

This course introduces the fundamental theories, circuits, and devices used in electrical and electronics. Students learn about magnetism, basic electrical circuits, and schematics. They will use Ohm's Law to solve problems, test and replace defective fuses, fusible links, circuit breakers, relays and solenoids. Electrical meters will be used to check applied voltages current flow, resistance, and to find shorts and grounds. It covers direct and alternating current theory, test equipment, semiconductor devices, motors, and generators. Students will perform tasks on battery systems, starter systems, charging systems, and ignition systems. Students will identify oscilloscope patterns and troubleshoot electronic ignition components.

(8470) Wood Fabrication (Grade 12)

This is an advanced woodworking course that prepares students to construct major woodworking projects. Students will design their own wood project, select and cut materials, assemble the project and finish the project appropriately. Class projects include landscape and farm construction.

(8481) Diesel Engines: Advanced Diagnostics & Electronic Controls (Grade 12)

This advanced Diesel engine course will prepare students to be employed or further their education in the Mobile Heavy Equipment, Farm Equipment Mechanics fields. In this hands-on course, students will learn the theoretical and practical knowledge to service and repair Electronic Ignition, Computer Systems and Engine Management Systems, as well as Intercooler and Turbocharger systems. Students will gain knowledge in the latest tools and techniques used to repair and maintain diesel powered machines. This advanced course involves critical thinking and problem solving skills and assists in preparing students for certification as an (ASE) Diesel Technician.

Prerequisite(s): Teacher recommendation

(8490) Equipment Components (Grade 12)

This introductory course will introduce the student to a number of specialized areas that a diesel technician will encounter. Through classroom lecture and lab, students will learn maintenance and repair procedures for heavy-duty equipment components. The lab will provide practical experience in troubleshooting, repair and maintenance of these components.

(8520) Four-Cycle Engine Certification (Grade 12)

This course will prepare students to take the Outdoor Power Equipment technician certification exam. Students will review basic four-cycle engine knowledge in several different areas, including technical skills, fundamental theory, failure analysis, troubleshooting and general repairs.

Prerequisite: Teacher recommendation

THE ANIMAL AND MARINE SCIENCE PROGRAM

GRADE 9

(9003/9004) Introduction to Animal Science I and II

GRADE 10

Required Courses: (9220) Herpetology and Avian Science
(9250) Canine, Feline and Veterinary Science
(9260) Small Animal and Marine Science
(9271) Farm Management and Equine Science

*** Plus two electives from any department**

GRADE 11 AND 12 CONCENTRATIONS

Canine Science
Equine Science
Farm and Livestock Management
Marine Science
Research Animal Technology
Veterinary Science

REQUIRED COURSES FOR ALL ANIMAL & MARINE CONCENTRATIONS:

Anatomy and Physiology*
Career and Technology III*

Breeding and Genetics*
Career and Technology IV*

CONCENTRATIONS WITHIN THE DEPARTMENT

Each student will be scheduled for eight courses per year. Required courses for each concentration are listed below. Once students have been signed up for their required vocational courses, they may choose their remaining courses from a list of pre-determined electives.

VETERINARY SCIENCE

Grade 11

(9310) Animal Anatomy and Physiology*
(9812) Career and Technology III*
(9450) Canine Behavior and Health I
(9380) Veterinary Science I
(9570) Research Animal Technology I

Grade 12

(9610) Breeding and Genetics*
(9912) Career and Technology IV*
(9680) Veterinary Science II
(9790) Animal Behavior

FARM AND LIVESTOCK MANAGEMENT

Grade 11

(9310) Animal Anatomy and Physiology*
(9812) Career and Technology III *
(9373) Farm Management I
(9380) Veterinary Science I
(9473) Field, Forage and Equipment. Management

Grade 12

(9610) Breeding and Genetics*
(9912) Career and Technology IV*
(9674) Agricultural Marketing
(9773) Livestock Management II

CANINE SCIENCE

Grade 11

- (9310) Animal Anatomy and Physiology***
- (9812) Career and Technology III ***
- (9350) Canine Breeds and Handling
- (9450) Canine Behavior and Health I
- (9550) Grooming and Kennel Management I

Grade 12

- (9610) Breeding and Genetics***
- (9912) Career and Technology IV ***
- (9650) Canine Behavior and Health II
- (9750) Grooming and Kennel Management II

EQUINE SCIENCE

Grade 11

- (9310) Animal Anatomy and Physiology***
- (9812) Career and Technology III ***
- (9341) Equine Science I
- (9441) Equine Science II
- (9473) Field, Forage & Equipment Management

Grade 12

- (9610) Breeding and Genetics***
- (9912) Career and Technology IV ***
- (9641) Stable Management I
- (9741) Stable Management II

RESEARCH ANIMAL TECHNOLOGY

Grade 11

- (9310) Animal Anatomy and Physiology***
- (9812) Career and Technology III ***
- (9380) Veterinary Science I
- (9373) Farm Management I
- (9570) Research Animal Technology I

Grade 12

- (9610) Breeding and Genetics***
- (9912) Career and Technology IV ***
- (9680) Veterinary Science II
- (9870) Research Animal Technology II

MARINE AND FRESHWATER SCIENCE

Grade 11

- (9310) Animal Anatomy and Physiology***
- (9812) Career and Technology III ***
- (9462) Marine and Freshwater Biology
- (9464) Aquatic Studies
- (9422) Pet Shop and Aquarium Management I

Grade 12

- (9610) Breeding and Genetics***
- (9912) Career and Technology IV ***
- (9862) Marine Life I
- (9863) Marine Life II

*These courses are required of all Animal Science majors

DESCRIPTION OF ANIMAL AND MARINE SCIENCE COURSES

(9003/9004) Animal Science I and II (Grade 9)

This course acquaints the incoming student to Norfolk County Agricultural High School with the different laboratories, classes and options in the Animal and Marine Science Department, as well as careers in Animal and Marine Sciences. Students will develop skills that form a foundation for the study of animal and marine sciences. Students will enhance their experience through hands-on, lab opportunities.

(9220) Herpetology and Avian Science (Grade 10)

Students will learn about different species, handling techniques and care of birds, reptiles and amphibians. Students will explore careers involving these animals. Basic management techniques of pet shops, aviaries and research facilities will be covered.

(9250) Canine, Feline and Veterinary Science (Grade 10)

Students will learn handling techniques and health care for cats and dogs. The history, breeds, grooming and care of dogs and cats will be stressed. In addition, students explore career choices involving canine and veterinary science. Students will investigate common topics related to the veterinary science field.

(9260) Small Animal and Marine Science (Grade 10)

Students learn skills necessary for the proper handling, nutrition and care of small animals. In addition, students explore careers involving small animals and marine science. Students will investigate freshwater and marine fish and aquarium maintenance.

(9271) Farm Management and Equine Science (Grade 10)

This course covers management techniques for beef, sheep, swine, dairy and horses. Students will learn care, management and feeding for these animals, along with safe handling. Student lab activities focus on hands-on experiences with these animals and tasks involved in their daily care.

(9310) Anatomy and Physiology (Grade 11) (Year Long)

This course will provide an overview of the functional anatomy and physiology of domestic animals commonly encountered in the animal science industry. Emphasis is placed on the parts (gross anatomy) and function (physiology) of the systems of the animal body and the associated terminology. Topics include: musculoskeletal system, circulatory system, respiratory system, integumentary system, urinary system, nervous system, endocrine system and the digestive system. The class may utilize live animals, specimens, dissections, guest speakers, radiographs, microscopes and more.

(9341) Equine Science I (Grade 11)

During this course, students will learn horse gaits, movements and balanced seat equitation. This course will also cover horse colors, breeds, disciplines and blanketing. Additionally; care of the horse including grooming, clipping, and lunging will be studied and practiced. Some stable management will be learned involving cleaning stalls, managing the stable, as well as record keeping. A deeper look into tack, aids, equitation and showmanship will be presented during this course. Equine careers and colleges will be discussed to help students plan for their future. Lab times will sometimes involve riding, sometimes management skills. Students will be grouped according to their riding ability and the labs will proceed at each student's pace.

(9350) Canine Breeds and Handling (Grade 11)

Students learn the basics of how to prepare and handle dogs for the conformation ring. The students will study the breeds of dogs approved by the American Kennel Club, the various uses of dogs, and the regulations and activities of the AKC.

(9373) Farm Management I (Grade 11)

Raising and managing livestock animals with a focus on nutrition, feeding, common diseases and parasite prevention. Selecting and evaluating livestock and dairy animals for breeding and marketing will also be covered. This course will also explore career opportunities and training in the livestock industry.

(9380) Veterinary Science I (Grade 11)

This course introduces various medical topics to prepare the student for further training in animal medical health fields and to assist in employment as a veterinary assistant. After a brief history and orientation of the veterinary assistant career, students will learn the basics of animal disease, restraint, sterile techniques, radiology, wound healing, humane issues, and lab procedures.

(9422) Pet Shop and Aquarium Management I (Grade 11)

The business aspect of aquariums and pet shops will be stressed. Students will learn about customer relations, advertising, marketing and business plans related to pet stores. Advanced animal handling will be covered for aviculture as well as rodents, reptiles and fish. Tank maintenance and aquarium species will also be covered.

(9441) Equine Science II (Grade 11)

Advanced grooming techniques and the care of horses will be studied including clipping, braiding and mane pulling. Equine health will be explored regarding colic, bandaging, restraints and the farrier. Further topics such as horse conformation, unsoundnesses and blemishes will be covered during the course. Jumping terminology, course design and equitation are emphasized through lectures and lab activities. Lab times will sometimes involve riding, sometimes management skills. Students will be grouped according to their riding ability and the labs will proceed at each student's pace.

(9450) Canine Behavior and Health I (Grade 11)

This is a canine behavior and obedience course from birth through adult life. Students will work with dogs to learn basic obedience techniques. This course also covers the basics of canine diseases and their prevention and explores animal welfare and animal rights issues.

(9462) Marine and Freshwater Biology (Grade 11)

Students will study what it takes to maintain animals in an aquarium and zoo setting. The class will cover freshwater and marine species of animals. Students will explore the husbandry and training of marine animals including fish, whales, dolphins and more. Types of aquariums, filters, feed and lighting will be discussed. Careers associated with aquariums, zoos, and marine biology will be explored as well as special programs available to high school students involving aquatic studies.

(9464) Aquatic Studies (Grade 11)

Students will learn about the ocean and ocean life. Beachcombing will be covered including identifying shells on the beach. Course topics will include the dynamics of the ocean; tides, currents, red tide, tsunamis and more. Students will grasp issues facing marine species like pollution, climate change, and oil spills. In addition, marine species and their habitats will be explored including coral reefs, jellies, manatees, seals and sea lions. SCUBA equipment and methods of ocean exploration will be reviewed during this course. Careers and colleges will also be discussed for students to help plan their future.

(9473) Field, Forage & Equipment Management (Grade 11)

Developing and maintaining pasture land, preparing land for crops, and the planting, culture and harvesting of animal food crops will be studied in this course. Students will also learn about feed quality and pasture/forage crop selection, uses and identification of grasses and common feed crops. Students will also learn to safely operate and maintain equipment used in farm operations, forage production and other agricultural enterprises. Students will learn to evaluate and estimate the cost of feeds in the livestock industry.

(9550) Grooming and Kennel Management I (Grade 11)

This course introduces the use of equipment and basic techniques used in the grooming of dogs. Customer relations are an essential part of the course. Practical application by grooming medium- and short-hair dogs is done in the lab. The course introduces students to kennel management techniques.

(9570) Research Animal Technology I (Grade 11)

This course introduces students to the role animals play in biomedical research. It focuses on the humane care and use of laboratory animals and regulatory oversight. Students will learn about the common animals used in the lab, basic biology, husbandry, experimental techniques and ethical considerations necessary for a career in today's high paying biotechnology jobs in lab animal science. Student lab activities focus on proper husbandry and restraint techniques for lab animals.

(9696) Zoo and Exotic Animals (Grade 11)

This course emphasizes the unique needs of animals in captivity, as well as those raised as a non-native species in New England. Studies will focus on management, care, breeding, environmental enrichment, dietary needs and the health care of a wide range of zoos and exotic species.

(9610) Breeding and Genetics (Grade 12)

Students will discuss the basics of animal genetics, modes of inheritance, gene action and commonly inherited traits of domestic animals. In addition, students will learn the breeding systems utilized by small and large animal operations.

(9622) Pet Shop and Aquarium Management II (Grade 12)

Students will learn advanced animal handling techniques, as well as breeding, management and care of rodents, reptiles and fish. Environmental enrichment, disease control, hand rearing and animal regulations will also be addressed.

(9641) Stable Management I (Grade 12)

Students will learn to manage horses and their facilities. Students will study and practice fitting tack, horse safety, first aid, and record keeping. Topics such as feeding, conditioning horses, pasture management, fencing types and trailering horses are included in this course. Disciplines will be studied including cross country and some western events. Lab times will sometimes involve riding, sometimes management skills. Students will be grouped according to their riding ability and the labs will proceed at each student's pace.

(9650) Canine Behavior and Health II (Grade 12)

This course builds on the behavior and obedience skills taught in Canine Behavior and Health I and studies canine breeding and raising puppies. The variety of canine activities in the industry is explored. Teaching obedience and learning advanced training skills including agility, jumping and retrieving are major facets of the class.

(9674) Agricultural Marketing (Grade 12)

Students will explore livestock marketing trends in New England as well as nationally and globally. The course will discuss livestock generated products and added value strategies. Animal processing techniques will be investigated. We will develop marketing plans for beef, dairy, poultry, sheep and swine products. Pricing methods, marketing decisions, as well as supply and demand will be examined. Additionally, the movement of farm to table will be recognized and discussed further.

(9680) Veterinary Science II (Grade 12)

Students taking this course will assist in the general medical care of animals at NCAHS. Topics and projects will include brief overviews of a number of representative animal diseases, and parasitic diseases. In preparation for employment as a veterinary assistant, animal restraint, veterinary clinic management and work safety will be studied.

(9695) New England and North American Wildlife (Grade 12)

With a concentration on New England wildlife, students will learn about the wild animals of North America. Emphasis will be placed on natural instinct, identification, tracking, life cycles, preservation and rehabilitation of animals. The skills learned will widen the student's knowledge of wild animal care, zoonotic disease and the impact of wild animals on public health.

(9741) Stable Management II (Grade 12)

Equine diseases, reproduction, and basics of training are a few topics that will be explored during this course. Students will learn about training techniques, harness driving, long lining and advanced management skills needed for working in the equine industry. Some disciplines will be examined more closely, especially dressage and saddleseat. Lab times will sometimes involve riding, sometimes management skills. Students will be grouped according to their riding ability and the labs will proceed at each student's pace.

(9750) Grooming and Kennel Management II (Grade 12)

Students will learn to work in and manage kennels. Record keeping, care and feeding, customer relations, sanitation and safety are included. This course also focuses on more advanced grooming skills including clipping and scissoring for all dog breeds, as well as grooming of cats.

(9773) Livestock Management II (Grade 12)

Managing breeding animals and their offspring will be covered. In this course, students will learn to evaluate and select sires and breeding stock as well as care for young animals. Students will gain a knowledge of lambing, kidding, calving, farrowing and hatching. Students will also learn common youngstock management practices such as docking, ear notching, and ear tagging.

(9790) Animal Behavior (Grade 12)

Understanding animals is vital to anyone pursuing an animal career. Using animal models and studying animal behavior, students will be introduced to the fundamental principles of animal psychology. Topics will include animal behavior of domestic animals as well as wild animals.

(9862) Marine Life I (Grade 12)

Students will study life in the ocean more in depth. This class will focus on fish, fisheries and aquaculture. The fish studied will include bony fish as well as cartilaginous fish such as sharks, rays and skates. Students will learn about fish species, caring for fish on small and large scales as well as fish health and diseases. Topics will include types of fishing, conservation efforts and sustainable fishing. Aquaculture is becoming very popular. It involves farming aquatic species like fish, crabs, scallops, etc. Students will learn the management of aquaculture facilities and learn how to care for the animals on such a large scale. Additionally, students will learn about seabirds so they will be able to identify different species and learn about some of their behaviors and how they work into the marine ecosystem.

(9863) Marine Life II (Grade 12)

Students will study the different animals of the ocean. Topics will include some invertebrates such as crabs, sand dollars, lobsters, shrimp and starfish. Students will learn species identification as well as the anatomy of marine invertebrates. In order to understand their anatomy, some labs will involve dissections. A closer look into toothed whales will involve discussing dolphin species, training them at aquarium facilities and learning the careers associated with them. Marine conservation efforts will be identified and discussed in detail.

(9870) Research Animal Technology II (Grade 12)

This course builds on the concepts explored in Research Animal Technology I. It expands its coverage of animals used in research to include: zebrafish, non-human primates, dogs and cats, livestock animals, and non-traditional species. The areas of focus will be on the development of scientific methods, how to interact as part of the scientific team, and "hands-on" veterinary and scientific assistance to biomedical researchers. This course is specifically designed to prepare students for starting a career path in lab animal science.

THE HORTICULTURE PROGRAM

Horticulture students are offered a varied curriculum that explores careers, presents technical and botanical knowledge and develops an awareness and appreciation of our sustainable natural resources and their responsible stewardship.

CORE COURSES

GRADE 9

(7117/7118) Intro to Horticulture I and II

GRADE 10

Required Courses: (7222) Introduction to Urban Forestry/Arboriculture
(7230) Horticulture
(7240) Landscape Operations
(7223) Floriculture

*** Plus two electives from any department**

GRADES 11 AND 12 CONCENTRATIONS

Urban Forestry
Landscape Management
Horticulture

REQUIRED COURSES FOR ALL CONCENTRATIONS:

Botany and Soils
Plant Health Care
Plant Materials I
Plant Materials II
Career and Technology III
Career and Technology IV

THE HORTICULTURE PROGRAM

CONCENTRATIONS WITHIN THE DEPARTMENT

Each student will be scheduled for eight courses per year. Required courses for each concentration are listed below. Once students have been signed up for their required vocational courses, they may choose their remaining courses from a list of pre-determined electives.

URBAN FORESTRY

Grade 11

(7313) Botany and Soils*
(7521) Plant Materials I*
(9812) Career and Technology III*
(7321) Urban Forestry I
(7322) Urban Forestry II

Grade 12

(7311) Plant Health Care*
(9912) Career and Technology IV*
(7522) Plant Materials II*
(7425) Community Forestry
(7426) Tree Care Academy
(7423) Urban Forestry III
(8347) Small Engine Theory and Service

LANDSCAPE MANAGEMENT

Grade 11

(7313) Botany and Soils*
(7521) Plant Materials I*
(9812) Career and Technology III*
(7346) Landscape and Garden Design I
(7381) Landscape Management I
(7382) Landscape Management II

Grade 12

(7311) Plant Health Care*
(9912) Career and Technology IV*
(7522) Plant Materials II*
(7447) Landscape and Garden Design II
(7571) Turf Management
(8347) Small Engine Theory & Service

HORTICULTURE

Grade 11

(7313) Botany and Soils*
(7521) Plant Materials I*
(9812) Career and Technology III*
(7512) Flower Gardening
(7352) Greenhouse Management
(7342) Floral Design I

Grade 12

(7311) Plant Health Care*
(9912) Career and Technology IV*
(7522) Plant Materials II*
(7445) Advanced Floral Design I
(7353) Greenhouse Crops/Interiorscapes
(7475) Sustainable Horticulture and Landscaping

*These courses are required of all Horticulture majors

DESCRIPTION OF HORTICULTURAL COURSES

(7117/7118) Introduction to Plant Science I and II (Grade 9)

This course is designed as a survey of the concentrations available in our Plant Science Department. Students will develop skills and knowledge that form a foundation for the study of biological and natural sciences in the plant world. In addition to career exploration, students will learn environmental influences of all plants: horticultural techniques and practices: as well as an introduction to basic botany. Students will enhance and build upon these skills by engaging in hands-on laboratory exercises, both scientific and vocational.

(7222) Introduction to Urban Forestry/Arboriculture (Grade 10)

Students will be introduced to the study and care of trees as well as learning about tree climbing, safe chainsaw operation and chipper use and maintenance. Tree pruning will be covered, and students will be exposed to career opportunities in the field of arboriculture.

(7223) Floriculture (Grade 10)

Floriculture involves the study of the floral industry with an emphasis on developing floral design skills. Students will be introduced to basic floral design skills and identification of procedures, and identification of flower/foilage used in the industry. Students' lab time will be utilized as hands on experience developing skills and expertise in floral arranging and developing technique. Students will study careers, tool identification, botany and other practices of the trade needed to learn basic arrangements and novelty pieces.

(7230) Horticulture (Grade 10)

Horticulture includes the cultivation, processing and sale of fruits, vegetables, ornamental plants and flowers. Students receive hands-on training in orchard pruning, cranberries, interiorscapes, planting, transplanting and market gardens. Students will work with annuals, perennials, greenhouse plants and flowering bulbs. They will also be involved in preparing for the annual plant sale and marketing products for direct sale and understanding the business aspects of horticulture.

(7240) Landscape Operations (Grade 10)

Landscape Operations involves the study of the landscape industry with emphasis on developing basic landscape skills. Students will study lawn care and maintenance, pruning, planting and transplanting, mulching, maintenance and landscape nursery production. Students will also acquire experience working on campus and learning industry standards for landscape service professionalism .

(7313) Botany and Soils (Grade 11)

This Botany and Soils course is designed to give our students an education of plant science and soils. The students will develop an understanding of plants on the cellular level as well as understanding plant physiology and functions. The importance of soil science, soil chemistry, and classification will be studied in a lab setting. Soil and plant ecology will be a underlying themes of this course.

(7321) Urban Forestry I (Grade 11)

Students will be introduced to the study and care of trees. Students will learn to install climbing lines, enter the tree and begin to move about the canopy. Safe chainsaw operation, chipper use and maintenance will be covered. Pruning will be introduced.

(7322) Urban Forestry II (Grade 11)

Study continues with an emphasis on pruning and tree planting, and advanced skills in tree climbing will be introduced. Students will study and become proficient in the *American National Standards Institute Z-133 Safety Standards for Tree Operations*.

(7342) Floral Design I (Grade 11)

Floral design is the art of flower arranging and focuses on color harmony, scale and style. Students will learn tools, procedures and plant materials used for cut flowers and foliage. During lab classes students will use the principles and elements of floral design in completing arrangements.

(7346) Landscape and Garden Design I (Grade 11)

Students will design landscapes and gardens using drafting techniques necessary for presentation and estimation of ideas and contracts. Techniques for lettering, line work, scale drawings, elevations and profiles as well as field measurement and layout of scale drawings will be taught. Students will embrace the design process and learn design principles, site analysis and how to craft marketable working drawings.

(7352) Greenhouse Management (Grade 11)

Greenhouse Management is the study of the cultivation of flower crops in a greenhouse. Students will study the different types of greenhouses and how they are heated and cooled, watered, fertilized, and maintained to properly grow crops. Students will also learn how to propagate plants from cuttings and seed, proper handling and use of soil mixes, growing potted plants and cut flowers and assist with maintenance and production of crops in greenhouse structures.

(7381/7382) Landscape Management I and II (Grade 11)

Landscape Management studies the principles and practices of grounds maintenance businesses. Equipment selection and safe operation will be presented along with current trends in the landscape industry; inclusive of turf, hardscapes, trees, shrubs and flowers. Students will develop practical experience working, designing, creating and maintaining important pieces of the designed landscape on campus.

(7512) Flower Gardening (Grade 11)

Flower Gardening is a course which includes the identification, propagation and maintenance of annual bedding plants, herbaceous perennials, herbs and ornamental grasses. Students will be actively involved in the care of the school's herbaceous collections, as well as the design and construction of new plantings.

(7521) Plant Materials I (Grade 11)

This course will acquaint students with thirty plants, including trees and shrubs that are hardy to the northeastern climatic zones. The student will learn the system of scientific classification and nomenclature of plants as well as the importance of plant morphology in the identification process.

(7311) Plant Health Care (Grade 12)

This course studies insects, diseases and the related health problems common to trees, shrubs and herbaceous plants. Insect identification and disease diagnosis (both infectious and non-infectious) will be explored through their causes, symptoms and significance. Integrated pest management, environmentally safe application of pesticides and preparation for pesticide certification exams will be included. This course is required for all plant science majors.

(7353) Greenhouse Crops/Interiorscapes (Grade 12)

Students will learn the identification, propagation, and production of the major greenhouse plants grown in New England. Students will be actively working in the school's greenhouses. Topics to be discussed will be Poinsettias, Chrysanthemums, bulb plants, lilies and other holiday plants.

(7423) Urban Forestry III (Grade 12)

Second-year Urban Forestry students will begin pruning large trees and incorporating chainsaw use in trees. They will become proficient in the use of climbing spurs and begin tree rigging and removal. Hazard tree evaluation will also be introduced.

(7425) Community Forestry (Grade 12)

This course will address a wide range of economic, environmental, regulatory, aesthetic and social issues involving tree care management and its relationship to the local community. Students in this class will gain an understanding of how these environmental science principles are connected to plant health care, plant identification, soil science, sustainable practice and botany. Students will engage in community projects with the town of Walpole Parks Department alongside the Tree Warden to get hands on experience within a municipality.

(7445) Advanced Floral Design I (Grade 12)

This course explores the business principles associated with the successful operation of horticultural related business, florist shops and garden centers. Management areas to be covered include merchandising, shop layout, and retailing skills. Lab classes will develop advanced design skills using horticultural products.

Prerequisite: Floral Design I

(7447) Landscape and Garden Design II (Grade 12)

Students will design landscapes using advanced drafting techniques necessary in landscape drawing and estimation including lettering, line work, scale drawings, elevations and profiles. Students will learn the design process including design principles, site analysis and working drawings.

(7522) Plant Materials II (Grade 12)

This course is a continuation of Plant Materials I. It focuses on the characterization and identification of woody landscape plants common to hardiness zones 3-7.

(7571) Turf Management (Grade 12)

This course prepares students to establish, manage and maintain turf grass areas for ornamental and recreational purposes. Harmful weeds, insects and diseases will be identified and environmentally responsible methods of control will be discussed. Students will also understand the basic layout of golf courses, parklands and public spaces. Exploration of the opportunities and responsibilities of turf care

professionals as well as the maintenance processes and practices performed on ornamental turf will be taught. Students will learn business management practices for the turf industry.

(7475) Sustainable Horticulture (Grade 12)

This course is offered to senior Plant Science and Environmental Science majors in the Spring semester. Students will explore native plant communities and sustainable landscape practices including: citizen science, composting, natural pest control, invasive species, and edible wild plants. They will be applying this knowledge towards the construction of sustainable landscapes: green roof, permeable hardscapes, rain gardens, pollinator gardens, drought tolerant plantings, heritage and perennial vegetables, native plants, rain barrels, drip irrigation and energy efficient landscape lighting.

(8347) Small Engines: Theory and Service (Grade 12)

Students will learn the operating principles of the single cylinder two-stroke and four-stroke engines. Hands-on engine overhaul will be performed by all students. Instruction will also be given on fuel, ignition, lubrication and starting systems. Diagnostics for engine troubleshooting and tune-up will also be learned with the safe and proper use of mechanics' tools and equipment.

THE ENVIRONMENTAL SCIENCE PROGRAM

Environmental Science students will be prepared to enter occupations and/or continue their education in the environmental field. Students will be offered a varied curriculum that explores careers, presents technical and environmental knowledge and develops an awareness and appreciation for sustainability and natural resources (program potentially leads to AP Exam).

CORE COURSES

GRADE 9

(6100/6101) Intro to Environmental Science I and II

GRADE 10

Required Courses: (6223) Introduction to Natural Resources and the Environment
(6224) Forestry
(6221) Introduction to Climate Change
(6222) Energy and the Environment

*** Plus three electives from any department**

GRADE 11

Required Courses: (6301) Environmental Studies*
(6321) Climate Change
(6332) Resource Management
(6336) Sustainability
(9812) Career and Technology III

Elective Choices: (6331) Physical Oceanography
(6338) Mapping and GIS
(6339) Green Engineering
(6345) Energy Efficiency

GRADE 12

Required Courses: (6400) LEED Prep-Green Building
(6405) Water Management
(7430) New England Wildlife
(7660) Contemporary Environmental Issues
(9912) Career and Technology IV*

Elective Choices: (6403) OSHA 40
(6404) Outdoor Leadership Skills and Environmental Policy
(7450) Park Management

DESCRIPTIONS OF ENVIRONMENTAL SCIENCE COURSES

(6100/6101) Introduction to Environmental Science I and II (Grade 9)

This course is designed to expose students to the opportunities in the Environmental Science Program. Students will develop skills that form a foundation for the study of environmental and natural sciences. In addition to career exploration, students will learn scientific method, orienteering, and data collection. Students will enhance and build upon these skills by engaging in hands-on laboratory exercises, both scientific and vocational.

(6223) Natural Resources and the Environment (Grade 10)

Natural Resources and the Environment is a course designed to encourage a positive attitude and concern regarding natural resources and our environment. The main objective is to develop in students an environmental ethic, while teaching them about our own natural resources in Massachusetts and New England. Students will be shown that environmental concern and action must start on the local level and at home. The course work involves both laboratory and field experiments where students will perform both water and soil quality testing and learn about ecology.

(6224) Forestry (Grade 10)

In Forestry we will practice the vocational skills required to be employed in many areas of the agricultural industry. These areas include firewood processing, lumber production, brush removal, trail maintenance, small woodlot management and urban forestry. We will also explore to a lesser degree wildlife management, wildland fire control, forest mensuration and resource conservation. We will always strive to create a culture of safety and hard work in every application.

(6221) Introduction to Climate Change (Grade 10)

One of the goals of Environmental Science is to understand and solve environmental problems. Climate change is the biggest environmental problem we face. This course will provide students with an understanding of climate and how and why the climate is changing and what we can do to slow it down. Also covered will be the local, regional and global impacts of climate change on human, plant and animal communities.

(6222) Energy and the Environment (Grade 10)

The world runs on energy. Every plant, animal and person depends on energy. We need energy to power homes, schools, businesses and farms as well as transportation systems. This course will cover the resources currently used to supply our energy needs and the impacts and consequences of their use. It will also focus on the necessary transition away from unsustainable, dirty, non-renewable fossil fuels to clean, sustainable renewable sources like solar and wind. Students will have a hands on introduction to the basics

of biofuels, photovoltaic systems, solar thermal systems, passive solar, wind turbines, heat pumps and energy auditing. Career opportunities in the expanding clean energy field will be explored.

6301 Environmental Studies (Grade 11)

Environmental Studies is an analysis of how the environmental movement has evolved since the 1850's. Students will learn about the important environmental leaders and the events that have shaped the modern views of our environment. Students will be made aware of how these topics relate to our own local environment and how their community involvement and action can help to resolve those issues.

(6321) Climate Change (Grade 11)

This course builds upon the Introduction to Climate Change class offered to sophomores. (Taking that class first is not a requirement because the basics of climate change will be reviewed in this class.) Topics covered in this class will be grouped as follows: Earth's climate system, evidence of climate change, consequences of our current energy path and policy choices that must be made. What can be done to mitigate future changes and ways that we will have to adapt to climate change will also be covered. Hands on lab work, fieldwork and field trips will be incorporated as much as possible.

(6331)Physical Oceanography (Grade 11)

This course surveys the physical and chemical aspects of the Earth's oceans, including climate, plate tectonics, ocean currents, tides, water atmosphere interface, sediment transport and deep sea hydrothermal vents. An emphasis is placed on the tools scientists use for research.

(6332) Resource Management (Grade 11)

Resource Management investigates the natural resources found in Massachusetts and how these resources are managed. Land use planning, sustainability, zoning regulations, wetland laws, real estate taxes and assessments are studied.

(6336) Sustainability (Grade 11)

The Environmental Sustainability course is designed to introduce students to the concept of sustainability. Together, we will break down and look at the sustainability of various industries at all levels of the supply chain. This course focuses on the environmental, economic, and social impacts that can affect each industries' abilities and the limiting factors to become more sustainable. We will be looking at the challenges, and potential solutions to help industries become more environmentally friendly, while also being economically viable. Students will be analyzing sustainability at the local, regional, national, and global scale. A final project will consist of students conducting an analysis of the sustainability of a specific aspect of Norfolk Aggie.

(6338) Mapping and GIS (Grade 11)

GIS (geographic Information Systems) are used to display information on maps. They are an essential tool for Environmental Science and many other fields. GIS systems are widely used in governmental, commercial and educational organizations. Students in this course will learn how to use ArcGIS software and will apply that knowledge to create accurate layered maps of such things as trails on the Aggie campus or an inventory of trees on campus.

(6339) Green Engineering (Grade 11)

This course will introduce students to engineering as applied to the practical application of environmental technologies that minimize pollution, promote sustainability and protect human health.

The focus will be on designing and implementing on-campus projects to reduce CO2 emissions. For example, students may be involved with the design, installation and monitoring of photovoltaic panels on the roofs of buildings on campus.

(6345) Energy Efficiency (Grade 11)

Energy efficiency saves resources, saves money, mitigates climate change and is good for national energy security. Students in this course will learn how to measure energy, analyze energy use, perform energy audits and justify energy upgrades. Students will also learn how and where to apply practical energy efficient technologies such as LED lighting, air sealing, insulation, heat pumps and advanced controls.

(6400) LEED Prep - Green Building (Grade 12)

LEED is a widely used green building certification system developed by the U.S. Green Building Council. This course will give students an understanding of the LEED system and the principles of sustainability upon which it is based. By the end of the course, students will be ready to take the LEED Green Associate exam. The course will cover practical aspects of green building such as net zero design, sustainable materials, indoor air quality, daylighting, green roofs, water conservation and rainwater management.

(6403) OSHA 40 (Grade 12)

HAZWOPER 40-hour is required for workers that perform activities that expose or potentially expose them to hazardous substances. This course is specifically designed for workers who are involved in clean-up operations, voluntary clean-up operations, emergency response operations, and storage, disposal, or treatment of hazardous substances or uncontrolled hazardous waste sites. Topics include protection against hazardous chemicals, elimination of hazardous chemicals, safety of workers and the environment and OSHA regulations. This course covers topics included in 29 CFR 1910.120.

(6404) Outdoor Leadership Skills and Environmental Policy (Grade 12)

Pre-Environmental Police Officers training- this course focuses on all general laws of the Commonwealth focusing on the protection of natural resources, waterways, commercial and recreational outdoor activities, and federal laws pertaining to the protection of the Commonwealth's natural resources. Topics will include safety and regulations associated with hunting, fishing, boating, and recreational vehicle use in Massachusetts.

(6405) Water Management (Grade 12)

This course introduces students to the different types of water management and the various certifications available for water management. Concepts covered will include: safety in water treatment plants, environmental systems, Title V, engineering design & blueprint reading, methods of water cleaning, contamination disposal, basic equipment maintenance, biological treatment, wet weather & storm water training, and thermal processes. Students will learn about the global water cycle and its various processes particularly groundwater vs. surface water and how they are treated. Additionally students will learn about the various policies and organizations associated with water management such as; New England Water Environment Association, Massachusetts Water Pollution Control Association, Massachusetts Rural Water Association, U.S. EPA – New England, and the MWRA.

(7430) New England Wildlife (Grade 12)

The course will focus on the application of ecological principles of the management and conservation of wildlife resources using a problem-based format. We will cover the history and development of wildlife management as a science; characteristics of, and factors affecting wildlife populations; techniques and theories of management; and wildlife conservation here in New England. This course will use a wide array of scientific literature within a discussion format to expose students to theoretical principles of the ecology and management of wildlife resources. Additionally, we will delve into different techniques, perspectives, and approaches to both identify and achieve wildlife management goals.

(7450) Park Management (Grade 12)

The parks management course introduces students to the many rewarding careers in the exciting and rapidly growing field of parks and recreation management. This course covers park maintenance and environmental restoration techniques. Students are introduced to the essential concepts related to running a business, such as staff management, budget & finance; public speaking as well as state and federal policies regarding public land management.

(7660) Contemporary Environmental Issues

Contemporary Environmental Issues is designed to cover a broad range of contemporary global environmental issues, such as loss of biodiversity, GMOs, pollution, population growth, care of agricultural lands, environmental justice and health. This course focuses on how those big issues are impacting us locally. It develops students' environmental literacy and enables them to take part in informed debate. It explores environmental materials from a variety of media and teaches students how to navigate these materials; how to analyze and evaluate information; how to balance information from a variety of scientific and nonscientific sources.

CO-OPERATIVE EDUCATION PROGRAM (CO-OP)

(6831/6931) Environmental Science

(7831/7931) Horticulture

(8831/8931) Diesel and Mechanical Technology

(9831/9931) Animal and Marine Science

CO-OP is a program option for eligible students in grades 11 and 12 during the final marking period of each school year. The CO-OP program is scheduled during vocational time only. Students are required to attend all of their academic classes. CO-OP provides an opportunity for upperclassmen to participate in a work-experience program related to their major. All conditions can be found on the school's website.

The COOP coordinator will engage in regular communication between the school and the employer throughout the duration of the CO-OP experience. Such communication will include, but not be limited to, pre-placement safety inspections, site visitations and competency tracking. All such contact will provide information by which the performance of the student will be evaluated.

Attendance, work habits, knowledge, skill development, attitude, productivity and quality of work will all be considered evaluation criteria. The final grade of the student's performance is the responsibility of the COOP Coordinator in consultation with the employer.

INTERNSHIP PROGRAM

The purpose of the internship program is to provide an authentic career experience for students in new and emerging fields of agriculture aligned to their chosen major, while increasing post-secondary links for students. These real life experiences will also connect academic and vocational studies to a student's career plan, while reinforcing their positive work habits, ability to demonstrate collaborative teamwork, technical skills, and their related fields and problem solving skills.

Presently there are five internship sites: Arnold Arboretum of Harvard University, Mass General Hospital, New England Wildlife Center, Milton Caterpillar and The Trustees of the Reservation.

The Internship program typically begins mid-May and runs through the last day of school. Students arrive at school as they typically would and are provided school transportation to their respective internship sites returning to NCAHS in time for the bus home.

Eligibility for Participation in Internship Program

- The student must have passing grades for the year in all courses and students must pass all courses third term.
- The student must have passed all MCAS exams (ELA, math, and science).
- The student must possess an OSHA 10 credential before the start of the internship.
- Satisfactory discipline and attendance records as determined by the Dean of Students must be validated.
- Satisfactory internship documents and contracts must be signed and turned in by the predetermined deadlines.
- Satisfactory health records, hygiene requirements and medical documentation, as identified by each host site, must be submitted by the established deadlines.
- Students interested in this program will demonstrate their commitment to their school work as indicated by a cumulative GPA that is deemed satisfactory by the selection committee.
- All financial obligations to Norfolk Aggie have been settled prior to going on the internship.

Failure to meet and maintain the above stated conditions and requirements could result in the termination of the student placement.