

**NORFOLK COUNTY  
AGRICULTURAL HIGH SCHOOL**



**PROGRAM  
OF STUDIES**

**2009-2010**

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The Norfolk County Agricultural High School does not discriminate on the basis of race, color, sex, sexual orientation, religion, national origin, or handicap in its education activities or employment practices as required by Section 504 of the 1973 Rehabilitation Act, and by Chapter 622 of the General Laws of the Commonwealth of Massachusetts.

NEW ENGLAND ASSOCIATION  
OF SCHOOLS AND COLLEGES  
ACCREDITED MEMBER

## INTRODUCTION



### **Norfolk County Agricultural High School**

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The Program of Studies that follows describes the current course offerings, promotion and graduation requirements, 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. As state requirements for graduation and college entrance change, NCAHS will adjust the Program of Studies to meet these standards. NCAHS guarantees that students, as well as parents/guardians, will be informed and advised regarding educational changes that directly affect future aspirations.

NCAHS's counselors and teachers encourage students to consider programs of study, courses, extracurricular activities and occupational opportunities on the basis of individual interests, abilities and skills. Limited-English-Proficient students are provided with services to support their needs. Students in pursuit of educational and occupational opportunities that are non-traditional for their gender are supported and encouraged by the staff and faculty.

Preparation for career success is an essential component of the education offered at NCAHS. In addition to the new standards being applied to core academic course work and the core vocational work, NCAHS remains committed to the importance of work-experience and career-preparatory programs. NCAHS intends to support and expand educational opportunities that provide students work experience where they are allowed to apply the knowledge and skills they have acquired in their classrooms and labs.

## **NCAHS PHILOSOPHY AND GOALS**

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	6.0
10	10.5	7.5
11	7.5	10.5
12	7.5	10.5

In order to be promoted to grade 10, 2 of 3 vocational courses must be passed.

In order to be promoted to grade 11, 7 of 8 vocational courses must be passed.

In order to be promoted to grade 12, 7 of 8 vocational courses must be passed.

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.)

**Scholastic Probation Policy:** NCAHS exists for students who demonstrate a commitment to its educational program. In order to be promoted to the next grade, students must earn the minimum vocational credits each year, as indicated in the chart above.

A student who fails one agricultural course during the school year, will be placed on scholastic probation. A student on scholastic probation must earn all remaining vocational credits for that school year.

**Graduation Policy:** Requirements for graduation from NCAHS are based upon the successful completion of required courses and minimum credit requirements for each year:

Minimum Academic Requirements:	Minimum Vocational Requirements:
4 years of English	Grade 9 – 6.0 credits
3 year of Mathematics	Grade 10 – 7.5 credits
3 Years of Social Studies	Grade 11 – 10.5 credits
2 Years of Science	Grade 12 – 10.5 credits
4 Years of Wellness/Physical Education	

**Seniors Please Note:** All seniors must take a minimum of 9 academic credits and pass 7.5 credits and also pass 7 of 8 vocational courses in order to be eligible for a diploma and participate in the graduation ceremony and commencement exercises.

**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.

# ADMISSIONS STANDARDS FOR THE MASSACHUSETTS STATE COLLEGES AND UNIVERSITY

## **Introduction:**

In December, 1995, The Massachusetts Board of Higher Education adopted higher admissions standards for the Commonwealth's four-year public institutions. These institutions include:

Bridgewater State College  
Fitchburg State College  
Framingham State College  
Massachusetts College of Art  
Massachusetts Maritime Academy  
Massachusetts College of Liberal Arts  
Salem State College  
Westfield State College  
Worcester State College  
University of Massachusetts Amherst  
University of Massachusetts Boston  
University of Massachusetts Dartmouth  
University of Massachusetts Lowell

## **MINIMUM ADMISSIONS REQUIREMENTS**

The admissions standards for the state colleges and UMass emphasize a strong academic high school background so that students enter college ready to learn. These standards represent minimum requirements; meeting them does not guarantee admission, since campus officials consider a wide range of factors in admissions decisions. Students shall have fulfilled all requirements for the high school diploma or its equivalent upon enrollment. *It is important to note that admissions standards for the state's community colleges differ. Community colleges may admit any high school graduate or GED recipient.*

### **Freshman Applicants**

The new admissions standards for freshmen applicants have three main parts:

1. 16 required academic courses;
2. a minimum required grade point average (GPA) earned in college preparatory courses completed at the time of application; and
3. applicants must also submit an SAT or ACT score.

### **Academic Course Requirements**

Sixteen college preparatory courses distributed as follows are required. (A course is equivalent to one full school year of study. Courses count toward the distribution only if passed.)

- |                      |           |
|----------------------|-----------|
| 1. English           | 4 courses |
| 2. Mathematics       | 3 courses |
| 3. Sciences          | 3 courses |
| 4. Social Sciences   | 2 courses |
| 5. Foreign Languages | 2 courses |
| 6. Electives         | 2 courses |

**Minimum Required Grade Point Average (GPA)**

The GPA must be achieved based on all college preparatory courses completed at the time of application and should be weighted for accelerated (Honors or Advanced Placement) courses. Effective Fall 2001, the required minimum weighted high school GPA is 3.0 for the four-year public campuses based on a 4.0 scale.

Parents and students should be aware that grades from the Norfolk County Agricultural High School are translated to State College and University Standards, and a 3.0 grade point average at NCAHS does not necessarily mean that the translated GPA will remain the same.

**Minimum Grade Point Average (GPA)**

The new minimum weighted GPA for admission to state colleges and for the University of Massachusetts is 3.0. This is calculated at the end of the seventh semester and must be achieved based on all college preparatory courses completed at the time of application and is weighted for accelerated (honors, Advanced Placement, etc.,) courses.

**SAT Scores**

Applicants must submit SAT or ACT test scores for consideration if they are applying to a state college or UMass within three years of high school graduation.

**Sliding Scale (used when GPA is lower than the minimum required GPA)**

If an applicant's GPA falls below the required minimum, a sliding scale will apply. This scale should be used only when an applicant's GPA falls below the required 3.0 minimum for admission to the state colleges or UMass.

**Sliding Scale for Freshman Applicants to UMass**

<b>GPA</b>	<b>SAT Must Equal or Exceed</b>	<b>ACT Must Equal or Exceed</b>
2.51-2.99	950	20
2.41-2.50	990	21
2.31-2.40	1030	22
2.21-2.30	1070	23
2.11-2.20	1110	24
2.00-2.10	1150	25

**\*Effective fall 2000, no applicant with a high school GPA below 2.00 may be admitted to a state college or university campus.**

**Sliding Scale for Freshmen Applicants to a State College**

<b>High School GPA</b>	<b>SAT Must Equal or Exceed</b>	<b>ACT Must Equal or Exceed</b>
<b>2.51-2.99</b>	<b>920</b>	<b>19</b>
<b>2.41-2.50</b>	<b>960</b>	<b>20</b>
<b>2.31-2.40</b>	<b>1000</b>	<b>21</b>
<b>2.21-2.30</b>	<b>1040</b>	<b>22</b>
<b>2.11-2.20</b>	<b>1080</b>	<b>23</b>
<b>2.00-2.10</b>	<b>1120</b>	<b>24</b>

## **Transfers from Massachusetts Community Colleges**

Massachusetts Community Colleges and each of the University and State College campuses participate in a Joint Admissions program through which Community College graduates from designated transfer programs with a 2.5 or higher GPA are guaranteed admissions to a University or State College. To participate, students should sign up for the Joint Admissions program when they enroll at their Community college.

## **Vocational-Technical Student Applicants**

Vocational-technical students must complete 16 college preparatory courses, distributed in the same manner and with the same minimum grade point averages required of other high school graduates, with the following exceptions:

1. Two vocational-technical courses may be used to fulfill the two required electives.
2. Vocational-technical high school graduates who do not complete the two required college preparatory foreign language courses must complete an additional elective college preparatory course, for a total of three such courses, and satisfy *one* of the following options:
  - Complete at least one Carnegie unit of foreign language;
  - Complete a fourth Carnegie unit of mathematics or science, which need not be a laboratory course; or
  - Complete one Carnegie unit of computer science.

*Note: A Carnegie unit represents a full academic year of study or its equivalent in a specific subject.*

This requirement will remain in effect until the MA Department of Elementary and Secondary Education (MADESE) implements its requirements regarding foreign language study for vocational-technical students. At that time, vocational-technical applicants for admission to UMass and the state colleges will be required to meet MADESE requirements for foreign language study.

## **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
- 3 years of Social Sciences

Additionally, students may complete one or more of the following (depending upon the number of courses taken in the list above) in order to meet the 16 Carnegie Unit Requirement:

- Animal Anatomy and Physiology and Animal Genetics and Nutrition
- Marine Biology and Marine Life
- Plant Health Care and Plant Materials

Students should consult school counselors for specific information regarding these admissions standards.

## **COLLEGE TESTING PROGRAM**

Students interested in attending college should plan on taking one or more of the college entrance tests that are described below. The Norfolk County Agricultural High School is a test site for the PSAT only, students taking the SAT, SAT II and/or ACT, will need to identify a test site near to their homes when registering for these assessments. Most colleges accept either SAT or ACT scores. Students should work with their school counselors to determine which assessments are best for them.

### **PSAT/NMSQT**

This is a test given at our school in early October. It is intended for 11<sup>th</sup> graders who plan on attending college and is developed by the College Board as a practice test for the SAT and a means to enter the National Merit Scholarship Corporation scholarship competition. Selected 10<sup>th</sup> graders are offered the opportunity to take this test on a space available basis. Registration information regarding the PSAT is distributed at school in September.

### **SAT**

The SAT is a critical reading, writing and mathematics test which assists high schools, colleges, universities and scholarship programs in their evaluation of student's preparation for college. This test compares reasoning and academic strengths with those of approximately two million students each year. It is required by most four-year colleges and universities. The test can be taken anytime, but it is recommended in the spring of 11<sup>th</sup> grade and the fall of 12<sup>th</sup> grade.

### **SAT II**

The SAT II subject tests measure student's knowledge and skills in a specific subject and their ability to apply that knowledge. SAT II subject tests can be taken at the end of any year in a particular subject (such as Biology). Students should take the SAT II subject tests if they are required by certain colleges and universities, or if they plan on applying to very selective colleges.

### **ACT**

The ACT assessment measures college readiness skills in English, mathematics, reading and science. Scores are compared to other students who have taken the assessment. This assessment tends to be more subject oriented than the SAT, but is not offered as often as the SAT or in as many locations.

Information about these college testing programs is available in the Student Services Office and on line at [www.collegeboard.com](http://www.collegeboard.com) and [www.act.org](http://www.act.org). Students are strongly encouraged to practice at home or on line prior to taking the tests. Students must bring a calculator and 2 number two pencils to the test sites.

## **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 Student Success Plans and/or 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 Student Services Office.

## **TECH PREP**

Tech Prep is a federally funded program which provides grants to educational consortiums for the purpose of assisting students to explore educational opportunities beyond high school. It provides students with the chance to participate in a wide range of activities that can act as a stepping stone to continuing their education.

Some Tech Prep activities include field trips to local colleges, visits to college fairs and tours of college programs that may interest NCAHS students.

## **NCAHS STUDENT HOMEWORK/STUDY POLICY**

Recognizing that research indicates a positive correlation between increased time on homework and higher proficiency scores, NCAHS has developed the following homework policy for students. Homework in this instance refers to work assigned by a teacher to be completed outside of class time. This work is not limited to that which can be written, but can include for example, other types of work such as studying, conducting research, developing projects or working with an animal. It is our belief that homework serves many purposes:

- To improve academic and vocational performance
- To help students organize their time
- To extend learning and critical thinking beyond the school day
- To develop individual responsibility, decision making skills and independence
- To provide additional time for the application of new skills
- To keep parents involved and informed about the curriculum and skills being developed
- To enhance grades

As the effectiveness of any policy depends upon the cooperation of all concerned, the following responsibilities are stated:

### **Students:**

- Record assignments daily (use of an agenda book/homework notebook or daily planner is strongly suggested).
- Gather materials necessary for the completion of the assignment.
- Ask for clarification or help if assignment is not understood.
- Complete assignments on time.
- Should expect an average of ½ hour of homework per class, per night. Homework may consist of written assignments, reading, study for quizzes and tests, practice, or work on long term projects or assignments.
- Plan adequate time for long term assignments.

### **Teachers:**

- Provide a thorough explanation of how to do an assignment.
- Acknowledge each assignment in some way (such as comment upon, grade, check off, etc.).
- Vary the types of assignments given.
- Ensure that homework assignments are meaningful.
- Provide ample time for long term assignments throughout the school year.
- Communicate consequences for not completing homework to the students and parents.
- Communicate the value of homework assignments or the percentage homework contributes to the overall grade.

### **We ask for parental cooperation with the following:**

- Establish homework as a priority.
- Communicate with the teacher if there is a question about the homework.
- Foster pride in completed tasks.
- Provide a quiet place, adequate time and materials to complete assignments. Watching TV, allowing telephone interruptions or listening to music should be avoided while doing homework.
- Assist the student in managing their time outside of school to ensure enough time is allowed to complete homework.
- Encourage consistent daily routine.
- If a student says that assignments are completed, see that the time is devoted to reading, reviewing, or other academic pursuits.
- Support consequences when homework is not completed.

## **OVERVIEW OF FOUR YEARS AT NCAHS**

### **GRADE 9**

All 9th grade students are required to take the four academic courses aligned with the content areas of the state MCAS test. As a result, 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 three 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, and Plant 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 vo-ag program interest areas.

### **THE 9TH GRADE PROGRAM**

#### **MORNING**

English  
Mathematics  
Science  
Social Studies

\* See the academic program offerings for course options in each of these subject areas  
(Page 17)

#### **AFTERNOON**

Animal Science I  
Plant Science I and II  
Introduction to Mechanical Technology I and II  
Computer Applications I  
Introduction to Wellness I/Physical Education  
Career Orientation

## **GRADE 10 PROGRAM**

All 10<sup>th</sup> grade students are required to take the four academic courses aligned with the content areas of the state curriculum frameworks. As a result, 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 agricultural experiences in one of the following three areas: Animal and Marine Science, Diesel and Mechanical Technology or Plant and Environmental Science. In addition, students choose two elective courses outside of their specific area of interest to support a continued exploratory experience.

### **MORNING**

#### **Animal & Marine Science:**

**Required Courses:** Canine, Feline and Veterinary Science  
Dairy, Livestock and Equine Science  
Small Animal & Marine Science  
Herpetology and Avian Science  
Introduction to Wellness II / Physical Education  
Career Planning  
Computer Applications II

#### **Elective Courses (Choose two from the list):**

Natural Resources and the Environment  
Forestry  
Horticulture  
Landscape Operations  
Woodworking  
Equipment Operations  
Mechanical Technology  
Welding

#### **Diesel & Mechanical Technology:**

**Required Courses:** Woodworking  
Equipment Operations  
Mechanical Technology  
Welding  
Introduction to Wellness II / Physical Education  
Career Planning  
Computer Applications II

#### **Elective Courses (Choose 2 from the list):**

Natural Resources and the Environment  
Forestry  
Horticulture  
Landscape Operations  
Canine, Feline and Veterinary Science  
Dairy, Livestock and Equine Science  
Small Animal and Marine Science  
Herpetology and Avian Science

## **Plant & Environmental Science:**

**Required Courses:** Forestry  
Horticulture  
Landscape Operations  
Natural Resources and the Environment  
Computer Applications II  
Introduction to Wellness II / Physical Education  
Career Planning

### **Elective Courses (Choose 2 from the list):**

Canine, Feline and Veterinary Science  
Dairy, Livestock and Equine Science  
Herpetology and Avian Science  
Small Animal and Marine Science  
Mechanical Technology  
Welding  
Woodworking  
Equipment Operations

### **AFTERNOON**

English  
Mathematics  
Science  
Social Studies

\* See the academic program offerings for course options in each of these subject areas (Page 17)

## **GRADE 11 PROGRAM**

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 from Animal and Marine Science, Plant and Environmental Science or Diesel and Mechanical Technology. Within each of the vocational program majors, NCAHS students may choose to concentrate on specific interest areas. These interest areas are explained within the information that accompanies the vocational programs. (Please refer to pages 31-50.)

Compatible with career preparation, 11th grade students who are in good standing may elect to participate in an approved Cooperative Education Program (COOP) beginning the day after Memorial Day in the fourth marking term. COOP applicants must meet all criteria as listed starting on page 50.

### **MORNING**

Each student takes vocational agriculture courses aligned with selected interest areas. Please refer to the section entitled “The Vocational Agriculture Program” on page 31 for specific vo-ag course offerings, in addition to:

Fitness and Wellness for Life I  
Career Development

### **AFTERNOON**

English  
Mathematics  
Social Studies  
Science (Elective)  
Computer Applications (Elective)

\* See the academic program offerings for course options in each of these subject areas  
(Page 17)

## **THE 12TH GRADE PROGRAM**

The 12th grade at NCAHS is appropriately directed toward successful completion of the high school program. Students will be advised regarding appropriate academic course work required to achieve a high school diploma. In addition to the focus on graduation, seniors will be advised and assisted in preparation for related careers or college admission.

Vocational courses and lab work are focused on program majors and special interest areas.

A second year of Cooperative Education (COOP) is offered to eligible seniors in the fourth marking term. COOP applicants must meet all criteria as listed starting on page 50.

Exit portfolios that provide evidence of knowledge attainment and vocational skills are required of all seniors. The Agricultural Business Management Course, required for all 12th grade students, provides advice and direction in completing the senior portfolio.

### **MORNING**

English  
Mathematics  
Science (Elective)  
Social Studies (Elective)  
Computer Applications IV (Elective)

### **AFTERNOON**

Each student takes vocational agriculture courses aligned with selected interest areas. Please refer to the section entitled “The Vocational Agriculture Program” on page 31 for specific vo-ag course offerings, in addition to:

Fitness and Wellness for Life II  
Agricultural Business Management

## **THE ACADEMIC PROGRAM**

## **THE ENGLISH PROGRAM**

### **(1110) Freshman English (Grade 9)**

This literature based course is designed to develop reading and writing skills as well as grammar and vocabulary study. Students taking this course are generally reading at or above grade level. Instruction encourages critical reading and thinking, with assignments that are challenging and lengthy. Oral and written responses are a regular component of this course. This course is designed to promote success on the MCAS with emphasis on vocabulary, composition and literary analysis. Completion of a research paper is a requirement in the freshman year.

### **(1120) Freshman English (Grade 9)**

This literature based course is designed to develop techniques for reading and writing more effectively, and to promote proficiency in vocabulary and grammar. This course curriculum is intended to promote success on the MCAS. Completion of a research paper is a requirement in the freshman year.

### **(1210) Sophomore English (Grade 10)**

This literature based course continues grade 9 skill development with a more focused emphasis on analyzing literature and improving essay writing. Instruction is designed to help at or above grade level students practice and refine their reading, writing, speaking and critical thinking skills, including enrichment and review units in vocabulary and grammar. 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. This course is designed to promote success on the MCAS with emphasis on vocabulary, composition and literary analysis. A term paper may be assigned.

### **(1220) Sophomore English (Grade 10)**

This literature based course continues the skill development emphasized in grade 9. 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. This course is designed to promote success on the MCAS.

### **(1310) Contemporary Literature (Grade 11)**

This literature based course will give students the opportunity to explore significant thematic areas in contemporary literature. Students taking this course should be reading above grade level. Instruction is designed to encourage 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 literary 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. A term paper may be assigned.

### **(1320) Contemporary Literature (Grade 11)**

This literature based course places emphasis on literary selections that promote the improvement of reading, writing, speaking and listening skills through thematic units. Instruction is designed to continue to develop proficiency in literary analysis, composition, vocabulary, and grammar skills. Oral and written responses are a regular component of the class. PSAT/SAT preparation is included as part of the curriculum.

**(1410) American Literature (Grade 12)**

This course is a chronological study of American Literature from colonial times to the early nineteenth hundreds. It is a focused study on the literary merit, impact, and historical significance of some of the greatest American authors. Reading assignments will be challenging and sometimes lengthy. Vocabulary development exercises will be extensive and intended to enrich composition skills. Writing assignments and projects will require in-depth literary and critical analysis.

**(1420) Major Literary Works (Grade 12)**

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 influences through critical thinking and analytical writing activities. Writing assignments are designed to promote composition skills in preparation for post-secondary education.

## **THE MATHEMATICS PROGRAM**

### **(2110) Algebra I (Grade 9)**

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-83 Plus* graphing calculator.

### **(2120) Algebra I (Grade 9)**

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-83 Plus* graphing calculator.

### **(2115) Algebra II (Grade 9)**

This course continues the study of algebra as a problem solving tool. The series begins by reviewing the foundation of algebra: polynomials, operations, graphing and equations. The course then progresses to functions of all types: linear, polynomial (including quadratic) and rational. Also included are matrices and determinants, imaginary numbers, sequences and series, logarithms and trigonometry. Students are required to have a *TI-83 Plus* graphing calculator.

Prerequisite(s): Algebra I and teacher recommendation

### **(2205) Geometry (Grade 10)**

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-83 Plus* graphing calculator.

Prerequisite(s): Algebra II and teacher recommendation

### **(2210) Geometry (Grade 10)**

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-83 Plus* graphing calculator.

Prerequisite(s): Algebra I and teacher recommendation

### **(2220) Geometry (Grade 10)**

This course contains the same subject matter as 2210 above but uses an informal approach. An emphasis is placed on hands-on projects, computer simulations and real world applications. Students are required to have a *TI-83 Plus* graphing calculator.

Prerequisite(s): Algebra I

### **(2301) Pre-Calculus (Grade 11)**

Pre-Calculus offers students a concise review of algebra and trigonometry concepts, as well as strong preparation for calculus. This course emphasizes the algebra of calculus using a highly visual approach including graphing calculators. Students are required to have a *TI-83 Plus* graphing calculator.

Prerequisite(s): Algebra II (2105) and Geometry (2205)

### **(2310) Algebra II (Grade 11)**

This course continues the study of algebra as a problem solving tool. The series begins by reviewing the foundation of algebra: polynomials, operations, graphing and equations. The course then progresses to functions of all types: linear, polynomial (including quadratic) and rational. Emphasis is placed on algebraic skills and their relationship to the real world. Students are required to have a *TI-83 Plus* graphing calculator.

Prerequisite(s): Geometry (2210) or (2220) Geometry with teacher recommendation

### **(2320) Algebra II (Grade 11)**

This course continues the study of algebra as a problem solving tool. Traditional college preparatory content is included: Polynomials, Operations, Graphing and Equations. Emphasis is placed upon algebraic skills and their relationship to the real world. Students are required to have a *TI-83 Plus* graphing calculator.

Prerequisite(s): Geometry (2210 or 2220)

### **(2405) Calculus (Grade 12)**

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-83 Plus* graphing calculator.

Prerequisite(s): A final grade of 80 or above in Precalculus (2301) or teacher recommendation

### **(2425) Introduction to College Algebra (Grade 12)**

Opening with an SAT review, this course provides an in-depth review of the topics in algebra and an introduction to college level algebra. It is required that students have a *TI-83 Plus* graphing calculator for this course.

### **(2401) Pre-calculus (Grade 12)**

This course stresses the interrelationship between algebra and trigonometry, statistics and probability and other branches of mathematics. It encourages logic and critical thinking skills. A *TI-83 Plus* graphing calculator is required.

Prerequisite(s): Algebra II (2310) or teacher recommendation

### **(2424) Accounting (Grade 12)**

Accounting is the structure that provides businesses with a mechanism to record financial transactions and generate reports that give owners and investors a picture of the financial health of the organization. This class will cover the vocabulary of accounting, along with the correct method for recording various business transactions. Analysis of financial statements will also be stressed. Computer applications will be incorporated into the course to reinforce the transaction and statement creation process. This is a one semester elective course.

### **(2422) Introduction to Statistics (Grade 12)**

Simple probability theory will be explored leading to a study of the normal distribution. Descriptive statistics, including measures of central tendency and common graphing techniques will be covered. Sampling techniques and data analysis will be experienced first-hand through project work. It is required that students have a *TI-83 Plus* graphing calculator. This is a one semester elective course.

**(2423) Finite Mathematics (Grade 12)**

Finite mathematics covers many topics with real world applications. In this course, students will explore such topics as voting systems, graphs and networks, exponential growth, set theory, and linear programming. It is required that students have a *T1-83 Plus* graphing calculator. This is a one semester elective course.

## THE SCIENCE PROGRAM

### **(3111/3121) Biology I (Grade 9)**

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 connection to the real world.

### **(3211/3221) Chemistry (Grade 10)**

This course incorporates concepts and terminology with lab skills, accessing information, and agricultural applications. Students will utilize qualitative approaches to predict outcomes, identify unknowns and improve percent yield. Written conclusions in the form of lab reports are required. Use of a calculator is encouraged. This course is intended for students who need four years of science for college admission.

Prerequisite: Biology (3111/3121)

### **(3310/3320) Chemistry (Grade 11)**

This course incorporates concepts and terminology with lab skills, accessing information, and agricultural applications. Students will utilize qualitative approaches to predict outcomes, identify unknowns and improve percent yield. Written conclusions in the form of lab reports are required. Use of a calculator is encouraged.

### **(3311/3321) Physics (Grades 11) or (3401) Physics (Grade 12)**

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 and light.

Prerequisite(s): Pre-calculus (2415) in Grade 11 or concurrent with Pre-calculus or recommendation by student's math teacher

### **(3415) Biology II/Human Anatomy and Physiology (Grade 12)**

This course covers the external and internal structures of the human body and the physical relationships between 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 an important aspect of this course.

Prerequisite: Biology I and Chemistry

### **(3420) Chemistry (Grade 12)**

This course incorporates concepts and terminology with lab skills, accessing information and agricultural applications. Students will utilize qualitative and quantitative approaches to predict outcomes, identify unknowns and improve percent yield. Written conclusions in the form of lab reports are required. Use of a calculator is encouraged.

## **THE SOCIAL STUDIES PROGRAM**

### **(4111) World History II (Grade 9)**

This course provides a thematic study of the world from the 17<sup>th</sup> to the 20<sup>th</sup> century. An emphasis will be placed on an independent research project on a historical/social event that the instructor will detail throughout the year. Students will be required to complete two outside readings.

### **(4121) World History II (Grade 9)**

This course involves a thematic study of the world from the 17<sup>th</sup> to the 20<sup>th</sup> century. Teachers emphasize themes such as revolutions, world conflicts, imperialism, colonialism, governments and ideologies and the contemporary world.

### **(4211) United States History I (Grade 10)**

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 the era of 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 be required to complete two outside readings.

### **(4221) United States History I (Grade 10)**

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 the era of reconstruction. Teachers will emphasize colonialism, the Revolutionary War, the founding documents, the reforming of American society, westward expansion, the Civil War and reconstruction.

### **(4311) United States History II 20th Century (Grade 11)**

This course presents a chronological examination of the social and historical events from the Industrial Age to the United States in today's world. 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 three outside readings and a comprehensive midterm and final will be given.

### **(4321) United States History II 20th Century (Grade 11)**

This course presents a chronological examination of the social and historical events from the Industrial Age to the United States in today's world. Teachers will emphasize immigration, urbanization, progressivism, industrial expansion, organized labor, both world wars, the great depression, the New Deal, post war America, and recent presidential administrations and current events.

### **(4421) Principles of Economics (Grade 12)**

This course presents the study of how humankind satisfies its many material wants and needs. The ten principles of economics, supply/demand, social welfare, and the principles of micro and macro economics will be emphasized. The study of economics will help students understand the world in which they live, help students to become more astute participants in the economy and assist students in understanding the potential and limits of economic policy.

**(4422) Genocide in the Modern World (Grade 12)**

This course presents a chronological study of genocide in the 20th century. The causes and effects that genocide had on local populations will be emphasized. Students will learn about the ladder of hate and what causes genocide to happen. Topics of study will include Armenia, Nazi Germany, Cambodia, Rwanda and Darfur. Students will be required to complete two outside readings and complete at least one independent research project on an event that the instructor will emphasize throughout the course of the year.

**( 4423) Eyes on American Culture—**

**American Cinema in History and English Language Arts (Grade 12)**

*Eyes on American Culture* will use film to study, analyze, and learn about American culture and society. This course will focus on critical thinking skills, writing, and communication. Additional emphasis will be placed upon significant historical events, literary appreciation, and the understanding of how films represent American society.

# **THE WELLNESS AND PHYSICAL EDUCATION PROGRAM**

NCAHS recognizes that changing patterns of disease, death and dysfunction are shifting from communicable disease to life style choices such as diet, fitness/exercise, stress management and relationships. 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 11<sup>th</sup> and 12<sup>th</sup> grade students take one semester of Fitness & Wellness, which meets once in a four day cycle .

## **(5110) Freshman Physical Education (Grade 9)**

All students are required to change into 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 heart rate monitors and fitness report cards.

## **(5130) 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 Nutrition, RAPP (Responsible Attitudes Towards Pregnancy Prevention), Bullying and Harassment and Addictive Behaviors.

## **(5210) Sophomore Physical Education (Grade 10)**

All students are required to change into appropriate clothing and participate in Physical Education. The program offers each student experiences in a wide range of sport, fitness, and self-challenging activities for a lifetime of participation in physical activities.

## **(5230) 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 Addiction, Fitness and Nutrition, Non-Communicable Diseases and First Aid and CPR.

## **(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. In the Fitness Center students will be required to develop a program that challenges them to work towards their individual fitness goals. Each student, with the help of their instructor, will monitor their progress towards enhancing their personal level of fitness. 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. In the Fitness Center students will be required to continue to develop a program that challenges them to work towards their individual fitness goals. Each student, with the help of their instructor, will monitor their progress towards enhancing their personal level of fitness. This class will also include a wellness component, emphasizing health enhancing behaviors throughout life.

## **CAREER AND AGRIBUSINESS PROGRAM**

### **(6900) Career Orientation (Grade 9)**

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.

### **(6901) Career Planning (Grade 10)**

This sophomore course further develops a student’s career plan, and includes lessons from the *Career Cruising* website ([www.careercruising.com](http://www.careercruising.com)). The OSHA 10 Hazard Recognition Program is introduced as part of the student’s safety training. 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.

### **(6811/9811) Career Development (Grade 11)**

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.

### **(6911/9911) Agricultural Business Management (Grade 12)**

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 and will complete a senior exit portfolio containing evidence of their individual skills, talents and vocational abilities. Focus will also be placed upon money management, insurance, acquiring loans and personal finances. Students will also explore elements of entrepreneurship, marketing and sales.

# **TECHNOLOGY**

The courses and programs that appear in this section are specifically designed to support the core requirements for graduation, employment and career readiness.

## **(6120) Computer Applications I (grade 9)**

Students learn to utilize Microsoft programs, which include Microsoft Word for the formatting of reports, Microsoft PowerPoint for presentations, and Microsoft Excel for spreadsheets. Additionally, there is an introduction to Internet research and Internet safety.

## **(6220) Computer Applications II (grade 10)**

This course places a strong emphasis on Word Processing for the formatting of personal letters. Microsoft Access for databases is introduced. The course elaborates on Internet research and techniques and Internet safety. Excel is used to create graphs.

## **(6341) Computer Applications III Skills Lab**

The Computer Applications Skills Lab consists of learning modules designed to be completed in four-week blocks. Consideration will be given to students who want to concentrate on a particular unit of study for an additional period of time. Applications will be relevant to an agricultural high school curriculum, and address the needs of students continuing their education.

## **(6342) Computer Applications IV Skills Lab**

The Computer Applications Skills Lab consists of learning modules designed to be completed in four-week blocks. Consideration will be given to students who want to concentrate on a particular unit of study for an additional period of time. Applications will be relevant to an agricultural high school curriculum, and address the needs of students continuing their education.

**Learning Modules:** Keyboarding, Advanced Word Processing, Advanced Excel, Data Entry, Internet Research, Desktop Publishing and Digital Photography.

# 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 the Director of Student Services and Academic Curriculum Coordinator prior to application to determine if they meet the eligibility requirements.

Eligibility Requirements:

- a) Passing score on the MCAS
- b) Minimum grade point average of 2.5
- c) Any other eligibility requirement set forth by the college or university offering the dual enrollment credits

Students who meet the requirements are eligible to supplement/replace their high school educational program with college courses when these are appropriate. Students may qualify for the following dual enrollment options:

1. The courses are in addition to regularly scheduled courses and are offered in the afternoon and evening at local state colleges and community colleges. Grades received from dual enrollment 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 an existing NCAHS course. In this case, the student may, if appropriate, be excused from their high school class. The proposed college course must be approved and the appropriate Academic or Vocational coordinator must recommend the student for participation. The grade 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 have a grade point average of 3.5 and be in the top 10% of their class. In addition, their academic and agricultural department head 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 the 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 OPPORTUNITIES

## Spanish Courses

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

The Dual Enrollment Program can offer courses through a variety of venues, and is based on the availability of annual grant funds. Listed below are the language courses NCAHS is proposing for next year:

### **(1500) Elementary Spanish I (grade 12)**

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 a 2.5 cumulative average, meet all other eligibility requirements and be recommended by their counselor.

### **(1505) Elementary Spanish II (grade 12)**

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 a 2.5 cumulative average, meet all other eligibility requirements, be recommended by their counselor and have successfully completed Elementary Spanish I.

**THE VOCATIONAL AGRICULTURE PROGRAM**

## **THE DIESEL AND MECHANICAL TECHNOLOGY PROGRAM**

The main purpose of the Diesel and Mechanical Technology Program is to prepare students to enter occupations or continue their education in equipment operations, repair and servicing and construction. Students are offered a varied curriculum that explores careers and provides specialized, hands-on training in the dynamic technology that drives the mechanics industry, today and into the future. Students will also round out their professional skills with training in management, computer applications, communications, mathematics and physics.

### **CORE COURSES**

#### **GRADE 9**

(8110/8120) Introduction to Mechanical Technology I and II

#### **GRADE 10**

#### **Required Courses:**

(8210) Woodworking  
(8220) Equipment Operations  
(8230) Mechanical Technology  
(8240) Welding

**\* Plus two electives from a carefully selected list of offerings from other departments**

#### **GRADE 11**

(8310) Metal Fabrication  
(8320) Heavy Equipment Operations  
(8330) Small Engines: Theory and Service  
(8340) Small Engine Equipment  
(8380) Facilities Repair & Construction  
(8360) Plumbing, Electrical & Electronics  
(8370) Power Mechanics  
(8811) Career Development (pg. 27)

#### **GRADE 12**

(8410) Welding Fabrication  
(8420) Hydraulics and CDL License Preparation  
(8430) Construction Systems  
(8460) Computer Aided Design (CAD)  
(8470) Wood Fabrication  
(8480) Diesel Engines & Hydraulics  
(8489) Facilities Repair & Construction  
(8490) Equipment Components  
(8510) Practical Electronics  
(8520) Four-Cycle Engine Certification  
(8681) Ornamental Wood Construction  
(8911) Agricultural Business Management (pg. 27)

## **DESCRIPTION OF DIESEL AND MECHANICAL TECHNOLOGY COURSES**

### **(8110/8120) Introduction to Mechanical Technology (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, lay out 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.

### **(8230) Mechanical Technology (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 landscaping, snow removal, excavating and other agricultural enterprises. An important component of the course includes laws, permits, and regulations pertaining to utilities, safety standards and the environment.

### **(8330) Small Engines: Theory and Service (Grade 11) or (8347) (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 trouble shooting and tune-up will also be learned with the safe and proper use of mechanics' tools and equipment.

**(8340) Small Engine Equipment (Grades 11) or (8447 Grade 12)**

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.

**(8350) Small Scale Construction (Grades 11) or (8459 Grade 12)**

This course prepares students to safely use a variety of hand and power woodworking tools. Students are trained to plan, prepare and interpret sketches and plans, and construct small projects that are useful in agricultural and natural resources disciplines. Such projects would include dog houses, wild duck boxes, window boxes, and bird houses.

**(8359) Plumbing, Electrical and Refrigeration (Grades 11) or (8457 Grade 12)**

This course instructs students in the proper methods of basic plumbing, electrical circuitry and refrigeration repair. The course is designed for students who need to maintain plumbing, electric and refrigeration equipment in greenhouses, kennels, barns and other buildings. Students will learn to diagnose problems, read equipment specifications and installation procedures, install basic fixtures and repair or replace malfunctioning plumbing, electrical and refrigeration components.

**(8360) Plumbing, Electrical and Electronics (Grade 11)**

This course instructs students in the proper methods of basic plumbing, electrical circuitry and electronics. Students will build plumbing, electrical and electronic projects that have parts lists, schematics and parts placement drawings. Students study diagnosis, troubleshooting, repair and maintenance of plumbing, electrical and electronic systems.

**(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 (Grades 11) or (8489 Grade 12)**

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.

**(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.

**(8420) Hydraulics and CDL License Preparation (Grade 12)**

This course builds on Heavy Equipment Operations. Emphasis is placed on the continued development of operational skills and excavating to grade and specifications. Material on hydraulics licensing and commercial drivers' licenses is covered.

### **(8430) Construction Systems (Grade 12)**

This course instructs students in drafting procedures and construction of agricultural facilities. Students will use drafting equipment, including computer aided design (CAD) software to design their own building plans.

### **(8460) Computer Aided Design (Grade 12)**

This introductory course will introduce students to micro-computer-based computer aided drafting system (CAD). Students will design simple views, isometric views and sections of views. Students will learn to store drawings to various scales. Drawings from various career fields will also be explored.

### **(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.

### **(8480) Diesel Engines and Hydraulics (Grade 12)**

This course prepares students to maintain, diagnose problems and repair diesel engines and hydraulic systems on farm tractors, as well as machinery, construction, and landscaping equipment.

### **(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 trouble-shooting, repair and maintenance of these components.

### **(8510) Practical Electronics (Grade 12)**

This course covers the basic principles of electronics. Students study diagnosis, troubleshooting, repair and maintenance of electrical and electronic systems. Through use of the A-Tech© system using laptop computers and demonstration labs, emphasis is placed on wiring diagram comprehension.

Prerequisite(s): Teacher recommendation

### **(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, trouble shooting and general repairs.

Prerequisite(s): Teacher recommendation

### **(8681) Ornamental Wood Construction (Grade 12)**

This course prepares students to safely use a variety of hand and power woodworking tools. Students are trained to plan, prepare, and interpret sketches and plans. Students construct small projects that are useful in floral design and natural resources disciplines. Such projects would include window boxes, birdhouse, trellises, holiday gifts and ornaments.

## **THE ANIMAL AND MARINE SCIENCE PROGRAM**

The main goal of the Animal and Marine Science Program is to prepare students for work and/or college in the fields of Animal and Marine Science. NCAHS courses are clustered so that each student has the opportunity to obtain the knowledge and skills necessary to work and/or continue their studies.

### **CORE COURSES**

#### **GRADE 9**

(9000) Animal Science I

#### **GRADE 10**

#### **Required Courses:**

(9220) Herpetology and Avian Science

(9250) Canine, Feline and Veterinary Science

(9260) Small Animal and Marine Science

(9270) Dairy, Livestock and Equine Science

**\* Plus two electives from a carefully selected list of offerings from other departments**

#### **GRADE 11 AND 12 INTEREST AREAS**

Canine Science

Equine Science

Farm and Livestock Management

Marine Science

Pet Shop Management

Lab Animal Technology

Veterinary Science

#### **REQUIRED COURSES FOR ALL INTEREST AREAS:**

Anatomy and Physiology  
Business Management (pg. 27)

Animal Nutrition and Genetics  
Career Development (pg. 27)

# ANIMAL AND MARINE SCIENCE

## COURSES WITHIN SPECIAL INTEREST AREAS

**Each student will be scheduled for 8 courses per year.  
Required courses for each interest area are listed below.**

### **PET SHOP MANAGEMENT**

#### **Grade 11**

(9300) Animal Anatomy and Physiology  
(9450) Canine Behavior and Health I  
(8350) Small Scale Construction  
(9811) Career Development (pg. 27)  
(9461) Marine Biology

#### **Grade 12**

(8489) Facilities Repair and Construction  
(8470) Wood Fabrication  
(9600) Animal Nutrition and Genetics  
(9621) Pet Shop and Aquarium Management  
(9911) Agricultural Business Mgmt. (pg. 27)

### **RESEARCH ANIMAL TECHNOLOGY**

#### **Grade 11**

(9300) Animal Anatomy and Physiology  
(9461) Marine Biology  
(9380) Veterinary Science I  
(9811) Career Development (pg. 27)  
(9570) Research Animal Biotechnology I

#### **Grade 12**

(9600) Animal Nutrition and Genetics  
(9680) Veterinary Science II  
(9911) Agricultural Business Mgmt. (pg. 27)  
(9870) Research Animal Biotechnology II

### **VETERINARY SCIENCE**

#### **Grade 11**

(9300) Animal Anatomy and Physiology  
(9570) Research Animal Biotechnology I  
(9450) Canine Behavior and Health I  
(9380) Veterinary Science I  
(9811) Career Development (pg. 27)

#### **Grade 12**

(9600) Animal Nutrition and Genetics  
(9680) Veterinary Science II  
(9911) Agricultural Business Mgmt. (pg. 27)  
(9790) Animal Behavior

### **CANINE SCIENCE**

#### **Grade 11**

(9300) Animal Anatomy and Physiology  
(9350) Canine Breeds and Handling  
(9450) Canine Behavior and Health I  
(9550) Grooming and Kennel Management I  
(9811) Career Development (pg. 27)

#### **Grade 12**

(9600) Animal Nutrition and Genetics  
(9650) Canine Behavior and Health II  
(9750) Grooming and Kennel Management II  
(9911) Agricultural Business Mgmt. (pg. 27)

### **EQUINE SCIENCE**

#### **Grade 11**

(9300) Animal Anatomy and Physiology  
(9340) Equine Science and Equitation I  
(9440) Equine Science and Equitation II  
(9470) Field and Forage Crops  
(9811) Career Development (pg. 27)

#### **Grade 12**

(9600) Animal Nutrition and Genetics  
(9640) Equine Management and Dressage  
(9740) Stable Management and Cross Country  
(9911) Agricultural Business Mgmt. (pg. 27)

## **MARINE SCIENCE**

### **Grade 11**

(8359) Plumbing, Electrical and Refrigeration  
(9300) Animal Anatomy and Physiology  
(9461) Marine Biology  
(9811) Career Development (pg. 27)

### **Grade 12**

(9600) Animal Nutrition and Genetics  
(9621) Pet Shop and Aquarium Management  
(9861) Marine Life  
(9911) Agricultural Business Mgmt. (pg. 27)

## **FARM AND LIVESTOCK MANAGEMENT**

### **Grade 11**

(8320) Farm Equipment Operations  
(9300) Animal Anatomy and Physiology  
(9375) Dairy and Beef Management I  
(9470) Field and Forage Crops  
(9811) Career Development (pg. 27)

### **Grade 12**

(9600) Animal Nutrition and Genetics  
(9675) Dairy and Beef Management II  
(9770) Livestock Management  
(9911) Agricultural Business Mgmt. (pg. 27)

### **Open electives:**

(9696) Zoo and Exotic Animals  
(9695) New England and North American Wildlife

## **DESCRIPTION OF ANIMAL AND MARINE SCIENCE COURSES**

### **(9000) Animal Science I (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.

### **(9270) Dairy, Livestock 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.

### **(9300) Anatomy and Physiology (Grade 11)**

This course introduces the student to the anatomy and physiology of domestic animals. Form and how it relates to function is studied. Practical and technical applications of the body's systems are demonstrated through the use of live animals, evaluations, guest speakers and classroom projects.

### **(9340) Equine Science and Equitation I (Grade 11)**

Horse gaits, movements and balanced seat equitation are presented in balance seat saddle. Students learn horse breeds, disciplines and history. Basic safety, care of the horse, stable and tack with hands-on experiences are stressed.

### **(9350) Canine Breeds and Handling (Grade 11)**

Students learn the basics of how to prepare, handle and show dogs. The student will study the canine breeds, the various uses of dogs, and the regulations and activities of the American Kennel Club.

### **(9375) Dairy and Beef Management I (Grade 11)**

This course involves raising dairy and beef cattle from calthood through to the first lactation. Herd health maintenance, calthood diseases, feeding, safety, breeding, calf care and herd management skills are covered. Animal selection, breeds and judging are included, along with the marketing of dairy and beef animals.

### **(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.

### **(9440) Equine Science and Equitation II (Grade 11)**

This course builds upon the management of horses and the horseback riding skills learned in Equine Science and Equitation I. Advanced grooming techniques and the care of horses, equine health and clothing and unsoundness are also included in this course. Jumping, course design and equitation are emphasized.

### **(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.

### **(9461) Marine Biology (Grade 11)**

This course introduces the student to oceanography; including tides, currents as well as properties of water. Students will learn about the issues facing aquaculture and fisheries. In addition, different marine species and their habitats will be explored; especially related to beaches, pollution and our environment.

### **(9470) Field and Forage Crops (Grade 11)**

Developing and maintaining pasture land, preparing land for crops, and the planting, culture and harvesting of animal food crops are studied in this course. Students will also learn about feed quality and pasture/forage crop selection, uses and identification. Practical applications include fencing systems, forage/soil testing, intense rotational grazing and equipment operations. Poisonous plants and weeds are also topics covered in this class.

### **(9570) Research Animal Biotechnology I (Grade 11)**

This course introduces the students to the regulations, research uses and common laboratory animals used in today's high paying biotechnology jobs. Students will learn basic biology, husbandry, facility operations and experimental techniques necessary for a career in Lab Animal Medicine. This course prepares students to take the first-level certification exams.

### **(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 is an essential part of the course. Practical application by grooming of medium- and short-hair dogs is done in the lab. The course introduces students to kennel management techniques.

### **(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 zoo and exotic species.

### **(9600) Animal Nutrition and Genetics (Grade 12)**

The process of digestion, metabolism and absorption and how they relate to feed management are covered in this course. Students will learn about animal feeds, the importance of balanced diets and different food categories. In the second half of the course, students discuss the basics of animal genetics, modes of inheritance, gene action and commonly inherited traits of domestic animals.

### **(9621) Pet Shop and Aquarium Management (Grade 12)**

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.

### **(9640) Equine Management and Dressage (Grade 12)**

Dressage, a method of horse riding devoted to developing harmony between the horse and rider, will be studied. Equine diseases, reproduction, basics of training, and tools of training, driving, and management skills will be covered.

### **(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.

### **(9675) Dairy and Beef Management II (Grade 12)**

The topics covered in this class include milking systems, cow management and lactation. Focus is placed on diseases of the lactating cow, record keeping and the production of dairy products. Beef production focuses on cow/calf care, handling, breeding and reproductive management and selection of stock. Lab activities include vaccinations, linear classification, clipping/fitting, marketing, safety, judging and sanitation.

### **(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, such as rabies 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.

### **(9740) Stable Management and Cross Country (Grade 12)**

Equine students will learn how to design and construct a cross country course, as well as ride a basic course over fences. Also included is a detailed study of stable management skills. Students will learn to work in and manage stables. Record keeping, care and feeding, first aid, customer relations, sanitation and safety are included.

### **(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.

### **(9770) Livestock Management (Grade 12)**

This course covers the raising of beef, sheep and swine for commercial use. Emphasis is placed on implementing a health program, use of performance data, and management decision making. Marketing, livestock selection, farm animal reproduction and the use of animal products are important components of this course.

### **(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.

### **(9861) Marine Life (Grade 12)**

Biology of the ocean will be the focus of this course. Students will learn the habitats, nutrition and anatomy of marine mammals, birds and reptiles. Other marine life including mollusks, crustaceans and echinoderms will also be discussed. Careers involving these species as well as the impact they have on our environment will be explored.

### **(9870) Research Animal Biotechnology II (Grade 12)**

This course builds on the concepts explored in Research Animal Biotechnology I. Students will gain advanced knowledge of the animals used in research. The areas of focus will be development and use of medical/scientific models, how to interact as part of the scientific team, and how to provide hands-on veterinary and scientific assistance to biomedical researchers. This course is specifically designed to prepare students for starting a career path in animal research and second-level certification exams.

## **THE PLANT AND ENVIRONMENTAL SCIENCE PROGRAM**

The main purpose of the Plant and Environmental Science Program is to prepare students to enter occupations and/or continue their education through the major interest areas listed below. Students are offered a varied curriculum that explores careers, presents technical and botanic knowledge and develops an awareness and appreciation of our natural resources.

### **CORE COURSES**

#### **GRADE 9**

(7110/7120) Plant Science I and II

#### **GRADE 10**

#### **Required Courses:**

(7205) Natural Resources and the Environment  
(7220) Forestry  
(7230) Horticulture  
(7240) Landscape Operations

**\* Plus two electives from a carefully selected list of offerings from other departments**

### **GRADES 11 AND 12 INTEREST AREAS**

Urban Forestry  
Floral Design  
Landscape Management  
Ornamental Gardening  
Environmental Technology  
Natural Resources Management

### **REQUIRED COURSES FOR ALL INTEREST AREAS:**

Botany and Soils  
Agricultural Business Management  
Career Development  
Plant Health Care  
Plant Materials

## PLANT AND ENVIRONMENTAL SCIENCE

### COURSES WITHIN SPECIAL INTEREST AREAS

**Each student will be scheduled for 8 courses per year.  
Required courses for each interest area are listed below.**

#### **URBAN FORESTRY**

##### **Grade 11**

(7521) Plant Materials I  
(7311) Plant Health Care  
(7321) Urban Forestry I  
(7322) Urban Forestry II  
(7313) Botany and Soils  
(6811) Career Development (pg. 27)

##### **Grade 12**

(7423) Urban Forestry III  
(7424) Urban Forestry IV  
(7522) Plant Materials II  
(6911) Agricultural Business Mgmt. (pg. 27)

#### **LANDSCAPE MANAGEMENT**

##### **Grade 11**

(7521) Plant Materials I  
(7313) Botany and Soils  
(7311) Plant Health Care  
(7363) Turf Management I  
(7381) Landscape Management I  
(7382) Landscape Management II  
(6811) Career Development (pg. 27)

##### **Grade 12**

(7621) Landscape Design I  
(7622) Landscape Design II  
(8447) Small Engine Equipment (pg. 34)  
(7522) Plant Materials II  
(7571) Turf Management II  
(6911) Agricultural Business Mgmt. (pg. 27)

#### **ORNAMENTAL GARDENING**

##### **Grade 11**

(7521) Plant Materials I  
(7311) Plant Health Care  
(7512) Flower Gardening  
(7313) Botany and Soils  
(7352) Greenhouse Management  
(6811) Career Development (pg. 27)

##### **Grade 12**

(7542) Interiorscapes  
(7522) Plant Materials II  
(7602) Greenhouse Crops  
(7621) Landscape Design I  
(7622) Landscape Design II  
(6911) Agricultural Business Mgmt. (pg. 27)

## **FLORAL DESIGN**

### **Grade 11**

(7342) Floral Design I  
(7481) Floral Design II  
(7313) Botany and Soils  
(7521) Plant Materials I  
(7311) Plant Health Care  
(7352) Greenhouse Management  
(6811) Career Development (pg. 27)

### **Grade 12**

(7542) Interiorscapes  
(7581) Advanced Floral Design I  
(7582) Advanced Floral Design II  
(7602) Greenhouse Crops  
(6911) Agricultural Business Mgmt. (pg. 27)

## **ENVIRONMENTAL TECHNOLOGY**

### **Grade 11**

(7521) Plant Materials I  
(7311) Plant Health Care  
(7561) Environmental Technology I  
(7562) Environmental Technology II  
(7313) Botany and Soils  
(6811) Career Development (pg. 27)

### **Grade 12**

(7480) OSHA  
(7522) Plant Materials II  
(7660) Contemporary Environmental Issues  
(6911) Agricultural Business Mgmt. (pg. 27)

## **NATURAL RESOURCES MANAGEMENT**

### **Grade 11**

(7521) Plant Materials I  
(7311) Plant Health Care  
(7301) Environmental Studies  
(7313) Botany and Soils  
(7330) New England Wildlife  
(6811) Career Development (pg. 27)

### **Grade 12**

(7450) Park Management  
(7522) Plant Materials II  
(7440) Resource Management  
(7460) Recreational Management  
(6911) Agricultural Business Mgmt. (pg. 27)

## **DESCRIPTION OF PLANT AND ENVIRONMENTAL SCIENCE COURSES**

### **(7110/7120) Plant Science I and II (Grade 9)**

This course is designed as a survey of the majors available in our Plant and Environmental Science Program. Students will develop skills that form a foundation for the study of biological 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.

### **(7205) 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.

### **(7220) 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.

### **(7230) Horticulture (Grade 10)**

Horticulture includes the cultivation, processing and sale of fruits, vegetables, ornamental plants and flowers. Students receive hands-on training in garden design, interiorscapes, planting, transplanting and greenhouse crops. Students will work with cut flowers, potted plants and flowering bulbs. They will develop a product and market the product for direct sale.

### **(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, identification of ornamental trees and shrubs, pruning, transplanting and landscape nursery production. Students will acquire equipment usage skills involving the farm tractor, skid steer and commercial mowers.

### **(7301) Environmental Studies (Grade 11)**

Environmental Studies is an analysis of our natural resources, conservation, waste management and recycling. 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.

### **(7311) Plant Health Care (Grade 11)**

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.

### **(7313) Botany and Soils (Grade 11)**

This Botany course is designed to give the student an in-depth experience in a botany laboratory. The students will develop an understanding of plants on the cellular level as well as investigating plant systems, their functions and ecosystems.

### **(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*.

### **(7330/7430) New England Wildlife (Grade 11)**

This course studies animal life from fish to mammals with special emphasis on game species. The natural history and habits of New England animals are presented and related to management techniques for various species. An appreciation of New England wildlife and its vital role in the environment is emphasized.

### **(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 of floral design in completing arrangements.

### **(7352) Greenhouse Management (Grade 11)**

Greenhouse Management is a 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 to properly grow flower crops. Students will learn how to propagate plants from cuttings and seed, handle soil mixes, grow potted plants and cut flowers and assist with maintenance of greenhouse structures.

### **(7363) Turf Management I (Grade 11)**

Turf Management I is devoted to the development of golf course management skills. Students will understand the basic layout of golf courses, discuss the responsibilities of the superintendent and other golf course employees and describe the maintenance practices performed on golf courses. Students will learn business management practices for the turf industry.

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

Landscape Management is a study of the principles and practices of grounds maintenance. Equipment selection and safe operation will be presented along with current trends in the landscape industry.

### **(7419/7429) Environmental Science (Grade 12)**

This course provides students with the scientific principles, theories, concepts, and methods required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human made. Students will develop a working knowledge of environmental issues and experience in solving environmental problems. Alternative approaches to environmental problems will develop critical thinking skills.

### **(7481) Floral Design II (Grade 11)**

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 and retailing skills. Lab classes will develop design skills using horticultural products.

### **(7512) Flower Gardening (Grade 11)**

Flower Gardening is a course which includes the identification, propagation and maintenance of annual bedding plants, herbaceous perennials 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.

### **(7561/7562) Environmental Technology I and II (Grade 11)**

Students learn about new developments involving environmental protection and control. Topics include water supply sources, wastewater treatment, and groundwater monitoring. Classroom activities will involve site assessments using computer data and maps, and legal and technical aspects of site restoration and mediation.

### **(7423) Urban Forestry III (Grade 12)**

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

### **(7424) Urban Forestry IV (Grade 12)**

Students will continue to practice the techniques covered in Urban Forestry III. They will explore the compartmentalization of decay in trees or C.O.D.I.T. There will be an introduction to electrical hazards and aerial rescue.

### **(7440) Resource Management (Grade 12)**

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

### **(7450) Park Management (Grade 12)**

Park Management prepares students to manage and use the natural resources that occur on, and in association with, public and private parks for human benefit. Students will study laws and regulations governing land use and their affect on the development and maintenance of local, state, and national parks. Course activities include taking field trips to local parks.

### **(7460) Recreation Management (Grade 12)**

Recreation Management is a course related to tourism and leisure time activities. Students will learn skills which include the development of nature trails, orienteering, map reading, wilderness survival, global positioning systems, camping, hiking, fishing, hunting, Nordic skiing and snowshoeing.

### **(7480) OSHA (Grade 12)**

OSHA prepares students for jobs as field and lab technicians, hazardous materials handlers, emergency response technicians, decontamination technicians, environmental educators, and other industry, government, and community positions. The class incorporates classroom and laboratory training, field trips and case studies of Environmental Protection Agency (EPA) Superfund sites. Upon completion of the course, students will receive certification under Occupational Safety and Health Administration's (OSHA) Hazardous Waste Operations and Emergency Response final rule (29 CFR 1910.120).

### **(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.

### **(7542) Interiorscapes (Grade 12)**

Interiorscapes is a study of the use of foliage and selected flowering plants in interior environments such as shopping malls, commercial buildings and private residences. Course work will include identification, care and maintenance of interior plants, as well as hands-on experience in the design and maintenance of interiorscapes in the school's buildings.

### **(7571) Turf Management II (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.

### **(7581/7582) Advanced Floral Design I and II (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 and retailing skills. Lab classes will develop design skills using horticultural products.

### **(7621/7622) Landscape Design I and II (Grade 12)**

Students design landscapes using drafting techniques necessary in landscape work including lettering, line work, scale drawings, elevations and profiles. Students will learn the design process including design principles, site analysis and working drawings. Students will also be introduced to state-of-the-art computer aided design (CAD) techniques.

### **(7630) Garden Design (Grade 12)**

Garden Design is an advanced herbaceous flower gardening course where students learn to design gardens using traditional drafting techniques, drawings, sketching and elevations. Students will focus on herbaceous garden development in residential and small commercial properties using traditional drafting equipment and computer-aided design technology.

### **(7660) Contemporary Environmental Issues (Grade 12)**

This course covers a broad area of environmental concerns and issues in the green industry. Subjects will include environmental health and safety regulations, chemical usage and other concerns in the business community.

## **COOPERATIVE EDUCATION PROGRAM (COOP)**

(7831/7931) Plant and Environmental Science  
(8831/8931) Diesel and Mechanical Technology  
(9831/9931) Animal and Marine Science

COOP is a program option for eligible students in grades 11 and 12 during the fourth and final marking periods of each school year. The COOP program is scheduled during vocational time only. Students are required to attend all of their academic classes. COOP provides an opportunity for upperclassmen to participate in a work-experience program related to their agricultural major. All conditions of employment are explained in the COOP manual and application packet.

An assigned staff member (the Director of Community and Cooperative Education or their designee) will engage in regular communication between the school and the employer throughout the duration of the COOP 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 Director of Community and Cooperative Education in consultation with the employer.

To be eligible for COOP, all of the following conditions must be satisfied:

- Passing grades for the year in all courses, including third term courses.
- A current and carefully prepared (typed) resume, cover letter and application on file with the Director of Community and Cooperative Education
- Approval of the placement and condition of employment by the Director of Community and Cooperative Education, which may include a teacher/department endorsement;
- A written agreement on business letterhead indicating the description of the work and all conditions of employment, along with the completed agreement form on file with the Director of Community and Cooperative Education.
- The minimum number of hours of work per week is 15 hours, and each COOP agreement must extend through the end of the student's school year;
- validation of the employer's workers' compensation insurance on file with the Director of Community and Cooperative Education;
- a satisfactory attendance and discipline record as determined by the Dean of Students;
- parental/guardian permission; and
- submission and completion of all COOP approval forms contained in the COOP Manual.